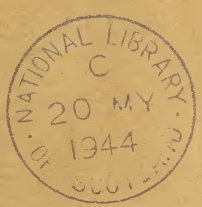
FOOD CONSUMPTION LEVELS

IN THE UNITED STATES, CANADA AND THE UNITED KINGDOM



LONDON: H.M. STATIONERY OFFICE: 1944
TWO SHILLINGS

ACKNOWLEDGMENTS

The Committee wishes to take this opportunity of expressing and placing on record its deep appreciation of the able assistance it has received in the carrying out of this enquiry from its Secretariat and from those responsible in Washington, Ottawa and the United Kingdom, for preparing and analysing the mass of diverse statistics required as a basis for the study.

In particular, the Committee wish to express their thanks to W. D. Stedman Jones and to the Machine Room of the Statistics and Intelligence Division of the Ministry of Food ; to Katherine Jacobson and to the Statistics Division of Requirements and Allocations Control in the War Food Administration ; to the staff of the Agricultural Branch, Dominion Bureau of Statistics, Ottawa ; to Alice M. Barter and Rosaline Canney of the Ministry of Food and to Maxine Enlow of the War Food Administration for their assistance in the secretarial work ; to Mary Macbeth of the Nutritional Service, Department of Pensions and National Health, Ottawa ; and to Frances Hall of the War Food Administration, Washington.

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Erratum : Page 19, Chart 3b :—

The graph headed "Tomatoes and Citrus Fruits" —the top line represents the United States consumption and should be thin, and the bottom line represents United Kingdom consumption and should be thick.

MINISTRY OF FOOD
April, 1944

FOOD CONSUMPTION LEVELS

IN THE UNITED STATES, CANADA AND THE UNITED KINGDOM

Report of a
SPECIAL JOINT COMMITTEE SET UP BY THE COMBINED FOOD BOARD

LONDON : H.M. STATIONERY OFFICE : 1944

[THIS REPORT IS ALSO PUBLISHED IN CANADA BY THE KING'S PRINTER, AND IN THE UNITED STATES AT THE GOVERNMENT PRINTING OFFICE.]

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To the COMBINED FOOD BOARD.

Hon. R. H. BRAND,
Head of British Food Mission,
Washington, D.C.,
United States.

Hon. MARVIN JONES,
War Food Administrator,
United States.

Hon. JAMES G. GARDINER,
Minister of Agriculture,
Canada.

November 23, 1943.

We submit herewith, in accordance with the instructions contained in the Terms of Reference of this Joint Committee, our final report on the enquiry we have made into food consumption levels in the United States, Canada and the United Kingdom. This report follows closely the lines of our interim report dated August 20, 1943; we did not find occasion to make any changes in technique or, except in the addition of material regarding Canada, in the broad conclusions reached in that report.

Dr. J. M. Cassels, who contributed largely to the interim report, ceased to be a member of the Committee on taking up a new appointment and therefore did not take part in the preparation of this final report. Three of our United Kingdom members—Mr. A. N. Duckham, Dr. J. C. Drummond and Mr. F. Hollins—were unable to attend our meetings in Ottawa and were therefore also unable to participate directly in its preparation but they were kept informed of the progress made and wish to associate themselves fully with this final report.

Yours respectfully,

UNITED STATES.	CANADA.	UNITED KINGDOM.
PAUL L. KOENIG.	H. F. ANGUS.	P. G. H. BARTER.
L. A. MAYNARD.	W. C. HOPPER.	F. NORTHAM.
MONTELL OGDON.	IAN MCARTHUR.	W. A. STUART WILLIAMS.
LLOYD G. REYNOLDS.	L. B. PETT.	
	ANNA SPEERS.	

INTRODUCTION

Origin and Conduct of Enquiry

1. A joint statement made in June, 1942, by the President of the United States and the Prime Minister of the United Kingdom declared that " in principle, the entire food resources of Great Britain and the United States will be deemed to be a common pool." It soon became apparent that this could only be done if more complete and comparable information were available on the rates of consumption in the countries concerned. Several estimates were made on an individual commodity basis by the Governments represented on the Combined Food Board and the London Food Committee. Early in 1943 it was recognised that, useful as these estimates had been, they were deficient in two respects ; firstly, there was no assurance that the bases of calculation used by the different Governments were entirely comparable, and secondly, it was possible that fallacious conclusions might be drawn as a result of comparing the consumption of individual commodities in isolation, instead of looking at the diet of each country as a whole. A more general comparison for the United Kingdom and the United States, in terms of eleven commodity groups and twelve nutritional elements, undertaken by the United States Food Distribution Administration, failed to overcome the first of these deficiencies, and only partially overcame the second.

2. Accordingly, in March, 1943, it was decided by the Combined Food Board that plans for a joint enquiry into the food consumption levels in the United States and the United Kingdom should be drawn up. To prepare an outline for the project and draft the terms of reference required, they appointed a joint staff group consisting of E. Twentyman and W. A. Stuart Williams from the British Food Mission, and John M. Cassels and Dr. Russel M. Wilder from the Department of Agriculture. At the 33rd Meeting of the Combined Food Board on May 3, 1943, the plans drawn up were adopted and a Committee of United States and United Kingdom experts was formally established to study and compare the pre-war, present and prospective food consumption levels of the two countries. At the same meeting it was formally decided to extend to the Canadian Government an invitation (which was subsequently accepted) to participate in this enquiry.

3. The **terms of reference of the Committee** (members of which would be nominated by the Administrator of the War Food Administration and the Minister of Food respectively in the case of the United States and United Kingdom) were as follows :

> " For the purpose of providing a working basis for the guidance of the Combined Food Board and of the appropriate Governmental agencies of the two Governments in the allocation of foods in short supply :
>
> to consider and compare the pre-war and present and prospective food consumption of the civilian populations of the United States and the United Kingdom ;
>
> to formulate an agreed basis for the measurement, and appraisal of the relative effects, of changes in the consumption of particular foods in the two countries ;
>
> to give due regard to differences, both permanent and temporary, in the habits and conditions of life and feeding of the populations concerned, and other relative circumstances."

The Committee was instructed to report as soon as possible in order to provide a working basis for current decisions.

4. In the terms of reference it was recognised that the work would fall under two main heads :

> " Part (I). *Supplies and Distribution* would be concerned with the development of the most complete and comparable information obtainable from the appropriate authorities of the countries concerned on the

quantities of all kinds of foodstuffs available or expected to be available for consumption. The enquiry would not of course be concerned with the operational policies and processes giving rise to the factual situation disclosed or envisaged by the information so obtained, whether in the field of agricultural production, transportation or overseas shipment. It would deal with total disappearance figures for food in each country, as well as ration allowances ; population estimates, including the breakdown into age groups and other significant classifications ; extent of employment and intensity of labour ; distribution of food among consumer groups in different areas and different income groups ; waste and losses occurring in the process of distribution ; distribution programmes and control techniques ; economies to be obtained through the shipping of larger proportions of some commodities and smaller proportions of others ; and other related matters.

Part (II). *Nutrition and Health*, would be concerned with comparative analyses of nutritional needs of populations under their respective conditions of life and work, the determination of the nutritive content of the *per capita* food supplies available in the different countries, and an evaluation of the effects of dietary changes that have taken place or which might be required. It would involve the establishment of appropriate coefficients for the conversion of commodity supply data into terms of nutritional elements ; comparisons of past and present patterns of consumption and appraisal of diets with respect to tastes and habits ; determination of commodities that have special significance because of their effects on the consumption of others ; evidence of nutritional conditions obtained from observations, surveys and reports ; evidence of consumer reactions ; and other similar matters."

In presenting its Report, the Committee considers it important to underline the following statement from the terms of reference :

" the statistical data and scientific knowledge available will probably be insufficient to provide a reliable basis for precise and detailed conclusions. They can be made much more accurate and useful than they are to-day, but there will always be limits to their validity and the greatest care must be taken in the interpretation of the results obtained. There are many peculiar difficulties involved in making international comparisons based on other considerations."

Procedure.

5. (*a*) As two members of the United Kingdom team attended the United Nations Conference on Food and Agriculture at Hot Springs, Virginia, some preliminary meetings were held in Washington before they left the United States, at which it was possible to agree upon the general programme of the work and on the statistical and scientific data which would be required. Full verbal statements were also received from the appropriate experts on the statistical and nutritional background of the United States data.

(*b*) The first formal meeting of the Committee was held in London on Monday, July 12, 1943. Until July 16 the Committee was engaged in consideration of the statistical and scientific techniques to be employed, and in the preparation of the draft outline of the report. From July 17 until July 21, when the Committee reassembled in Colwyn Bay (the headquarters of the Ministry of Food), the United States and Canadian members, accompanied by some of the United Kingdom representatives, made a brief tour of some typical United Kingdom agricultural and industrial districts in order to obtain a better picture of the administrative organisation, food policy and feeding programmes in the United Kingdom. The work of drafting an interim report was then begun and was completed in London on August 20, 1943.

(*c*) The Committee reassembled at Ottawa on November 8, 1943, to prepare this final report by adding to the interim report the Canadian data, which had not been available at the meetings in the United Kingdom. Some revisions were also made in the United States and United Kingdom statistics in the light of later and fuller information which had become available, and estimates for these two countries for 1940, 1941, 1942 and for the twelve months July, 1943, to June, 1944, were added. This final report was completed and the meetings in Ottawa terminated on November 23, 1943.

Membership of the Committee.

6. (*a*) The members of the Committee present at the meetings in the United Kingdom at which the interim report was prepared were :

United States : John M. Cassels,
Chief of Requirements and Allocations Control of the War Food Administration (leader of the United States representatives).
Leonard A. Maynard,
Professor of Nutrition, Cornell University, Director of U.S. Plant, Soil and Nutrition Laboratory and Consultant to the War Food Administration.
Montell Ogdon,
Office of Foreign Agricultural Relations, United States Department of Agriculture.

United Kingdom : A. N. Duckham,
Head of Supply Plans Division, Ministry of Food (leader of the United Kingdom representatives).
P. G. H. Barter,
Assistant Director of Statistics, Ministry of Food.
J. C. Drummond,
Scientific Adviser to the Ministry of Food.
F. Hollins,
Deputy Director of Import Plans, Ministry of Food.

Canada : Ian McArthur,
Acting Chief, Agricultural Branch, Dominion Bureau of Statistics.

(*b*) The members of the Committee present at the meetings in Ottawa at which this final report was prepared were :

United States : Leonard A. Maynard,
Professor of Nutrition, Cornell University, Director of U.S. Plant, Soil and Nutrition Laboratory and Consultant to the War Food Administration (leader of United States representatives).
Lloyd G. Reynolds,
Associate Professor of Political Economy, Johns Hopkins University ; Requirements and Allocations Control, War Food Administration.
Montell Ogdon,
Chief, Foreign Trade Policies and Programs, Office of Foreign Agricultural Relations, United States Department of Agriculture.
Paul L. Koenig,
Head, Division of Agricultural Statistics, Bureau of Agricultural Economics, United States Department of Agriculture.

Canada : H. F. Angus,
Special Assistant, Department of External Affairs (leader of Canadian representatives).
L. B. Pett, M.D.,
Director, Nutritional Services, Department of Pensions and National Health.
W. C. Hopper,
Principal Economist, Economics Division, Department of Agriculture.
Ian McArthur,
Acting Chief, Agricultural Branch, Dominion Bureau of Statistics, Department of Trade and Commerce.
Anna Speers,
Director of Requirements, Foods Administration, Wartime Prices and Trade Board.

United Kingdom : P. G. H. Barter,
Assistant Director of Statistics, Ministry of Food (leader of United Kingdom representatives at Ottawa).
F. Northam,
In Charge General Branch, Supply Plans Division, Ministry of Food.
W. A. Stuart Williams,
British Food Mission, Washington.

(*c*) At some of the meetings in Washington the Committee had the advantage of the presence of a number of officials of the United States and Canadian Governments, in particular, on the United States side, Hazel K. Stiebeling (Bureau of Human Nutrition and Home Economics), and a number of other officers ; and on the Canadian side, S. A. Cudmore (Dominion Statistician) and W. M. Drummond (Wartime Prices and Trade Board).

(*d*) Loyd V. Steere, E. F. Penrose and Robert L. Oshins, as representatives of the American Embassy and of the Harriman Mission, attended some of the meetings in the United Kingdom. J. A. Langley similarly represented the Canadian High Commissioner's Office, and the Committee had the benefit in the United Kingdom discussions of the presence of a number of United Kingdom officials and of experts from the Department of Medicine, the Low Temperature Research Station and the School of Agriculture at the University of Cambridge.

(*e*) Clifford C. Taylor (Agricultural Attaché, United States Embassy, Ottawa), N. G. Loughnane (Head of the British Food Mission, Ottawa) and S. A. Cudmore (Dominion Statistician, Ottawa) attended some of the meetings in Ottawa.

(*f*) During the discussions in each country, the secretaries to the meetings were : Maxine Enlow for the meetings in Washington in June ; F. Northam (assisted by Alice M. Barter) for the meetings in the United Kingdom in July and August ; and Ian McArthur for those in Ottawa in November.

Reliability of Data.

7. In general the statistical material given in this report is adequate to give a substantially accurate estimate of supplies of all major foods. Further revisions of the statistical material, even for past periods, may in time be necessary as more precise data become available ; any such revisions are likely to be smaller in the case of the United Kingdom than of the United States or Canada. Fairly rough methods of estimation are still necessary for some commodities, but the degree of possible error involved is not large enough to distort significantly the picture as a whole. The figures given for 1943 are provisional, and the data represent the best estimates available in November of that year ; final estimates of actual food production and of food supplies moving into consumption over the whole year will not be available for some months ; it is, however, unlikely that any revisions which may later

be made on the basis of fuller information will materially affect the general picture presented in this report or the conclusions*. The estimates for the year July, 1943, to June, 1944, which are given for the United States and the United Kingdom are mainly forecasts, and therefore more subject to revision than the other figures.

SUMMARY OF REPORT

Scope of Report

8. This report deals mainly with the levels of food supplies moving into civilian consumption in the United States, Canada and the United Kingdom in the year 1943 and in the pre-war period (defined for the United Kingdom as 1934 to 1938, and for the United States and Canada as 1935 to 1939). Part I of the report sets out the general problems involved in making such a study and the methods adopted for overcoming them. The comparison of consumption levels† in the United States, Canada and the United Kingdom is made in Part II of this report, Chapter 5 making the comparison in terms of nutrients and Chapter 6 in terms of the quantities consumed of the different foods. In addition, the trends of food supply levels over the intervening years and the foremost trends in the year from July, 1943, to June, 1944, are briefly discussed (Chapter 7).

Basic Data

9. The data from which average *per capita* figures for consumption levels in different countries can be most readily and directly obtained on a reasonably comparable basis are those relating to the total supplies of food moving into consumption in the areas concerned and the sizes of the populations to be fed from these supplies. The present enquiry has therefore been based almost entirely on this type of data. The coverage has been made as complete as possible and includes food produced by self-suppliers for their own use, as well as food passing through commercial channels. Although data are not available to make as complete nor as refined a study of consumption levels in these countries as would be desirable, it is considered that the broad outlines of the picture as presented here reflect the most significant features in the factual situation with sufficient precision for practical purposes. Reference is made in paragraphs 33 to 35 to supplementary information which would be valuable in enquiries of this nature.

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*Estimates in this report of supplies of food moving into civilian consumption in the United States are derived from the same basic data in general as official estimates by the Bureau of Agricultural Economics published in the National Food Situation in October, 1943 (the date of final revision of statistical material in this report). Differences between the estimates in this report and those published in the January, 1944 issue of the National Food Situation are mainly the result of:

(*a*) Revisions in the basic data since October.

(*b*) Differences in the level of consumption represented. Estimates in the National Food Situation are based on supplies at farm or processor levels, while this study adjusts the data to take out losses between the farm and the retail level for comparability with data of the United Kingdom and Canada.

(*c*) Differences in the items included in the group totals. For example, *per capita* total consumption of meat as estimated in this report includes consumption of edible offal which is not included in the Bureau of Agricultural Economics estimates. This report also includes the estimated quantity of vegetables produced in Victory Gardens which is not included in the Bureau of Agricultural Economics estimates. Therefore estimates in this report of the daily *per capita* supplies of nutrients available for civilian consumption are not comparable with the most recent estimates prepared by the Bureau of Human Nutrition and Home Economics on the basis of the Bureau of Agricultural Economics estimates of *per capita* supplies of food available for civilian consumption.

†For brevity, the terms " consumption level " or " *per capita* supplies " are frequently used in this report in place of the more precise expression " level of food supplies moving into civilian consumption." All such figures represent the total supplies of food moving into civilian consumption measured at the point where they enter the consumer's hands and divided by the total civilian population. They are greater than the quantities of food actually eaten, since some losses in preparation, cooking, etc., are unavoidable.

The Supply Picture in 1943

10. The *per capita* supplies of all foods (by major commodity groups) available for civilian consumption in the United States, Canada and the United Kingdom, expressed in terms of agreed common denominators, are set out in Table 1 on page 12. It will be noted from this table that for all food groups except grain products, potatoes and vegetables, the United States supply level is highest, Canada intermediate, but in most cases close to the United States, and the United Kingdom lowest. For grain products and potatoes this order is reversed, the United Kingdom being highest, Canada next, and the United States lowest. In the case of leafy, green and yellow vegetables and other vegetables, United Kingdom supplies are greatest and Canadian very much the lowest. These facts are illustrated by Chart 1 on page 13. Before the war the commodity composition of the diets of the three countries was essentially similar, though even then some differences existed. These differences have been increased by changes necessitated by wartime conditions, changes which have been greater in the United Kingdom than in the other two countries. This is illustrated in Chart 2, where it will be seen that in the United Kingdom 10 of the 14 commodity groups show changes (+ or —) of more than 20 per cent. from pre-war, compared with two changes of such magnitude in the United States and one in Canada. For most groups in the United States and Canada supplies are close to or rather above their pre-war level. On the United Kingdom side, 9 of the 14 groups show changes in a downward direction, though these have been partly offset by substantially increased consumption in some groups : milk products, grains, potatoes and vegetables. A comparison of the supply levels on a *per capita* basis in 1943 and of the changes since before the war for the main food groups is set out below.

Milk and Milk Products : Each country shows a substantial increase, that for the United Kingdom being noticeably the greatest. As the United States and Canada had appreciably greater pre-war supplies, however, the United Kingdom level for 1943 remains nearly 25 per cent. lower than those of the other two countries.

Meat, Poultry and Fish, and Eggs : For each of these groups—which are entree foods—both the United States and Canada show increases and the United Kingdom a decrease. For the first two groups, the United Kingdom pre-war supplies were higher than either of the other countries ; in 1943 they are noticeably lower.

Oils and Fats : The supply levels in the United States and Canada have been approximately maintained. Before the war the United Kingdom had very slightly the largest supply ; a 16 per cent. decline during the war has brought her supply below those of the other two countries.

Sugars and Syrups : All three countries have suffered a considerable reduction in supplies of sugars and syrups, the reduction being about 30 per cent. in the United Kingdom and about 20 per cent. in the other two countries.

Potatoes : United Kingdom consumption has increased by nearly 50 per cent. to about 65 per cent. above the United States and 25 per cent. above the Canadian levels : consumption levels in the other two countries have increased by less than 10 per cent.

Tomatoes and Citrus Fruits : Before the war, the United States consumption was highest and the United Kingdom consumption lowest for this group. In 1943, the relative positions remained the same but the differences were made more pronounced by a 50 per cent. drop in the United Kingdom level and a 16 per cent. increase in the United States. Canadian supplies were little changed.

Other Fruits and Fruit Products : Declines in available quantities are shown for all three countries, with the most significant decreases occurring in the United Kingdom and the United States ; the Canadian pre-war level was

TABLE 1

ESTIMATED SUPPLIES MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Canada 1943 as % of
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.S.A.
Milk and milk products, excluding butter Total milk solids (fat and non-fat) ...	55.0	54.6	38.3	64.4	64.3	49.2	+17	+18	+28	76	77	100
Meats including cured and canned and edible offal (as carcase weight) ...	134.9	120.1	136.4	141.3	134.4	107.3	+ 5	+12	—21	76	80	95
Poultry, game and fish (edible weight)...	26.1	25.8	30.6	27.6	26.2	18.8	+ 6	+ 2	—39	68	72	95
Eggs (fresh equivalent)	35.6	30.5	24.4	41.2	37.8	22.9	+16	+24	— 6	56	61	92
Oils and fats (fat content)	45.1	41.2	45.6	44.5	43.6	38.4	— 1	+ 6	—16	86	88	98
Sugars and syrups (sugar content) ...	105.3	97.0	94.5	84.0	79.1	65.0	—20	—18	—31	77	82	94
Potatoes and sweet potatoes	142.7	191.7	177.0	155.1	205.1	255.8	+ 9	+ 7	+45	165	125	132
Pulses and nuts (weight without shell) ...	15.8	12.6	9.5	19.3	11.7	5.6	+22	— 7	—41	29	48	61
Tomatoes and citrus fruits (fresh fruit equivalent)	88.3	51.1	46.8	103.0	61.5	23.2	+17	+20	—50	23	38	60
Other fruits and fruit products (fresh equivalent)	151.3	79.6	93.5	104.1	72.4	52.0	—31	— 9	—44	50	72	70
Leafy, green and yellow vegetables ...	85.7	43.9	99.3	93.4	43.2	132.7	+ 9	— 2	+34	142	307	46
Other vegetables	62.3	34.0	48.6	65.4	32.8	64.4	+ 5	— 4	+33	98	196	50
Grain products	200.7	206.9	211.0	201.2	215.4	247.4	—	+ 4	+17	123	115	107
Beverages (tea, coffee, cocoa)	16.0	10.8	13.5	14.3	10.5	12.3	—11	— 3	— 9	86	117	73

NOTES :—(1) The figures in the above table and in all other tables in this report are national averages and should not be taken to represent the actual supply received by each individual consumer.

(2) Differences between estimates for the United States in this table and estimates published by the Bureau of Agricultural Economics in the January 1944, issue of the National Food Situation are explained on page 10 of this report.

(3) Including victory garden production.

CHART 1

COMMODITY SUPPLIES MOVING INTO CIVILIAN CONSUMPTION IN 1943

Consumption per head in Canada and United Kingdom shown as percentages of United States

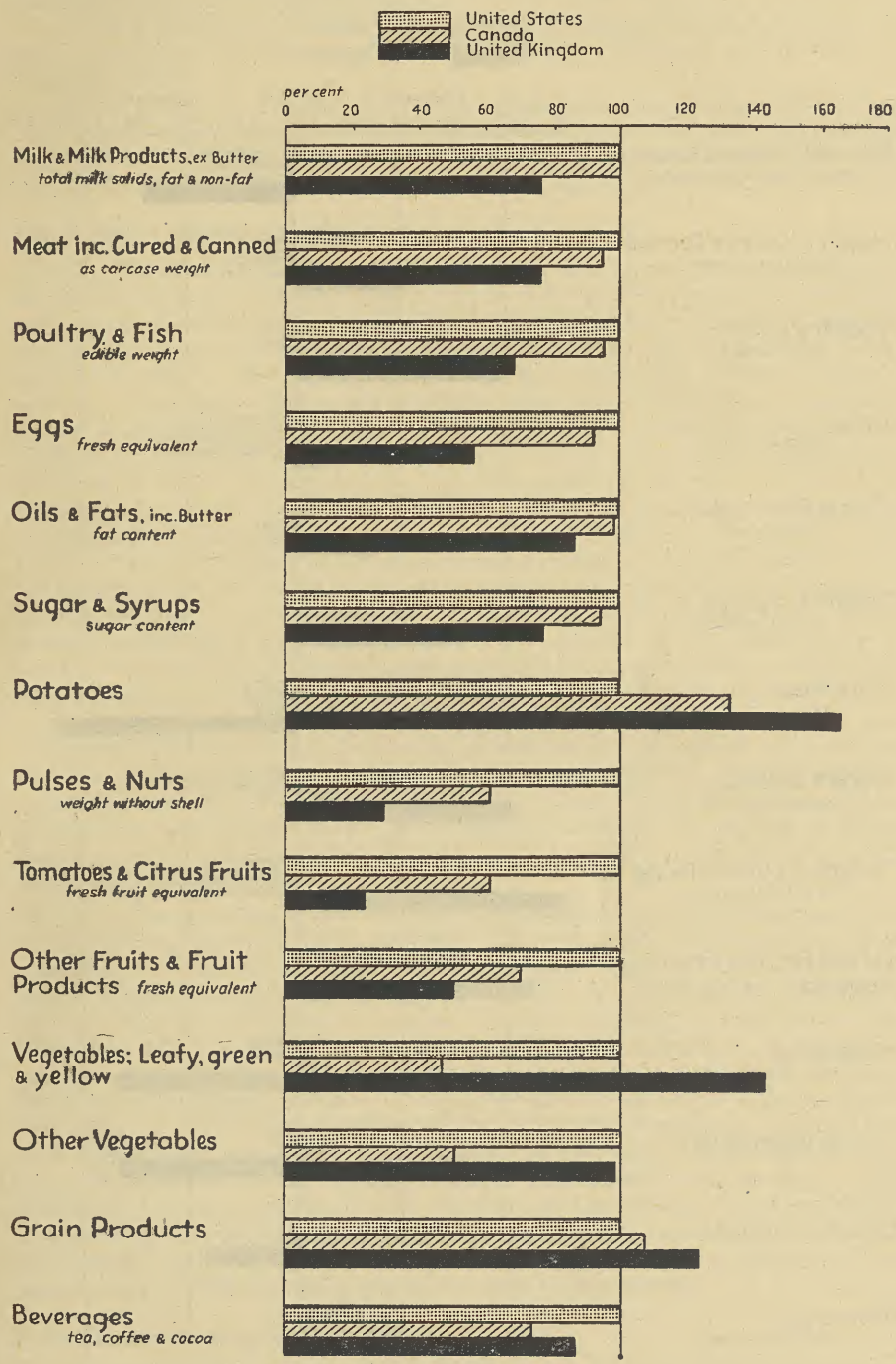
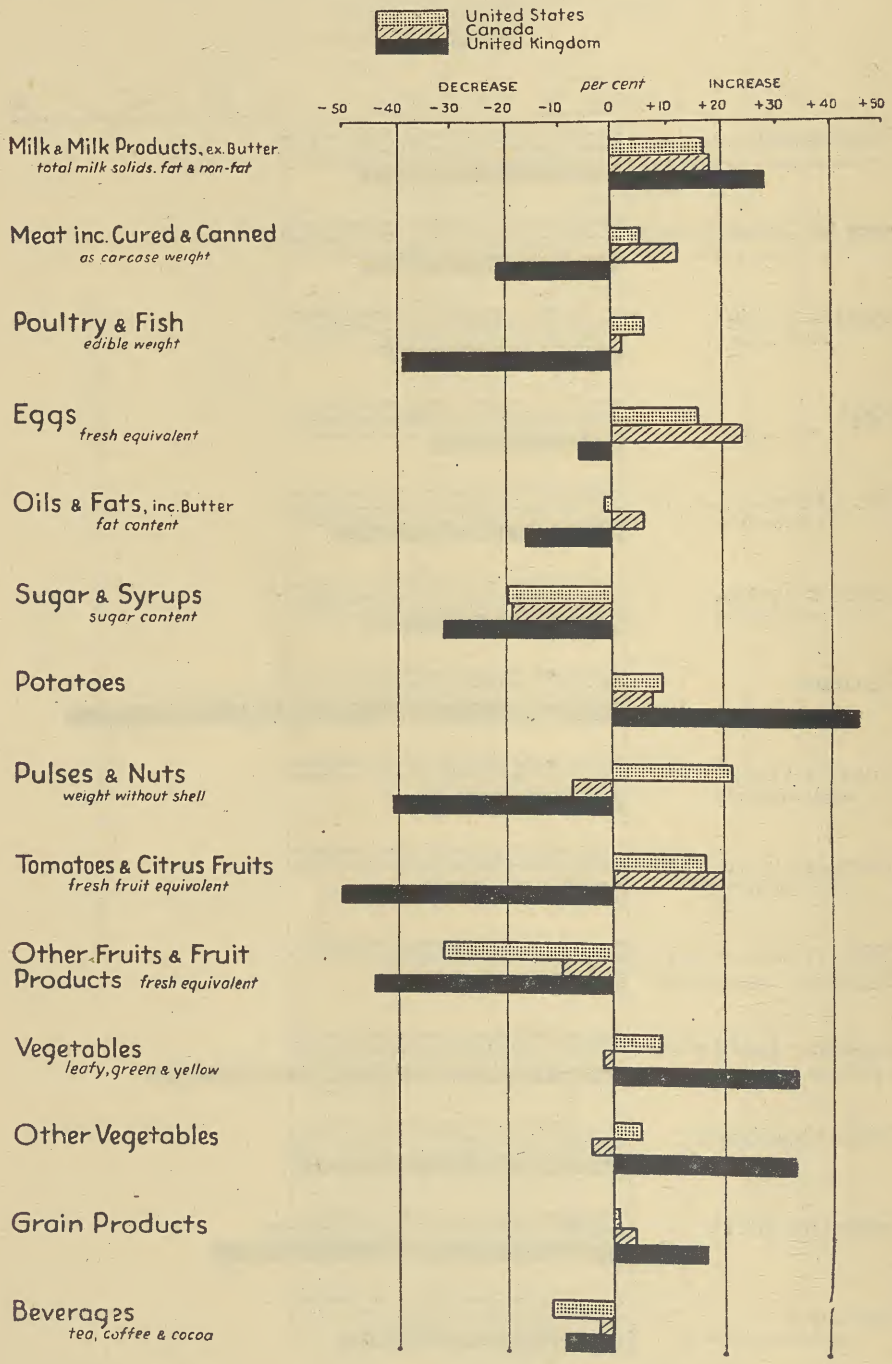


CHART 2

COMMODITY SUPPLIES PER HEAD MOVING INTO CIVILIAN CONSUMPTION

Percentage change 1943 compared with pre-war



lower than those in the other countries and is in 1943 still appreciably below the United States level, although well above the United Kingdom level.

Leafy, Green and Yellow Vegetables : United Kingdom supplies have increased by about one-third to about 42 per cent. above the United States, and some three times the Canadian level.

Other Vegetables : For this group, United Kingdom supplies have risen by about one-third to approximately the United States level and double the Canadian level.

Grain and Grain Products : Pre-war supplies showed only small differences between the three countries. A small increase in Canada and a substantial increase in the United Kingdom bring 1943 supplies in Canada some 7 per cent. and in the United Kingdom some 23 per cent. above the United States level.

The Nutrient Picture in 1943

11. The *per capita* quantities of nutrients contained in the above quantities of foodstuffs, calculated on the basis of the best scientific information available, are presented in Table 2 on page 16. Certain important differences exist in the nutrient analyses accepted in the United States and Canada and those used in the United Kingdom ; these have been reconciled as far as possible, and any significant differences which remain are indicated by bracketed figures and footnotes in the table. A discussion of the problems involved will be found in Appendix IV. In making from Table 2, a direct comparison of the situation in regard to protein, fat and carbohydrates as between the three countries, it will be noted that available supplies in the United States and Canada are somewhat greater than in the United Kingdom. During the four years of war, the United Kingdom diet has suffered a rather sharp decline in fat content, but the 1943 levels of consumption in the United States and Canada are higher than in 1935-39. In each country there has been a slight decline in the supply of carbohydrates and an increase in the total supply of protein. In the United Kingdom, however, this increase has been accompanied by a material decline in the proportion of animal protein to vegetable protein ; in the United States the proportion has remained virtually unchanged ; and in Canada there has been a noticeable increase in the proportion from animal sources. The actual level of animal protein consumption is now appreciably higher in the United States and Canada than in the United Kingdom. When protein, fat and carbohydrates are combined in terms of calories, a slight decline is shown in the United Kingdom and a slight increase in the United States and Canada.

12. In so far as vitamins and minerals are concerned, all three countries have maintained or improved their positions. In general the increases have been greater in the United Kingdom than in the other two countries though the United Kingdom supplies still tend to be the lowest. It should be noted here that the data on nutrients are not all of equal reliability. Thus percentage differences which would be significant in the case of calories or of the major nutrients (protein, fats and carbohydrates) may not be significant for some vitamins or minerals, because of uncertainties of chemical determination, difficulties of estimating supplies of the particular foods (e.g., vegetables) from which they are largely derived and the substantial losses which may occur in some nutrients during storage, preparation and cooking. (See paragraph 76 and Appendix IV.) Appraisal of the data is therefore largely a matter of informed judgment. As far as possible the extent to which differences may or may not be regarded as significant is indicated in the commentary on the figures given in the text of the report.

Nutrients in Relation to Standards

13. When a comparison is made for 1943 between the quantities of the various nutrients contained in the food supplies of the three countries and the accepted

TABLE 2

ESTIMATED SUPPLIES OF NUTRIENTS AVAILABLE FOR CIVILIAN CONSUMPTION

(per head per day)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Canada 1943 as % of
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.S.A.
Calories	3,228 (3,080)	3,124 (3,020)	2,984	3,283 (3,130)	3,223 (3,120)	2,827	+ 2	+ 3	— 5	86 (90)	88 (91)	98 (100)
Protein—Animal (gm.)	51	49	43	56	57	40	+ 9	+15	— 7	72	71	102
Vegetable (gm.)	38	39	38	39	40	47	+ 3	+ 3	+23	121	116	104
Total (gm.)	89	88	81	95	97	87	+ 7	+10	+ 7	92	90	103
Fat (gm.)	132	122	130	138	133	113	+ 5	+ 9	—13	82	85	97
Carbohydrate (gm.)	420 (380)	417 (390)	373	413 (375)	409 (385)	366	— 2	— 2	— 2	89 (98)	89 (95)	99 (103)
Calcium (mgm.)	868	830	694	996	956	1,054	+15	+15	+52	106	110	96
Iron (mgm.)	14	15	13	16	16	16	+14	+10	+27	103	99	104
Vitamin A (I.U.)	6,486	6,133	3,868 (4,700)	6,979	6,783	3,882 (5,000)	+ 8	+11	—	56 (72)	57 (74)	97
Ascorbic Acid (Vitamin C) (mgm.)	99	58	112	106	61	127	+ 7	+ 6	+13	120	208	58
Thiamin (Aneurin or Vitamin B_1) (mgm.)	1.8	1.9	1.2 (1.4)	2.4	2.0	1.9 (2.1)	+37	+ 5	+60	79 (88)	95 (105)	83
Riboflavin (mgm.)	2.0	1.8	1.6	2.3	2.1	2.1	+18	+13	+30	89	98	90
Niacin (Nicotinic Acid) (mgm.)	18	17	18	20	19	19	+14	+ 8	+ 3	92	100	92

NOTES: (1) The figures in the above table and in all other tables in this report are national averages and should not be taken to represent the actual supply received by each individual consumer. No allowance has been made in the above figures for the substantial losses of some nutrients which may occur in storage, preparation and cooking.

(2) The figures in brackets following those for calories and carbohydrates (U.S.A. and Canada) and for vitamin A and thiamin (U.K.) indicate the approximate values if calculated with the same nutrient factors as for the other countries. For these nutrients the methods of estimation in the three countries are not entirely comparable (paras. 65, 75, 79 and 81 and Appendix IV). For other nutrients this difficulty does not arise and the figures may be regarded as comparable.

average intake requirements, it is found that in all three countries the requirements are exceeded by supplies except in the case of Canadian supplies of ascorbic acid (see Chapter 5). The margin between requirements and supplies of calories is wider in the United States and Canada than in the United Kingdom. Under the best possible conditions it will always be necessary to provide some margin of supplies over requirements for waste and losses if a satisfactory diet is to be maintained (see Chapter 4).

General Character of the Diet

14. A comparison of diets on the basis of nutrients alone is incomplete. Attention must also be given to the general acceptability, including palatability and culinary convenience of the diet (see Chapter 3). An examination of the changes in consumption necessitated by wartime conditions indicates that the United Kingdom diet has suffered more seriously in these respects than has been the case in the United States or Canada (see Chapter 6, particularly paragraphs 87 and 88). The maintenance of a satisfactory level of calories and certain other nutrients in the United Kingdom diet has involved a substantial increase in the use of cereal foods and potatoes (these now contribute 43 per cent. of the total calorie supply compared with 34 per cent. before the war), because supplies of such foods as meats, shell eggs, fats and oils, sugars and fruits have declined. One of the major difficulties experienced by the British housewife has been that of providing main courses (entree dishes). In the entree class of foods there has been the reduction in the United Kingdom from the pre-war period of approximately one-fifth, whereas there have been increases in the United States and Canada (see paragraph 89). The increase of vegetables in the United Kingdom diet has helped to offset the loss of vitamins and minerals in fruit, but, during the winter months particularly, it has been most difficult to provide variety in the diet.

Trends of Supplies since Pre-War

15. The changes which have taken place year by year in the diets of the three countries are shown in Charts 3 and 4 (which are derived from tables 25 and 26 in Chapter 7). They thus indicate the trends of consumption. The United States figures show a marked increase in food supplies in 1940 and 1941 as compared with pre-war. Calories available *per capita* were 7 per cent. greater in 1941 than in 1935-39, the increase being mainly derived from milk products, meat, poultry, eggs, oils and fats and sugar. With the entry of the United States into the war at the end of 1941, supplies of sugar and other imported foods fell sharply and sugar and coffee were rationed. Meats, fats and oils and canned fruits and vegetables were rationed early in 1943. These measures are reflected in the declines in sugar consumption in 1942 and in meat and visible fats in 1943. The result was a decline in the calorie position, which by the end of 1943 stood only slightly above the 1935-39 level. Supplies of minerals and vitamins, on the other hand, continued to rise after 1941 and by 1943 stood well above the 1935-39 level. The most important factors in this increase were the enrichment of flour with iron, thiamin, riboflavin and niacin and the substantial increase in available supplies of fluid milk. In spite of reduced supplies and rationing of several important foodstuffs, the consumption of all nutrients, except carbohydrates, was higher in 1943 than in 1935-39.

16. The Canadian figures show a steady improvement in the supplies and the quality of the diet up to 1943 but the effects of rationing are shown in the reversal of the advance in the consumption of sugar in 1942 and fats in 1943. From a pre-war consumption level below that of the United States in almost all nutrients, the general increase in the Canadian consumption level has brought supplies of all nutrients in 1943 to approximately the United States level with the outstanding exception of ascorbic acid ; the low level of Canadian supplies of this vitamin has already been noted.

CHART 3A

PER CAPITA SUPPLIES MOVING INTO CIVILIAN CONSUMPTION

PRE-WAR TO 1943/44 (Commodity Groups)

United Kingdom ——— Canada - - - - - - - - United States ———

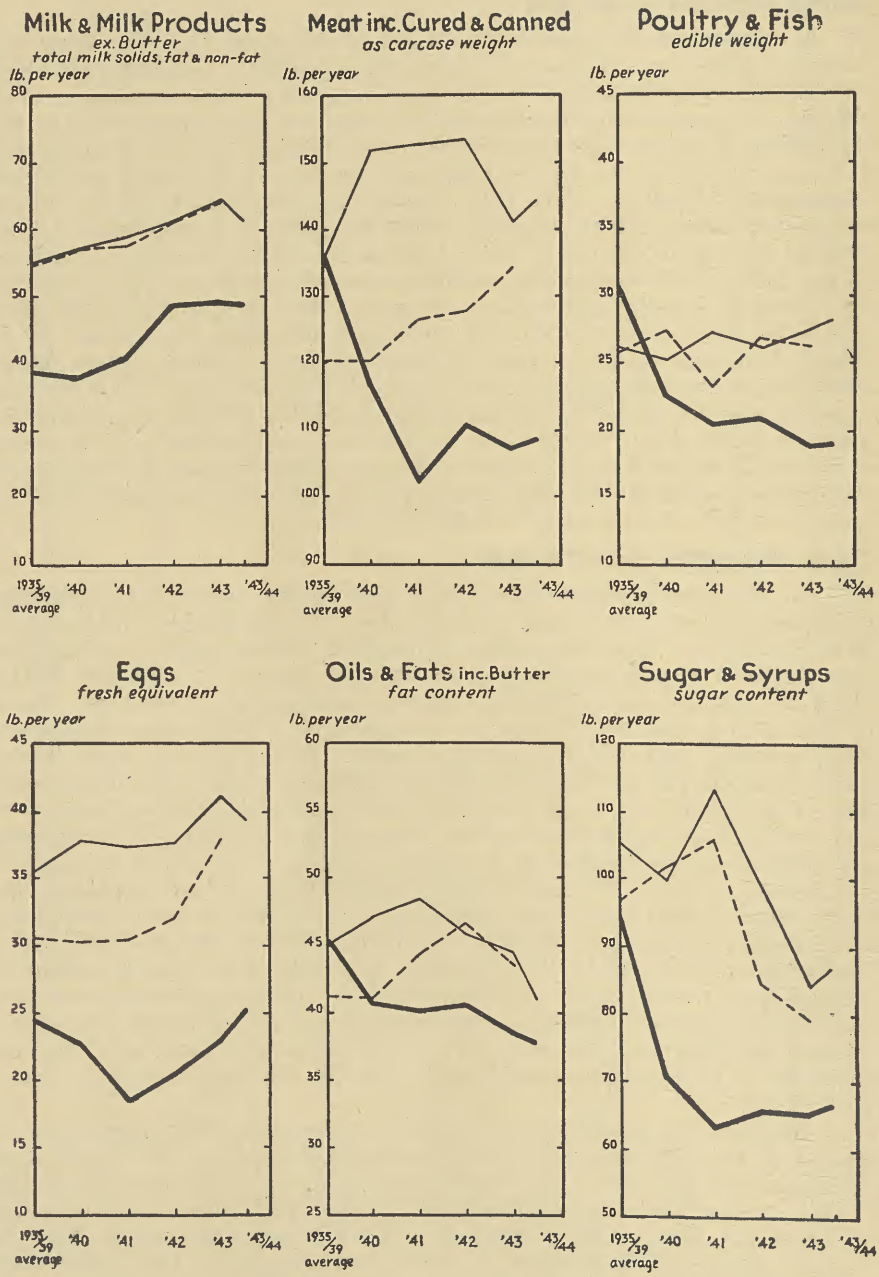


CHART 3B

PER CAPITA SUPPLIES MOVING INTO CIVILIAN CONSUMPTION

PRE-WAR TO 1943/44 (Commodity Groups)

United Kingdom ———— Canada - - - - - - - - United States ————

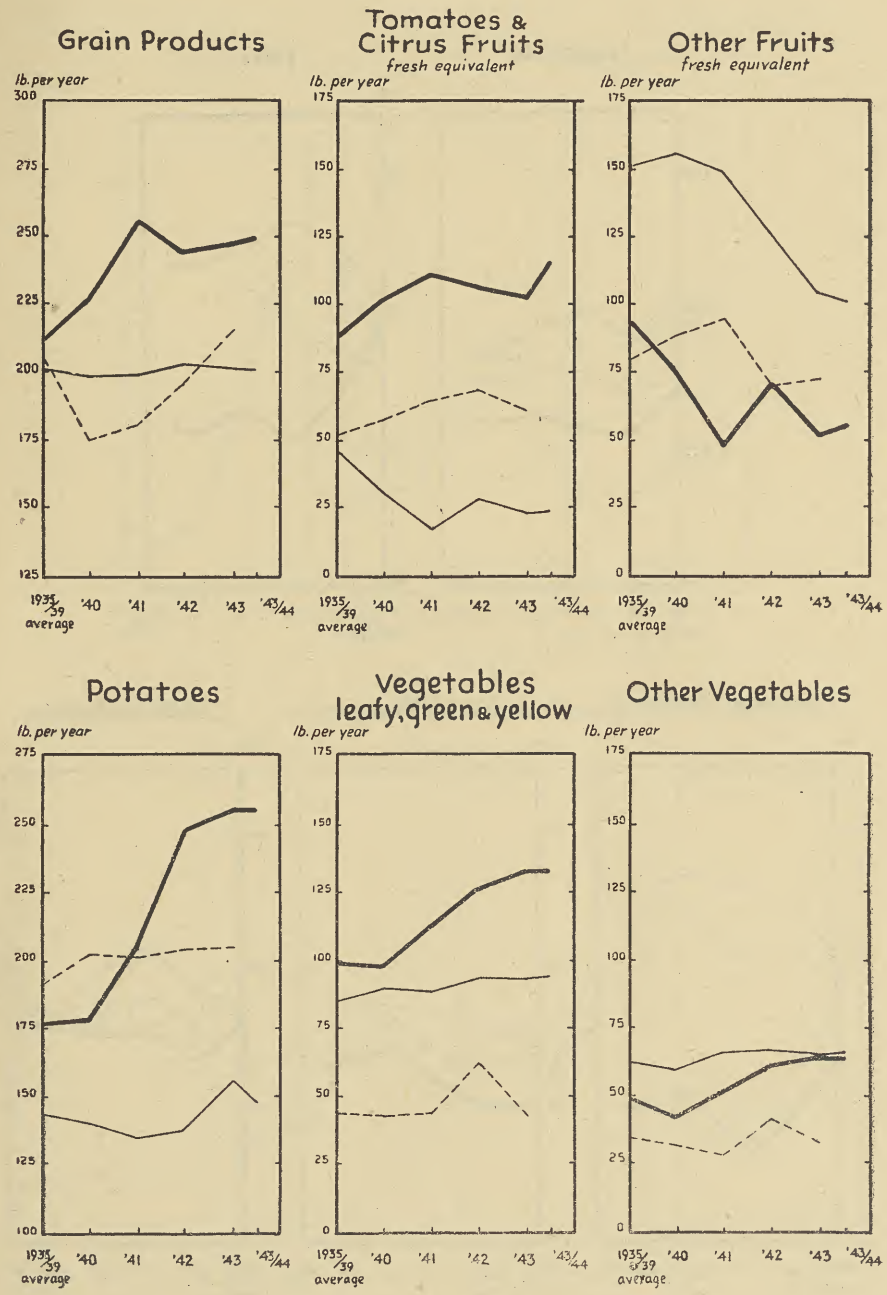


CHART 4A

DAILY PER CAPITA SUPPLIES MOVING INTO CIVILIAN CONSUMPTION

PRE-WAR TO 1943/44 (Nutrients)

United Kingdom ——— Canada - - - - - - - - United States ———

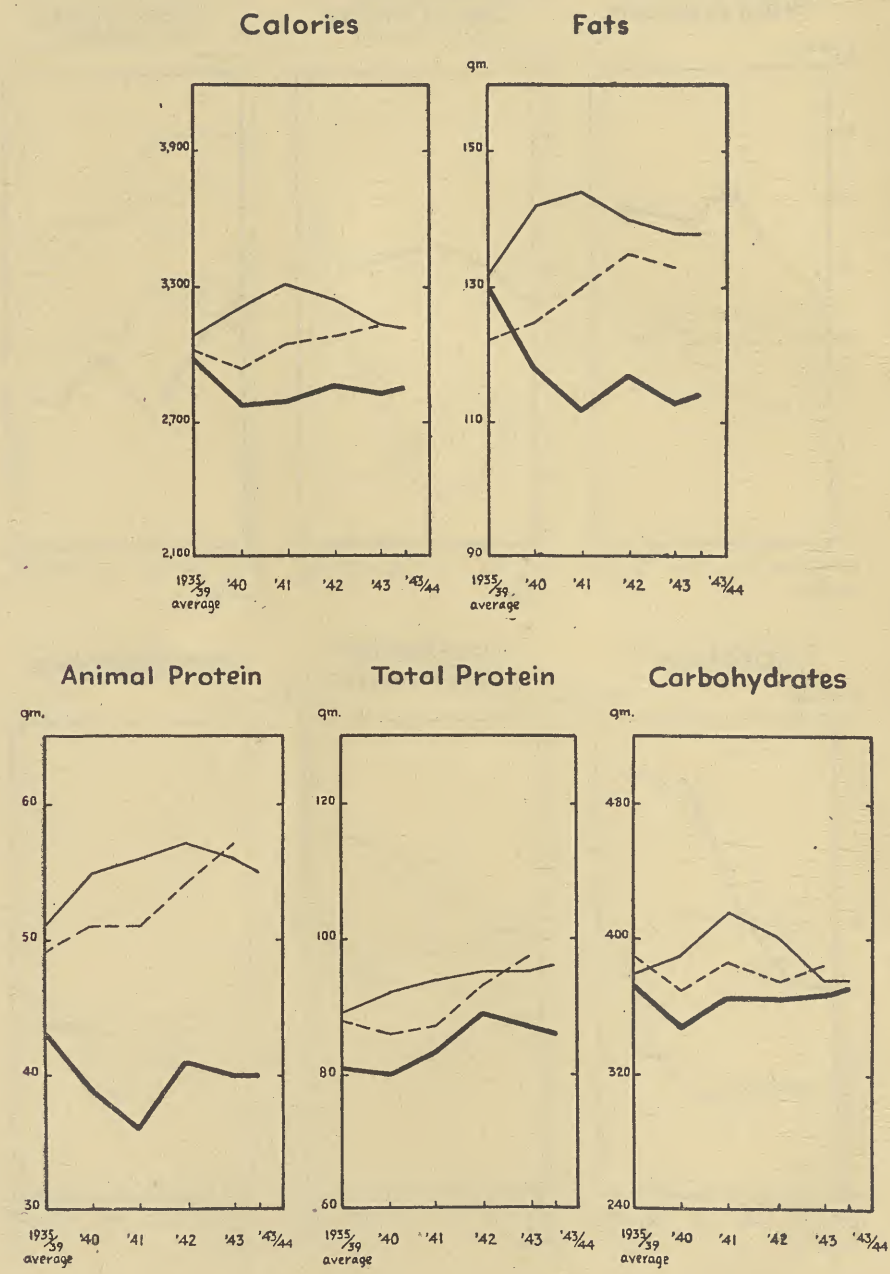
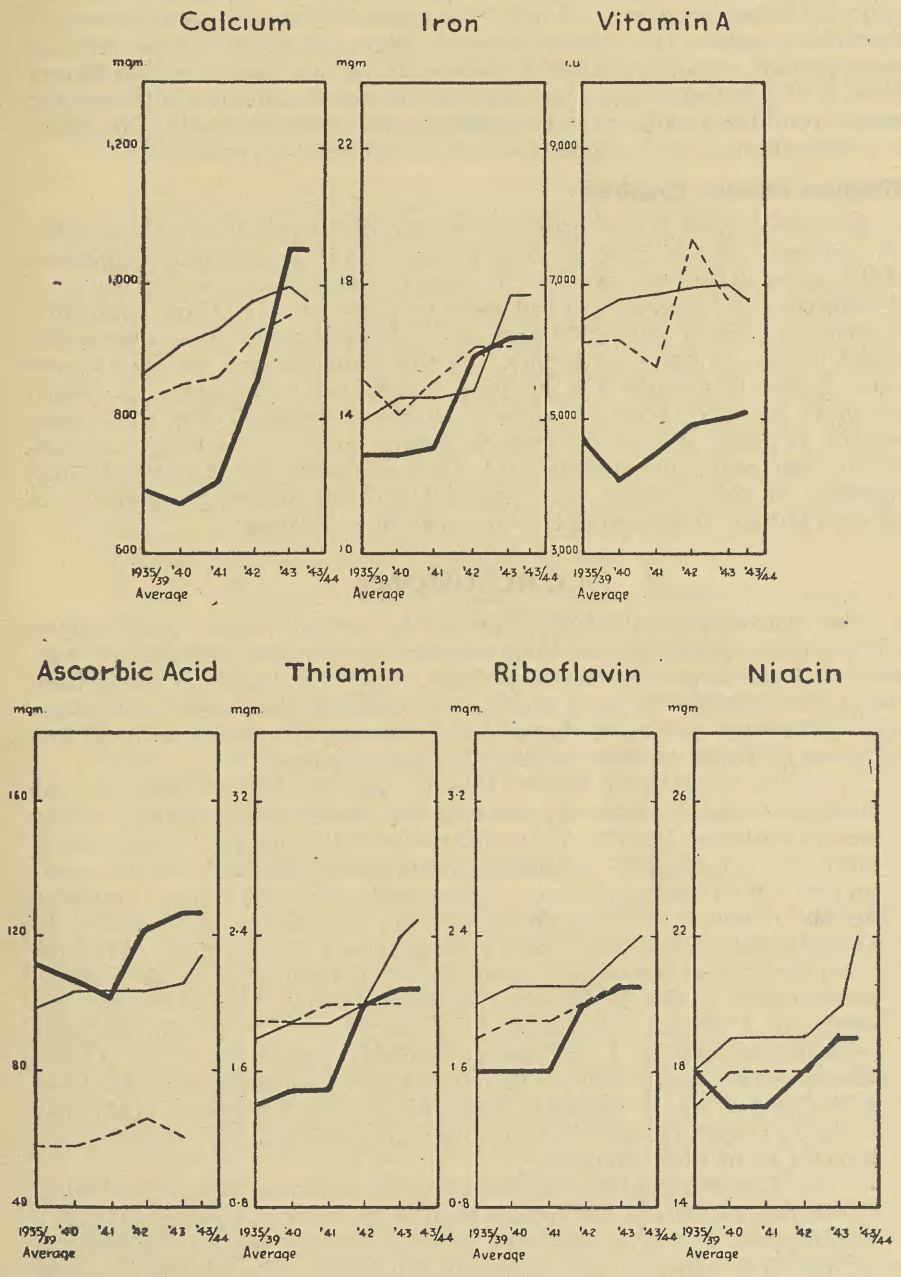


CHART 4B

DAILY PER CAPITA SUPPLIES MOVING INTO CIVILIAN CONSUMPTION PRE-WAR TO 1943/44 (Nutrients)

United Kingdom ——— Canada - - - - - - - - United States ———



17. In the United Kingdom there was a sharp fall in food supplies in 1940 and 1941, particularly of meat, visible fats, sugar and fruit, which greatly reduced the palatability as well as the nutritional value of the diet. These changes are reflected in the nutrient figures for fats and animal protein, but the loss of carbohydrates in sugar is largely offset by the increased consumption of starch in bread and potatoes. At the period of greatest shortage in the first half of 1941 calorie supplies fell to 2,680, animal protein to 33 grammes and fat to 105 grammes per head per day and there were indications that the diet was inadequate. The 1942 figures show an improvement, largely resulting from Lend/Lease supplies, and from then onwards supplies have remained remarkably constant at a calorie value of rather over 2,800, though fats and animal protein remain considerably below the pre-war level. A satisfactory feature of the British position has been the improved supplies of vitamins and minerals resulting mainly from the increase in the extraction ratio of flour and the increased supplies of vegetables and milk and milk products.

Differences between Countries

18. As a background to comparisons of consumption levels in several countries, it is necessary to take into account certain of the fundamental differences which may exist between countries in respect of such factors as the degree of self-sufficiency and geographical and social background. The United Kingdom is a compact, densely populated area and is dependent on imports for a substantial portion of her food supply. In the United States and to an even greater degree in Canada, the situation is different and supplies of certain foods have normally been in excess of domestic demand. For this reason there has probably been a tendency for greater losses in marketing and distribution and wastes in consumption. This, combined with a relatively high proportion of self-suppliers, has rendered the administrative problems of food distribution on an equitable basis much more difficult.

CONCLUSIONS

19. The conclusions of the Committee on the present state of food supplies in the countries concerned and their relation to nutritional and dietary standards are listed below in summary form. They are based on the general facts as developed in the study and on the extended discussions in the Committee. The most pertinent chapters and paragraphs relating to each conclusion are indicated in brackets for reference purposes.

(*a*) In the United States, Canada and the United Kingdom the total food supplies currently entering into civilian consumption, if they were distributed broadly in accordance with physiological needs, would with one exception, be sufficient to meet nutritional intake requirements on a restricted basis (as defined in paragraphs 40 to 43) without impairing health, morale or working efficiency. The exception is in respect of the Canadian supply of ascorbic acid which appears to be marginal. With the exceptions noted below, they would be adequate to meet intake requirements based on the full National Research Council (United States) "recommended dietary allowances" of nutrients. The exceptions are: certainly ascorbic acid in Canada; probably vitamin A in the United Kingdom and ascorbic acid in the United States and the United Kingdom (allowing for the considerable losses of the latter nutrient which may occur in storage, preparation and cooking), and possibly riboflavin and thiamin in all three countries.

(*b*) The estimated *per capita* supplies of most nutrients in the United States and in Canada are greater than in the United Kingdom (Table 2 and Chapter 5). The calculated average nutrient intake requirements of the three countries are practically the same. (Paragraphs 40 to 43, 66 to 68 and Appendix III.) With the exception of a few individual

nutrients, the margins between nutrient supplies and intake requirements actually existing at present in the United States and Canada are wider than in the United Kingdom. Some margin must be allowed because waste in consumption and disparities of distribution in relation to needs cannot be entirely eliminated. Under present conditions these are probably greater in the United States and Canada than in the United Kingdom. (Paragraphs 69 to 71.)

(*c*) To the extent that the distribution of food in the three countries can be so improved as to narrow the range of variations in consumption that now exist above and below actual individual requirements, the total food supply necessary to ensure an adequate level of consumption for the population as a whole will be correspondingly reduced. In the United Kingdom essential foods, broadly speaking, are already being distributed according to needs and the scope for further modification of the distribution pattern along these lines is narrowly limited. (Chapters 4 and 5.)

(*d*) From the point of view of variety, acceptability to the consumer and culinary convenience, the United Kingdom diet is inferior to those of the United States and Canada (Chapter 6). In the United States and Canada considerable economies in the use of basic food resources are physically possible. To achieve them would involve further adjustments in the commodity composition of the supplies entering into civilian consumption, i.e., through further shifts from commodities in the production of which resources yield relatively low nutritional returns to those where the nutritional returns are higher. The need for economy in shipping and in agricultural production has already resulted in substantial changes in the commodity composition of the United Kingdom diet. In the present circumstances further appreciable changes of an unfavourable character in the United Kingdom diet would give rise to apprehension about their possible effects on the work, output, health and morale of the civilian population (Chapter 4 and paragraphs 91 and 92).

(*e*) In all three countries dietary changes must be considered in relation to public reactions. A material reduction in the acceptability of the diet may have serious consequences both on the morale and on the nutritional status of the population concerned. Any substantial change in the composition of civilian supplies from favoured and familiar foods to less favoured or to less familiar foods can be safely made only if it is possible to convince consumers that the circumstances fully justify the adjustments required of them, and if due account is taken of the fact that the process of consumption adjustment will require time and guidance.

NEED FOR CONTINUING WORK

20. Estimates of food supplies and consumption may be approached by a number of methods—e.g., dividing estimated total supplies by population numbers, summation of ration allowances, or dietary surveys—but results arrived at by the various methods will not be comparable. Estimates based on ration allowances or on dietary surveys do not give complete coverage, and estimates based on total supplies are, therefore, the most suitable for international comparisons, though the other methods can provide valuable supplementary data. Even if two or more countries prepare estimates by the same basic method, considerable differences may arise from divergent treatment of such matters as the scientific basis of calculating nutrient values, the point of distribution at which supplies are measured and the coverage of the statistics. This report, it is believed, constitutes a substantial beginning towards the securing of an adequate basis for international food consumption comparisons. Further steps along the lines of the present study which should be anticipated and planned for are as follows :

(*a*) *Application of technique developed in this enquiry to future data.* It is recommended that the statistical material presented in this report should be revised and extended in time at six-monthly intervals by the respective Governments. It is further suggested that the Combined Food Board might set up a suitable committee to colate and interpret the statistical material submitted. In any event, staff work by appropriate units in the Governments of the three countries concerned, co-operating as closely and directly as possible in the exchange of current information along the lines developed in the present enquiry, will be desirable.

(*b*) *Securing of better data and improvement of techniques.* This will call for co-ordinated work in each of the three countries to obtain better basic statistical and nutritional data of the nature required in consumption studies and comparability in the data and methods used. In particular, there is need for adequate dietary survey data as an indication of the relative positions of different occupational, income, regional or other groups of the population. Any such developments in technique might require joint discussion on the lines of those of the present *ad hoc* committee between technical experts of the countries concerned.

(*c*) *Extension of studies to other countries.* Should the need arise for studies of this nature to be extended to other countries, either through joint committees or international agencies, they might with advantage be directed along lines similar to the present enquiry and related as far as possible to it.

21. There has been a growing awareness of the importance of nutrition and of the necessity of international co-operation in approaching food problems, as is evidenced by reports of various international organisations and scientific associations. This was recently re-emphasised by the United Nations Conference on Food and Agriculture held at Hot Springs, Virginia, in May, 1943. The Committee wishes to direct attention to the usefulness in connection with post-war food problems of the technique used in this study for estimating and comparing supplies of food moving into consumption in different countries.

PART I

GENERAL PROBLEMS AND METHODS IN AN INTERNATIONAL FOOD CONSUMPTION LEVELS ENQUIRY

CHAPTER 1

METHODS OF ESTIMATING CIVILIAN FOOD SUPPLIES

22. The broad principles of assessing the total supplies of foodstuffs available for civilian consumption may be very simply stated. In any period, the total quantity of foodstuffs produced in a country (both on farms for sale and by self-suppliers) added to the total quantity imported and adjusted for changes in stocks, gives the total supply moving into consumption. If from this are deducted the quantities wasted, fed to livestock, or used for seed or for industrial and other non-food purposes, we arrive at the supply moving into human consumption. A further deduction of all food exported or set aside for the Armed Forces leaves the total quantity available for civilian consumers. Division by the civilian population (including any Service personnel fed directly from civilian sources) gives the average available per head. The theory is thus simple, and the considerable difficulties of actually assessing supplies with any accuracy are practical difficulties of measurement, of ensuring complete coverage, of eliminating supplies not going to civilian consumers and of avoiding duplication.

Import and Production Statistics

23. Adequate records are usually available of the total supplies of imported foods reaching a country in any period, though difficulties may arise and must be dealt with commodity by commodity in estimating what fraction reaches the civilian consumer. The estimation of supplies of home produced foods is usually more complicated, particularly when production is widely dispersed or largely in the hands of small producers. It will in some cases be necessary to rely on estimates derived almost entirely, or even solely, from statistics of crop acreages, livestock populations and estimated yields per acre or per animal. Where a large part of the production comes from self-suppliers, as in the case of poultry products or vegetables, even these data are lacking and only very approximate indications (based on indirect evidence) are possible. Great care is required in the making of crop and livestock production estimates where these are to be used in preparing estimates of supplies moving into civilian consumption. Crop and livestock production estimates can serve as a sound foundation for the preparation of estimates of available supplies of foodstuffs for civilian consumption only when data on component parts which make up the estimated total production and supply of a commodity have been carefully compiled and checked against all available records and sources of information on amounts processed, or sold, and other specific knowledge of utilization.

Marketing and Processing Statistics

24. Fortunately, for some important foodstuffs, marketing has reached a fairly high degree of organisation through commercial, co-operative or government agencies and more or less complete records of sales off farms become available to supplement or even replace estimates based on acreage and livestock statistics. Still greater accuracy is possible for foods such as sugar or flour which must be manufactured or processed before consumption, particularly when this is done on a large industrial scale. Extensions of government control, whether for customs or excise purposes or for the control of production or distribution, may still further increase the accuracy of measurement. In the case of United Kingdom supplies of meat, butter and other rationed foods, where virtually the whole supply becomes the property of

the government or government agencies, the extent and destination of supplies moving into consumption are known on an accounting basis. Where statistical estimates (as distinct from accounting records) are employed, they may be regarded as dependable where substantially the same result is obtainable by independent calculations based on different original material and where the estimation is found to give a consistent series of results over a considerable period of time.

Stage of Processing

25. In the case of processed foods consideration must be given to the stage of processing at which supplies should be taken into account, e.g., whether as wheat, flour or bread. To use data for primary raw materials such as wheat or unrefined oils involves increased difficulties regarding allowances for non-food uses. On the other hand to pass on to the final stage (e.g., bread, cakes, biscuits) brings in still greater difficulties in estimating the composition of compound foods and avoiding duplication. The final decision will depend on the statistical material available, but as a broad generalisation it has usually been found most convenient to take the first stage of processing at which the commodity becomes suitable either for direct use as human food or for culinary use, e.g., flour, margarine, lard.*

Stock Changes

26. Allowances for changes in stocks become increasingly important the shorter the period under review. Normally over a period of 3—5 years stock changes may be ignored without serious error. For periods of one year or less they become important, particularly under war conditions when substantial reserve stocks of the more concentrated foods must be maintained. Seasonal stock changes must also be taken into account. Adequate records of stocks on farms and in government and large commercial warehouses are therefore an essential of accurate measurement. Changes in retail stocks are difficult to estimate but United Kingdom experience is that they may generally be ignored without risk of serious error.

Comparability and Dependability

27. When statistics of more than one country are being set side by side, particular care is necessary to ensure comparability. Points of detail (for example the extent to which food produced by self-suppliers is taken into account, or whether carcases are "dressed" with or without head) if not cleared up, may seriously distort the comparison for individual foods and even cumulatively the picture as a whole. At the outset of the present enquiry a systematic review was therefore made, commodity by commodity, of the statistical data originally prepared in the three countries, and where defects of comparability were found, the figures for one country or the other were adjusted to bring them to a comparable basis. At the same time a comparison was made of the dependability of the consumption statistics for the individual commodities and the figures were graded on the following scale :

Grade "A." Estimates where virtually the whole supply is covered on an accounting basis, e.g., where it is controlled by the government or by government agencies.

Grade "B." Estimates based directly on reliable and reasonably complete records such as import statistics, comprehensive production or sales returns by manufacturers, traders, control boards, etc., and estimates where a substantial part of the

*The shorter the period under review however, the less adequately is consumption represented by the primary processed foods and the more necessary it becomes to move over to compound foods. When compound foods such as condensed milk or jam are included in the calculation, special care is necessary to avoid duplication of the ingredients (liquid milk, sugar, fruit).

supply is covered on an accounting basis and the balance more roughly estimated.

Grade " C." Estimates based mainly on statistics of crop acreages, livestock populations and yields and which have been found in the past to be reasonably reliable.

Grade " D." All others, i.e., estimates of a less reliable nature which are based on inadequate data or which have been prepared without opportunity for a check on the component parts of the statistics of total production, imports, or sales, and where the margin of statistical error may be rather pronounced.

28. It should be emphasised that to avoid any possible confusion, all statistics submitted for international comparisons should be adequately annotated to indicate the methods used, particularly where a number of food items are grouped under one heading.

TABLE 3

GRADING OF FOOD SUPPLY STATISTICS FOR DEPENDABILITY

(see paras. 27, 28 and 29 for explanation)

	United States		Canada		United Kingdom	
	Pre-War	Current	Pre-War	Current	Pre-War	Current
Dairy products	B	B	B	B	B	A
Meats	B	B	B	B	B	A
Poultry and fish	C+	C+	C	C	B	B
Eggs	B—	B—	B—	B—	B—	B+
Oils and fats	B—	B+	B+	B+	B	A
Sugars and syrups	B+	B+	A	A	A	A
Potatoes	C+	C+	C	C	C+	B
Pulses and nuts	B	B	C	C	B	B
Tomatoes and citrus fruit...	C+	C+	C	C	B(*a*)	C(*a*)
Fruit (other than citrus) ...	C+	C+	C	C	B(*a*)	C(*a*)
Leafy, green and yellow vegetables	C—	C—	C	C	C—	C—
Other vegetables	C—	C—	C	C	C—	C—
Grain products	B+	B+	A	A	B	A
Beverages	B—	A	A	A	A	A

Notes: The sign + or — after a letter represents a grading rather above or below the average for the grade.

(*a*): The down grading of current compared with pre-war United Kingdom fruit statistics reflects the change over from mainly imported to mainly home produced supplies.

29. It was found that in each of the commodity groups adopted in this enquiry (see paragraph 49), the estimates were preponderantly of one type so that it was possible to grade whole groups of commodities on this scale. The gradings assigned to them for the purpose of the present study are set out in Table 3 above. It will be noted that most of the current United Kingdom statistics fall into the " A " and " B " grades and most of the Canadian and United States estimates into grades " B " and " C." This is accounted for by the longer operation and more developed state of food control in the United Kingdom. Estimates for the pre-war period before the development of control have been separately graded and fall to a greater extent into the " B " and " C " grades. The statistics of some individual commodities of all three countries fall into the " D " grade but in no case was a whole group placed in this category. Much of the data for 1943 are necessarily estimated and may require

subsequent revision. In general statistical material in the three countries is adequate to give a substantially accurate estimate of supplies of all major foods, and though fairly rough methods of estimation are still necessary for a number of commodities the degree of error involved is unlikely to distort significantly the picture as a whole.

Stage of Distribution

30. To match the statistical data on supplies with the analytical data on nutrients it was found necessary to estimate supplies as at the point of retail sale for all commodities except meat, for which comparisons were made at the point of primary distribution. This involves the problem of making some assessment of wastage in the more perishable foods during marketing and in some cases also on farms. Only rarely have detailed studies been made of the extent of this factor (e.g., wastage in fruit imported into the United Kingdom before the war) and in general more or less arbitrary deductions must be made based on general trade experience. Fortunately the foods in which wastage is greatest and most difficult to assess do not contribute very largely to the total calorie intake so that here the possible error is not as serious as it might appear, though it becomes significant when vitamins and minerals are considered. As far as can be judged, the methods used for making allowances for wastage in the three countries are reasonably comparable.

Coverage

31. The statistical data, from which the estimates of commodity supplies moving into civilian consumption were derived, cover virtually all supplies and include food bought for household use, food used in catering establishments (hotels, restaurants, canteens, etc.) and quantities used for food manufacture (e.g., flour, fat and sugar for biscuits). They also take into account food produced by self-suppliers for their own use (e.g., milk consumed on farms, eggs produced by domestic poultry keepers, fruit and vegetables produced in yards, gardens and allotments). Other sources of food supply (e.g., rabbits and game) have also been taken into account. Two minor omissions from the list of foods may be noted, namely : spices and condiments ; and vitamin concentrates other than those used for fortifying bulk foods such as flour and margarine. Concentrated fruit juices supplied to young children in the United Kingdom under a special distribution scheme are, however, included. The effect of these omissions on average *per capita* nutrient supplies is negligible.

32. It is important to note that the figures given in this report for *per capita* supplies of various foods, and also of nutrients, will not be directly comparable with estimates derived from the summation of ration allowances or from household consumption surveys. Ration comparisons give much lower *per capita* figures as they do not take into account the consumption of unrationed foods, consumption by self-suppliers, or off-the-ration eating in canteens and restaurants. Household surveys also tend to give lower figures ; such surveys do not always take full account of food eaten away from home or of self-supply, and often place emphasis on the lower income groups.

Need for Supplementary Data

33. The present enquiry has been based primarily on statistics of total food supplies available for civilian consumption and on the numbers of persons in the population to be fed. Apart from improvements and refinements in data of this type, additional material which would enable a more comprehensive study to be made can be obtained from consumption surveys and from medical evidence regarding the health of the population under consideration.

34. Survey results can be used, as a national average cannot, to indicate whether particular individuals, families and occupational, income or regional groups within the nation are being more, or less, adequately provided for. The results of such survey investigations are even more valuable if, in addition to securing information regarding the quantities of food purchased or eaten

by the individuals or households making up the survey sample, the condition of health of the individuals can be assessed by clinical examination and data can be collected on such socio-economic factors as housing conditions and food storage and cooking facilities. Evidence from other sources of the health conditions of the people, records of changes in body weights and other similar data will provide valuable supplementary information.

35. During the last ten years, the technique of dietary surveys has rapidly developed. Admittedly such surveys can, at best, sample only a small proportion of the population and are often imperfect in that they may not completely record, for example, all the food purchased by a family or obtained from its farm or garden or from feeding in restaurants and factory canteens. Nevertheless they are of great importance under conditions of food stringency in obtaining some indication of the extent to which individuals are satisfying their needs, how far they are taking up their rations, how they are disposing of their points and so on. In the United Kingdom, the Ministry of Food operates a continuous dietary survey which has proved of considerable use for these purposes. Similar data are not available for the United States and Canada.

CHAPTER 2

METHODS OF ESTIMATING NUTRIENT SUPPLIES AND REQUIREMENTS

A. Nutrient Supplies

36. Having measured by weight the quantities of food available for civilian consumption, it is necessary to determine the quantity of nutrients per unit weight, in each foodstuff occurring in the diets of the populations under consideration. In view of the variability in the composition of samples of food according to where and how they have been grown or produced, samples for analysis must be selected in such a way that the data for average composition will represent the general supply available for consumption. Wheat, for example, varies markedly in protein content according to both variety and cultural factors. The milks of different breeds of cows vary widely in fat content and thus in calorie value. The values selected to represent the composition of the general supply must, therefore, be averages which are weighted in accordance with the amounts of the different kinds actually available in the country under consideration.

37. When differences occur in the nutrient conversion factors used by different countries it is important to be sure that these differences actually reflect the foods consumed in each country and are not artificially introduced by variations in methods of analysis or by imperfections arising from inadequacy of data or errors of sampling. Careful consideration was given to the possibility of using one set of nutrient conversion factors for the evaluation of food supplies. It was agreed that it would be desirable to use common factors wherever possible, particularly in view of the similarity of many foodstuffs in the United States and Canada. In the case of Canada, it was found possible to adopt United States values with a few minor modifications which appeared to represent characteristic differences in the foods concerned.* In the case of the United Kingdom, it was considered preferable to retain the standard tables of nutrient values agreed upon by the Medical Research Council, which are based on large numbers of analyses of United Kingdom food supplies. Therefore, for the United States statistics, a table of nutrient conversion factors issued by the United States Bureau of Human Nutrition and Home Economics was used; the Canadian tables were derived largely from tables of the United States National Research Council; and for the United Kingdom tables issued by the Medical Research Council were used.

*It has now been agreed that the United States National Research Council and the Canadian Council on Nutrition shall jointly re-examine these differences and construct one table for use in both countries.

38. In order for a comparison, based for each country on its own tables of food values, to be valid, it is desirable that as far as possible the methods of sampling and the stage of distribution at which samples are taken should be similar, and further that the methods of chemical and biological analysis and the factors used in calculating, from the results of such analyses, the nutrient content of each food should, if they cannot be the same, at least be directly comparable. Generally speaking it has been confirmed that the methods of sampling and the stage of distribution at which the samples have been taken are reasonably satisfactory and comparable in all three countries. The factors used in calculating the nutrient content of foods from the chemical analyses are for the most part also comparable, but there are substantial differences in the methods of chemical analysis used for certain nutrients in the United States and Canada on the one hand and the United Kingdom on the other. The nature of these differences and their effect on the comparability of the estimated supplies available in each country are discussed in Appendix IV and the order of the differences involved is indicated by bracketed figures and footnotes in the relevant tables. Here it is only necessary to emphasise the need to reconcile these differences, not only to facilitate future comparison of food consumption levels between the countries concerned in this study, but for general international use.

39. The nutrient content values of the foods have been adjusted so that they represent the values on a retail weight or an " as purchased " basis (that is at the time and place of purchase by the housewife) in all cases except that of meat, for which analyses referring to primary distribution weights have been used. They thus apply to the point of distribution to which the statistics of available supplies used in this report relate.

B. Nutrient Requirements

Individual Intake Allowances

40. Among the many striking advances in our knowledge of nutrition since the last war, none is more impressive than that which enables us to-day to express with a measure of assurance the more important nutritive requirements of individuals in quantitative terms. The Food and Nutrition Board of the National Research Council of the United States recently published a table of estimates entitled " Recommended Dietary Allowances." This table of allowances was approved as a helpful example by the United Nations Conference on Food and Agriculture, 1943, and is reproduced as Table 4 on page 32. (National Research Council Reprint and Circular Series No. 115, Jan., 1943, pp. 2, 3.) These estimates were primarily designed for use in the United States, but it is clear they are applicable to Canada, where they are already widely used, and that they could usefully be employed as a yardstick for assessment of food requirements in the United Kingdom. They have therefore been adopted in this report and are here referred to as " individual intake allowances." It is important to note that, as the word intake indicates, they relate to the quantities of the various nutrients actually taken into the digestive system. It is recognised that these " individual intake allowances " may not be entirely suitable for statistical investigations with population groups, since the allowances are not yet final enough to state whether each figure is an average or is at a higher point in a distribution curve representing suitable physiological allowances for different persons. It may be noted that an " average " of allowances would indicate that half the people concerned need higher allowances and half lower than the figure given, while a figure at the high end of a distribution curve would provide adequately for all sections of a population, even though it might be higher than needed by a part of a population.

Average (full) Intake Requirements

41. The National Research Council standards are for individuals. In order to use them to calculate and compare on a statistical basis the total or the average *per capita* nutrient requirements of two or more countries it is necessary :

(*a*) to have a statistical breakdown of the population of the countries concerned into the National Research Council classification of age, sex and " degree of activity " and statistics of the numbers of expectant and nursing mothers ;

(*b*) to be reasonably assured that the population in each class is similar in each country (e.g., that the 1-3 year age group is not unduly weighted with 1 year olds in one country and 3 year olds in another).

The population statistics of the three countries permit a reasonably accurate breakdown into the National Research Council classification in the case of children and expectant and nursing mothers. There is no evidence to suggest that the nutrient requirements of the people falling in each of these classes are not adequately measured by the appropriate National Research Council standards.

42. The classification of the remaining population—about two-thirds of the whole—presents, however, considerable difficulties. The National Research Council requirements for protein, calcium, iron, vitamin A and ascorbic acid are the same for all adult men and all adult women (except expectant and nursing mothers). The requirements for calories and for the vitamins associated with energy output (i.e., thiamin, riboflavin and niacin) vary substantially between individuals and with their degree of activity. If it were possible satisfactorily to divide the population into groups according to their degree of activity, it would be a simple matter to assign to each an appropriate calorie allowance and thus obtain a weighted figure for the calorie requirement of adult men and women. Unfortunately it must be admitted that the occupational statistics available in the three countries are not an adequate basis upon which to make such an assessment. A " sedentary " office worker may only need 2,500 calories a day ; a " very active " man working in heavy industry (such as coal mining) may need 4,500 calories per day. But the sedentary worker may, in his spare time, be an active gardener or engaged in civil defence ; whilst the man who appears in the population statistics as a coal-miner may only sit on a stool and count tubs of coal. Average calorie requirements can, therefore, only be established within a rather wide range. There appeared to be no practicable alternative to basing the calculations on the assumption that on the average adults of both sexes are " moderately active " ; that is to say, on the National Research Council allowances of 3,000 and 2,500 calories for adult men and women (other than expectant and nursing mothers) respectively.

Average (restricted) Intake Requirements

43. The National Research Council " recommended dietary allowances " are stated to be a " tentative goal toward which to aim in planning practical dietaries." They are recognised as liberal and difficult of fulfilment under prevailing conditions. Experience in the United Kingdom has shown that somewhat lower levels of intake of minerals and vitamins are compatible with a good general state of nutrition, although doubtless health could be improved if the full allowances were obtainable. We have therefore adopted as " average (restricted) intake requirements," the National Research Council figures for calories and protein in all cases and for minerals and vitamins in respect of the groups up to the age of 20 and expectant and nursing mothers, and 70 per cent. of the National Research Council allowances for minerals and vitamins for adult men and for adult women (other than expectant and nursing mothers).*

*The Advisory Committee on Nutrition to the Foods Administration of the Canadian Wartime Prices and Trade Board have also recently (July 23, 1942) adopted for practical purposes a similar yardstick, referred to as the " 70 per cent. Minimum Standards." The lower allowances apply only to vitamins and minerals and are stated to apply to adults only (with certain exceptions) and not to children. They are considered to be " adequate to maintain reasonable health and working efficiency." Very recently the United States National Research Council itself has approved a minimum standard, considered applicable to short time periods, which provides mineral and vitamin allowances, approximately 70 per cent. of those of the original standard.

TABLE 4

RECOMMENDED DIETARY ALLOWANCES [1]

Food and Nutrition Board, National Research Council.

	Calories	Protein gm.	Calcium gm.	Iron mgm.	Vitamin A [2] I.U.	Thiamin (B_1) mgm. [3]	Riboflavin mgm.	Niacin (nicotinic acid) mgm.	Ascorbic acid (vit. C) mgm. [3]	Vitamin D I.U.
Man (70 kg.)										
Sedentary	2,500	70	0.8	12	5,000	1.5	2.2	15	75	6
Moderately active	3,000					1.8	2.7	18		
Very active	4,500					2.3	3.3	23		
Woman (56 kg.):										
Sedentary	2,100	60	0.8	12	5,000	1.2	1.8	12	70	6
Moderately active	2,500					1.5	2.2	15		
Very active	3,000					1.8	2.7	18		
Pregnancy (latter half)	2,500	85	1.5	15	6,000	1.8	2.5	18	100	400 to 800
Lactation	3,000	100	2.0	15	8,000	2.3	3.0	23	150	400 to 800
Children up to 12 years:										
Under 1 year [4]	100/kg.	3 to 4/kg.	1.0	6	1,500	0.4	0.6	4	30	400 to 800
1-3 years [5]	1,200	40	1.0	7	2,000	0.6	0.9	6	35	6
4-6 years	1,600	50	1.0	8	2,500	0.8	1.2	8	50	
7-9 years	2,000	60	1.0	10	3,500	1.0	1.5	10	60	
10-12 years	2,500	70	1.2	12	4,500	1.2	1.8	12	75	
Children over 12 years:										
Girls: 13-15 years	2,800	80	1.3	15	5,000	1.4	2.0	14	80	6
16-20 years	2,400	75	1.0	15	5,000	1.2	1.8	12	80	
Boys: 13-15 years	3,200	85	1.4	15	5,000	1.6	2.4	16	90	6
16-20 years	3,800	100	1.4	15	6,000	2.0	3.0	20	100	

[1] Tentative goal toward which to aim in planning practical dietaries; can be met by a good diet of natural foods. Such a diet will also provide other minerals and vitamins, the requirements for which are less well known.

[2] Requirements may be less if provided as vitamin A; greater if provided chiefly as the pro-vitamin carotene.

[3] 1 mg. thiamin equals 333 I.U.; 1 mg. ascorbic acid equals 20 I.U.

[4] Needs of infants increase from month to month. The amounts given are for approximately 6-8 months. The amounts of protein and calcium needed are less if derived from human milk.

[5] Allowances are based on needs for the middle year in each group (as 2, 5, 8, etc.) and for moderate activity.

[6] Vitamin D is undoubtedly necessary for older children and adults. When not available from sunshine, it should be provided probably up to the minimum amounts recommended for infants.

CHAPTER 3.

GENERAL DIETARY NEEDS

44. It is possible to provide sufficient of each of the nutrients essential to health by innumerable combinations of foods. Experience shows however, that unless careful attention is paid to the bulk and palatability of the diet and to the food habits and traditions of the consumer, as well as to domestic conveniences for cooking and preparation, the planned diet will not be consumed in sufficient quantities to maintain the health, work, output and morale of an individual or a nation.

Bulk

45. Whilst it is not normally difficult to furnish sufficient bulk in the diet, excess bulk may cause digestive disturbances and lead to inadequate total consumption of food, particularly if an increase in the proportion of fibre and carbohydrate in the diet results in a relatively sudden rise in its bulk. For this reason, amongst others, it is desirable that not less than 25 per cent. of the calorie intake should consist of invisible and visible fats, particularly in the case of heavy workers whose calorie requirements are very large.

Palatability and Food Habits

46. Palatability is necessary to ensure adequate consumption and to maintain morale. Foods which improve the flavour and general acceptability of the diet are therefore of much greater importance than their nutrient content may suggest. For instance, fruit, although an important source of certain vitamins, consists largely of water and often contains negligible proportions of calories and protein; nevertheless, fruit is of great value in making the diet more acceptable and adding to its variety. Unless food habits and traditions are given adequate consideration in planning food supplies, morale will be undermined and health and industrial output will suffer because the individual may not consume either enough or the right kinds of food.

Domestic Convenience

47. Convenience of preparation, cooking and use in the home is also important, especially in wartime, when labour, fuel and time must be conserved and when facilities for cooking, etc., tend to be limited.

48. All these are factors which it is difficult if not impossible to measure quantitatively, but which are of fundamental importance in feeding individuals or nations. It is, however, possible broadly to classify foods into a dozen or more major groups. Some of these groups, it is generally recognised, are of greater nutritional value or are more highly prized by the consumer than others. It is therefore possible by measuring changes in the *per capita* consumption of these groups to throw some light on the changes which have taken place or which could take place in the composition of the diet, and to some extent these data can be used to measure changes in the palatability, bulkiness and domestic convenience of the diet and the relation of such changes to food habits and traditions.

Food Groups

49. In this report, all the statistics of the consumption of individual foods have been classified into fourteen main groups, each having distinctive functions. These fourteen groups (which are set out below) differ slightly from the groups set out in the report of the United Nations Conference on Food and Agriculture* since slight modification of the latter was found to be desirable

*P.41. Final Act and Section Reports, United Nations Conference on Food and Agriculture, Hot Springs, Virginia, 1943.

amounts recommended for infants.

for statistical reasons. In the report of the Conference, the physiological and dietary functions of the various food groups were excellently summarised, and the quotations in the notes below are from that report.

(*a*) *Dairy products* (*excluding butter*).—" In fluid, evaporated, or powdered form, as cheese, or in various other forms preferred by different peoples, milk is an economical source of proteins of high quality, calcium and riboflavin. It is also important for certain other vitamin and mineral elements. Milk is the most complete single food " and a very important factor in the nutrition of expectant and nursing mothers and children.

(*b*) *Meats* (*c*) *Poultry and fish and* (*d*) *Eggs*.—" Excellent sources of high-grade proteins and certain of the vitamins of the B group. Eggs are good sources of vitamin A and certain fatty fish also contain this nutrient." These groups are of great psychological and culinary importance in the diet of the United Kingdom, the United States and Canada and, together with cheese, form the " entree " group. One of the foods from the entree group is the basis of the main dish at every main meal.

(*e*) *Oils and fats*.—" The most concentrated sources of food energy, yielding about twice as many calories per pound as protein or carbohydrate. Fats and oils add flavour and satiety value to diets " and are of great importance in cooking, as spreads on bread and in making dull foods appetising. They also help to reduce bulk, which is important for heavy workers who have difficulty in eating enough to meet their high calorie needs.

(*f*) *Sugars and syrups*.—" Sugar and related products, including syrups, molasses, honey and sweet preserves, are of importance as a source of food energy and in adding flavour to the diet."

(*g*) *Potatoes*.—" Economical sources of food energy " and of vitamin C. Sweet potatoes are also a good source of vitamin A.

(*h*) *Pulses and nuts*.—Useful sources of carbohydrates, protein and vitamin B_1 and also in some cases of oils.

(*i*) *Tomatoes and citrus fruit*.—Rich in vitamin C and important for palatability and variety in the diet.

(*j*) *Fruit* (*other than citrus fruit*).—Also help to add palatability and variety to the diet. Many of them are valuable sources of vitamin C.

(*k*) *Leafy, green and yellow vegetables*.—" Important for vitamin C and pro-vitamin A."

(*l*) *Other vegetables*.—Many are important sources of vitamin C.

(*m*) *Grain products*.—" Important as inexpensive sources of energy and protein." " . . . also good sources of iron and certain vitamins of the B group."

(*n*) *Beverages*.

Chapter 4

FOOD ECONOMY IN RELATION TO SUPPLIES AND REQUIREMENTS

50. As the total quantity of available supplies is, to a large extent, dependent upon the character of a nation's food resources and their management, a proper interpretation of figures of *per capita* consumption involves an examination of these background considerations. An attempt is made in the following paragraphs to direct attention to the main factors in the food economy of a country, which must be taken into account in drawing conclusions from statistics. Paragraphs 51 to 56 deal with problems that are directly involved in relating the supply statistics used in this study to national food requirements. Paragraphs 60 and 61 deal briefly with supply potentialities and economies of resources which arise before the point of measurement of supplies adopted for this report, i.e., before the point of purchase by the consumer.

Economy in Consumption

51. Of the total supplies of food as bought by the consumer a certain amount is wasted in preparation and serving, so that actual consumption is somewhat less than the amounts shown in tables of the type included in this report. Under peace-time conditions, waste of food by the individual household was not considered anti-social, although in war-time it is a legal offence in the United Kingdom and is discouraged in the United States and Canada. In peace-time the higher income groups in particular are often selective in their eating at table ; they may eat the lean and leave the fat, eat the heart of a lettuce but not the outer leaves. They are also selective in their kitchens. If bread is becoming stale, if apples are a little blemished, if the remains of an entree have become somewhat discoloured, they may be thrown into the garbage can or burned or fed to the domestic pets. Unavoidable waste is of at least comparable importance. For example, experiments under carefully controlled conditions indicate that 3 or 4 per cent. of the ingredients used in many ordinary recipes are unavoidably left in the utensils and that even a relatively clean plate at the end of a meal may still hold 2—3 per cent. of the food that was put on it.

52. In war-time, apart from the realisation that such selectiveness is wasteful and hampers the war effort, the upper income groups are forced by rationing and by the difficulty of obtaining supplies, to be less fastidious in what they eat and more careful about what they throw away. Scarcity of supplies affords a powerful incentive to economy in consumption, and it can be assumed that the gap between the quantity of food bought for consumption and the quantity consumed is smaller in countries where as a result of rationing and education, consumers have been made more conscious of the need for economy.

53. The quantities set out in such tables as the National Research Council Table of " Recommended Dietary Allowances," are " intake " requirements and represent nutrients actually consumed. They are directly related to the needs of the body. The estimates given in this report of supplies of nutrients are based on the nutrient content of the food " as purchased," i.e., at the stage at which the commodities are normally bought by the consumer, and therefore do not take account of kitchen and table waste nor of the considerable losses, particularly of vitamin C and thiamin, that may occur in cooking.* Although the data available are insufficient to afford a precise quantitative basis for measuring consumption wastes, the general order of their magnitude can be estimated with reasonable confidence at least for the main nutrients. For example, it has been a not unusual practice in the past to deal with the difficulty by adding 10 per cent. to the calorie requirement estimates ; this certainly appears to be adequate and is probably more than adequate under war-time conditions.

Economy and Equity in Sharing

54. Consumption waste, however, is not the only factor to be taken into account in relating intake requirements to the supplies necessary to meet those requirements. It is possible for individuals to starve or for large sections of the population to be seriously under-nourished in a country where the average consumption level is well above the minimum required for the maintenance of health and efficiency. When the government undertakes responsibility for the management of the nation's food supplies, as the national

*At this point there may be introduced the concept of " waste-adjusted supply equivalents " for the accepted intake requirements. These would be based on the " average (restricted) intake requirements " (explained in paras. 40 to 43) to which would be added allowances for losses that occur in the preparation and use of food. In this way account would be taken of the differences between the nutrient intake requirements and the quantities of nutrients necessary in the supplies of food at the point in the marketing system to which the statistical estimates relate.

interest may well demand in time of war, it follows both on the grounds of equity and on the grounds of economy that the food should be distributed (as far as is practicable) in such a way as to meet consumption needs in the order of their essentiality. The maintenance of excessive consumption levels by any particular groups in the population involves a direct waste of food resources; the failure to provide necessaries for those who are in need of them results in a waste of the human resources of the nation. Where the sharing of food among the people of a country is left to the free play of economic forces operating through ordinary market mechanisms, there are many factors (poverty, inequality of opportunity, differences in size of family, marketing imperfections, consumer ignorance, etc.) which tend to produce a pattern of distribution which may be inconsistent with the objective of satisfying needs in order of their urgency or importance. Even under a programme of national food management, many practical difficulties stand in the way of a complete attainment of the ideal.

55. Hence, when average *per capita* figures are used as a basis for the comparative analysis of supplies moving into consumption, care must be taken to see that due allowance is made for the quantities that are lost, from the point of view of the nation as a whole, through maldistribution and through leakages in the system of controls. To the extent that self-suppliers, or specially favoured classes or patrons of black markets are able to obtain quantities of food in excess of what would be their proper share on the basis of their relative needs, the shares available to others will be correspondingly reduced below the levels indicated by the national average figures. In dealing with the food supply problems of a nation it is necessary to think in terms of realistic " market supply equivalents " of whatever average intake requirements are accepted as most appropriate. These must reflect, not only the margin for waste referred to in paragraph 53, but also the further allowances that are necessary to take account of the extent to which the consumption of certain foods or certain nutrients in some sections of the population exceeds the average and may thereby force the consumption of others down to levels below the danger line with respect to health, efficiency and morale. In practice it will always be difficult, if not impossible, to establish any specific quantitative measure of the margin necessary to compensate for disparities of distribution in relation to need. An element of administrative judgment will always be involved. Ordinarily it will prove most convenient to treat the waste and distribution margins together as a general margin that must be provided for in arriving at the " market supply equivalents " of the accepted " intake requirements." Even this general " waste and distribution " margin cannot be assessed with any degree of accuracy.

56. The margin to be allowed for unequal distribution requires qualitative as well as quantitative examination. It is impossible for individuals habitually to eat very much more than their requirements in terms of calories. Even moderate over-consumption of calorie foods leads to obesity. If some sections of the population receive more than their calorie requirements it is probable that the excess is largely wasted. It is, on the other hand, easily possible by selection of food for any individual to consume much more than his requirements of certain types of nutrients, in particular animal protein, vitamins and minerals. For example, if some sections receive more than their share of milk, their excess consumption takes away from the average supplies of milk nutrients available to the rest of the population. Inequalities of consumption within a country may thus necessitate a much greater margin over *per capita* intake requirements for proteins, vitamins and minerals than for primarily energy (calorie providing) foods, if the objective of adequacy for everyone is to be attained.

Pragmatic Evidence on National Requirements

57. The above considerations bring out some of the difficulties to be met with in determining what supplies are needed to meet the food requirements of a nation. In the first place, difficulties of estimating activity (paragraphs 41 and 42) make it impossible to establish precisely requirements of calories. This difficulty does not arise for most nutrients but in some cases individual requirements have been only tentatively or approximately established. In the second place, available evidence is still insufficient to provide the basis for any close estimate of the margins of supplies over requirements which should be allowed to cover wastage in cooking, etc., and inequalities of distribution.

58. There is, however, a second and more pragmatic line of approach which may serve usefully as a check on the analytical results that are obtained by the methods discussed so far—a study of experience under varying conditions of control and stringency of supply. For example, before the war food supplies available for consumption in the United Kingdom provided about 3,000 calories per head per day, a level considerably above any estimate of requirements. Most other nutrients were, on an average basis, also in adequate supply. But in the absence of any control of distribution there were marked inequalities of consumption and all surveys undertaken at that time revealed a considerable incidence of malnutrition. In 1943, United Kingdom supplies of calories average only 2,800 per head per day and supplies of some other nutrients are also lower, but it is known that malnutrition has been reduced by the levelling out of consumption. Some clue to the lower limit of supplies comes from United Kingdom experience in the period of greatest stringency since the war began, viz., in early 1941. At that time supplies fell to an average of less than 2,700 calories per head per day and although rationing was well established, there were indications of impaired health and working efficiency. General experience tends to show that while the current United Kingdom supply level is adequate, the slightly lower level in 1941 was less than adequate, though some allowance must be made for the rapidity with which consumption levels fell in 1940-41. In other words the present supply level of about 2,800 calories per head per day is for the United Kingdom about marginal.

59. The position in the United Kingdom may thus be broadly summarised as follows :

(*a*) On theoretical grounds average intake requirements have been estimated for the present study at 2,550 calories per head per day. The uncertainties attaching to this estimate have been noted. This represents the requirement of food actually eaten without allowing a margin (necessary in calculating supplies required) to cover losses in cooking, etc., and inequalities in distribution.

(*b*) Under United Kingdom conditions of rationing and control, it appears that supplies of about 2,800 calories per head per day are reasonably adequate but that supplies of about 2,700 calories per head per day are probably too low.

(*c*) The difference of roughly 250 calories per head per day (10 per cent. of the intake requirement) may thus be presumed to represent the necessary margin under conditions of war-time control. An appropriate margin will also be necessary in the case of nutrients.

United Kingdom experience clearly cannot be applied without qualification to other countries, particularly perhaps to countries so different in character as the United States and Canada where equalisation of consumption presents considerably greater problems. Nevertheless it supplements other estimates and, taken in conjunction with evidence from dietary and nutrition surveys, provides a more reliable indication of requirements than could be obtained from the analytical processes taken by themselves.

Economy of Marketing

60. A nation's food policy with respect to utilisation, processing, manufacturing, transportation and marketing also has a marked effect on the quantity of food available for human consumption. Many agricultural products can be used in various ways : as human food, or for feeding to livestock, or for industrial purposes. The extent to which each of these uses may be desirable depends on many factors : one use may be right in one country and another elsewhere, or it may be right in the same country at one time and not at another. Thus, in one part of the world it may be necessary to use grain or sugar for industrial purposes, or to feed livestock on bread grain ; in other areas such uses might be definitely uneconomical. The use of grain for such purposes would reduce the quantity shown as available for human consumption, but no final conclusions could be drawn from such figures without knowledge of the country's food economy. Similarly, figures showing supplies of dairy products available for human consumption cannot be directly interpreted for international food policy purposes without some knowledge of the use which is made of skimmed milk, and of the problems of marketing and transportation involved in bringing the greatest possible proportion of milk into human consumption. The extent to which the by-products of cattle slaughter are made available for human consumption also depends to a large extent on the slaughtering practices followed and on the methods of disposal of the by-products. Throughout the process of food marketing there is inevitably a certain amount of waste. If total supplies are measured at the stage of purchase by the user, it is obviously relevant to examine the amount of the wastage during the course of trade distribution and to endeavour to find out whether it has been reduced to the smallest proportions which circumstances permit.

Economy of Supply

61. The total supplies available to the population of a country will depend upon the efficiency of its management of its home production and, unless it is entirely self-sufficient, of the shipping resources available for bringing in its imports. The quantity and quality of food derived from home production will vary according to the agricultural policy of the Government and the efficiency of the producers ; the agricultural policy will, of course, vary according to climate, soil, farming traditions, availability of manpower, degree of mechanization, etc. With conscious direction of agricultural processes by the Government in accordance with a pre-determined policy, better use of resources may be achieved. For example, by taking steps to see that available fertilizer supplies are applied to land used for the production of essential food crops, rather than for the production of non-essential commodities, food supplies can be increased. Similarly, if an importing country's use of shipping space is wasteful, the supplies actually available will be lower than those potentially available and an uncritical examination of the total supply figures might lead to erroneous conclusions as to the shipping resources which the country needs in order to match its average *per capita* consumption with requirements. Under war-time conditions, substantial changes in production and import policies may be needed in order to make better use of shipping and of such productive resources as land, labour, equipment, fertilizers, livestock, etc. The extent to which these adjustments have been made must be taken into account in assessing, on the basis of statistics of total supplies, how far a country's own resources are adequate or inadequate to meet its dietary requirements.

PART II

FOOD CONSUMPTION LEVELS IN THE UNITED STATES, CANADA AND THE UNITED KINGDOM

NOTE ON TERMS

62. The special terminology adopted in Part I will be followed throughout this report. It may be summarised as follows :—

1. " Individual Intake Allowances " (paragraph 40).

2. " Average (full) Intake Requirements " (paragraphs 41 and 42).

3. " Average (restricted) Intake Requirements " (paragraph 43).

4. " Market Supply Equivalents " (paragraphs 51—56).
   = (*a*) average (restricted) intake requirements*
   + (*b*) necessary waste and distribution margin, viz. :
      (i) allowance for consumption wastes and losses (paragraphs 51—53).
      (ii) allowance for disparities of distribution in relation to needs (paragraphs 54—56).

5. " *Per capita* Supplies " = total quantities of foods, or of nutrients contained in them, moving into civilian consumption, measured at the point where they enter into consumer hands, and divided by the total civilian population. Although the words " *per capita* " and " average " are ordinarily interchangeable the one is consistently used here with " supplies " and the other with " requirements." The term " consumption levels " is also frequently used in this report with the same meaning.

6. " Actual margin between requirements and supplies " = " *per capita* supplies "—" average (restricted) intake requirements."

*Although in this report " market supply equivalents " are related to " average (restricted) intake requirements " the term could equally well be related to " average (full) intake requirements " or to any other average intake requirements that might be selected.

CHAPTER 5

COMPARISON OF NUTRIENT SUPPLIES AND THEIR RELATION TO REQUIREMENTS

Introduction

63. This chapter sets forth the supplies of calories and nutrients contained in the food supplies moving into civilian consumption in each country before the war and in 1943, in relation to estimated requirements. Comparisons between the levels of supply in the three countries are also made. The methods by which the various estimates have been made are set out in the earlier chapters. Thus the statistical basis on which supplies of food moving into civilian consumption have been estimated is described in Chapter 1 ; the factors by which supplies are converted to nutrients are dealt with in the early paragraphs of Chapter 2 ; the basis on which estimates of " average (restricted) intake requirements " for the various nutrients have been calculated is discussed in the latter part of Chapter 2 ; the allowances for consumption wastes and for distribution disparities which must be made in estimating the " market supply equivalents " of the " average (restricted) intake requirements " are explained in Chapter 4. Estimates of the *per capita* quantities of all important nutrients contained, at the time of purchase by the housewife, in the food supplies moving into civilian consumption in each of the countries are given in Table 2 (which is repeated on page 41).

64. Before discussing the results of the analysis that has been made, it is appropriate to state again that both estimated *per capita* supplies of nutrients and estimated average intake requirements may be subject to considerable degrees of uncertainty and error. Small differences between *per capita* supplies of particular nutrients in different countries or between requirements and supplies in the same country are therefore not necessarily of any real significance since they may well be within the limits of statistical error.

Calorie Supplies and Requirements

65. The calorie is merely a measure of the energy derived from one or more of the three basic food nutrients—protein, fat and carbohydrate. A strict comparison of the calorie supplies of the three countries is subject to the limitation of differences in the technical methods used in arriving at the values for each country, resulting in inflated estimates of the United States and Canadian supplies compared with the United Kingdom. This matter is discussed in detail in Appendix IV ; the extent of the over-valuation of the United States figures appears to be of the order of 150 calories per head per day, while the over-valuation of the Canadian figures is about 100 calories per head per day. Therefore, to provide a sounder basis for comparison, modified figures were computed and placed in brackets after the original data in the table. On this basis, the calorie supply available for consumption per head in the United Kingdom is approximately 90 per cent. of that available in the United States, and about 91 per cent. of that available in Canada.

66. For the reasons given in paragraphs 41 and 42 the average calorie requirements of the adult men and women of a nation are difficult to calculate exactly. As the three countries are now fully engaged in the war effort, a greater proportion than in peace-time of the man and particularly the woman-power of the nation is engaged in active work and one would anticipate an increase in the expenditure of calories, reflected in food consumption. This may have been offset to some extent by the transference of many of the younger and more active men and women (who are therefore on the whole bigger eaters) to the Armed Forces and the Auxiliary Services. In this study it has not been possible to obtain evidence on which to estimate how many more calories per day the average adult requires by reason of greater war-time activity.

TABLE 2

ESTIMATED SUPPLIES OF NUTRIENTS AVAILABLE FOR CIVILIAN CONSUMPTION

(per head per day)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Canada 1943 as % of
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.S.A.
Calories	3,228 (3,080)	3,124 (3,020)	2,984	3,283 (3,130)	3,223 (3,120)	2,827	+ 2	+ 3	— 5	86 (90)	88 (91)	98 (100)
Protein—Animal (gm.)	51	49	43	56	57	40	+ 9	+15	— 7	72	71	102
Vegetable (gm.)	38	39	38	39	40	47	+ 3	+ 3	+23	121	116	104
Total (gm.)	89	88	81	95	97	87	+ 7	+10	+ 7	92	90	103
Fat (gm.)	132	122	130	138	133	113	+ 5	+ 9	—13	82	85	97
Carbohydrate (gm.)	420 (380)	417 (390)	373	413 (375)	409 (385)	366	— 2	— 2	—2	89 (98)	89 (95)	99 (103)
Calcium (mgm.)	868	830	694	996	956	1,054	+15	+15	+52	106	110	96
Iron (mgm.)	14	15	13	16	16	16	+14	+10	+27	103	99	104
Vitamin A (I.U.)	6,486	6,133	3,868 (4,700)	6,979	6,783	3,882 (5,000)	+ 8	+11	—	56 (72)	57 (74)	97
Ascorbic Acid (Vitamin C) (mgm.)	99	58	112	106	61	127	+ 7	+ 6	+13	120	208	58
Thiamin (Aneurin or Vitamin B_1) (mgm.)	1.8	1.9	1.2 (1.4)	2.4	2.0	1.9 (2.1)	+37	+ 5	+60	79 (88)	95 (105)	83
Riboflavin (mgm.)	2.0	1.8	1.6	2.3	2.1	2.1	+18	+13	+30	89	98	90
Niacin (Nicotinic Acid) (mgm.)	18	17	18	20	19	19	+14	+ 8	+ 3	92	100	92

NOTES: (1) The figures in the above table and in all other tables in this report are national averages and should not be taken to represent the actual supply received by each individual consumer. No allowance has been made in the above figures for the substantial losses of some nutrients which may occur in storage, preparation and cooking.

(2) The figures in brackets following those for calories and carbohydrates (U.S.A. and Canada) and for vitamin A and thiamin (U.K.) indicate the approximate values if calculated with the same nutrient factors as for the other countries. For these nutrients the methods of estimation in the three countries are not entirely comparable (paras. 65, 75, 79 and 81 and Appendix IV). For other nutrients this difficulty does not arise and the figures may be regarded as comparable.

Similarly, although there are reasons for thinking that the United Kingdom civilian population may, under prevailing conditions, have a larger *per capita* need than that of the United States civilian population because of the more complete mobilisation for war work and the longer hours worked, it is not possible to show the difference quantitatively.

67. No allowances have therefore been made for any differences in average activity before the war and to-day or among the three countries and it is assumed for the purposes of this report that no serious error will be introduced by this assumption. The average intake requirement of each country has therefore been arrived at by classifying all adult men and all adult women other than expectant and nursing mothers as " moderately active," i.e., with a daily requirement of 3,000 and 2,500 calories respectively. By reason of slight differences in the age and sex composition of the populations of the three countries, the average intake requirements for the civilian populations resulting from this assumption are : United States about 2,530 calories ; Canada about 2,540 calories and the United Kingdom about 2,550 calories. It has been assumed that these are the average intake requirements both for the pre-war period and for to-day. If it were felt that the classification of all adults as " moderately active " resulted in understatement, it may be noted that an increase of 100 calories per day in adult requirements would raise the national average in each country by about 70 calories per day.

68. To gain some idea of the possible limits of variation, calculations have been made of the average intake requirements of the United Kingdom civilian population in war-time using scales of allowances for physical activity recommended by other bodies as well as those of the United States National Research Council. The lowest reasonable estimate obtained in this way was 2,400 calories per day and the highest 2,750. Comparison with the calorie equivalent of current *per capita* supplies moving into civilian consumption in the United Kingdom suggests that the latter figure is almost certainly too high.

Margin between Calorie Supplies and Intake Requirements

69. The data in Table 5 present the calorie supplies in relation to requirements. For the pre-war period and for 1943 the supplies relative to requirements are shown to be greater for the United States and Canada than for the United Kingdom. The margin of supplies over requirements has increased slightly from the pre-war period in both Canada and the United States but has fallen somewhat in the United Kingdom.

70. The decline of the calorie value of *per capita* food supplies moving into civilian consumption in the United Kingdom since the war largely reflects the fact that it has proved possible to feed the population with less wastage by a better use of available supplies and it should not be assumed that there has been a reduction in the actual intake. As pointed out in paragraph 56, it is impossible for individuals habitually to eat quantities greatly in excess of their calorie requirements.

71. Broadly speaking the margin between calorie supplies and estimated calorie requirements in the United Kingdom has been cut by two-fifths during the war and is now about 10 per cent. of average requirements. When it is remembered that in addition to kitchen and plate waste, this margin must also provide for any underestimate of calorie requirements and for the inequalities of distribution which are inevitable even in a system which consciously aims to allocate food in accordance with need, it is doubtful if under British conditions the present levels of supplies can be materially reduced. The margin in the United States and Canada is greater than in the United Kingdom but would be expected to show a tendency to decrease if rationing were extended, the food situation became tighter and consumers generally learned to make better use of reduced supplies.

TABLE 5

SUPPLIES OF CALORIES AND PROTEIN PER HEAD PER DAY IN FOOD SUPPLIES MOVING INTO CIVILIAN CONSUMPTION COMPARED WITH AVERAGE INTAKE REQUIREMENTS

	Estimated requirements			Supplies moving into consumption			Supplies as % of requirements		
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.
Calories Pre-war	2,530	2,540	2,550	3,228	3,124	2,984	128	123	117
				(3,080)	(3,020)		(122)	(119)	
1943				*3,283*	*3,223*	*2,827*	*130*	*127*	*111*
				(*3,130*)	(*3,120*)		(*124*)	(*123*)	
Protein (gm.) Pre-war	65	66	65	89	88	81	137	134	125
1943				*95*	*97*	*87*	*146*	*147*	*134*

NOTES: (1) The figures in brackets beneath those for calories (U.S.A. and Canada) indicate the approximate values if calculated on the same basis as for the United Kingdom (see para. 65 and Appendix IV).

(2) While the above estimates may be regarded as approximately correct, any calculation of the margin between calorie supplies and requirements is subject to a considerable degree of error because it is not yet possible to assess average activity, and, therefore, average calorie requirements with any precision. For example, the margin of 11 per cent., shown above for the United Kingdom in 1943, would be increased to 18 per cent. if average requirements proved to be only 2,400 calories. This is the lowest estimate which may be regarded as reasonable (para. 68), and gives some indication of the probable limit of the error.

Total Protein

72. In all three countries *per capita* supplies of protein are well above the average intake requirements computed in this study. (See Table 5.) Even when liberal allowances are made for consumption wastes and distribution disparities they are undoubtedly above the "market supply equivalents" corresponding to these intake requirements. The *per capita* supplies of protein have increased slightly in each country since before the war. The increase in the United States and Canada has been greater than in the United Kingdom where the level is now some 8 per cent. below that in the United States and some 10 per cent. below the Canadian level. The difference is partly offset by the higher waste and distribution margins necessary in the United States and Canada. The increase in protein consumption in the three countries is largely attributable to increased consumption of: dairy products, poultry and fish in the United States; dairy products and meat in Canada; and flour and dairy products in the United Kingdom, these increases more than offsetting the decline in meat. The supplies of protein available for civilian consumption in each country are broken down into supplies from animal products and supplies from vegetable products in Table 6.

Animal Protein

73. Animal products are of great psychological importance to the majority of consumers. Apart from the special nutritional value of animal protein to particular classes of the population and the need of certain minimum requirements for all classes, the importance of this type of protein arises from its relation to the quality of the diet (see Chapter 6). This point is illustrated by a recent resolution of the United States National Research Council (June 14, 1943) which read:

> "There are not sufficient data for stating categorically the minimum amount of protein per day which must come from biologically superior protein foods. The *variety* of protein consumed should be stressed, and

sufficient ' animal protein ' should be included to prevent monotony of the diet to the degree where it might decrease consumption and thus affect nutritional status."

The supplies of animal protein have increased in the United States and Canada by 9 per cent. and 15 per cent. respectively, while in the United Kingdom there has been a decline of 7 per cent. The 1943 supply of animal protein in the United Kingdom is estimated as 28 per cent. less than the United States and 29 per cent. less than the Canadian level. In the opinion of the United Kingdom experts, based on experience during the war, it would be unwise to allow the United Kingdom average level of supply of animal protein to fall below its present level of approximately 40 grammes per day, although it is difficult to state what is the nutritional minimum for animal protein.

Fat

74. There has been an increase in the fat content of the food supplies in the United States since pre-war of 5 per cent. and in Canada of 9 per cent. but a decrease in the United Kingdom of 13 per cent. The United States level is slightly higher than that in Canada and exceeds the United Kingdom level by 18 per cent. In all three countries the proportion of calories derived from fat, visible and invisible is, as shown in Table 10 (in paragraph 91) appreciably above the minimum of 25 per cent. postulated on nutritional grounds (paragraph 45). Fat occurs in the diet in " visible " form as butter, lard, margarine, olive oil, etc., and in " invisible " form in the covering and marbling of meat, in milk and cheese, in peanuts, etc. Whether visible or invisible, fat adds flavour and satiety value to the diet and is of great importance in cooking, and in making dull foods appetizing. (See Chapter 6.)

Carbohydrates

75. The bracketed figures in Table 2 for this nutrient represent adjustments, for comparative purposes, to allow for differences in technical methods of estimation as referred to in paragraph 65, and discussed in detail in Appendix IV. For carbohydrates as such no specific requirement is set by nutrition experts.

Minerals and Vitamins

76. Details of the supply of calcium, iron, vitamin A, ascorbic acid (vitamin C), thiamin (vitamin B_1), riboflavin and niacin (nicotinic acid), available for civilian consumption before the war and in 1943 in each country are given in Table 2. Details of the estimated average national requirements of these nutrients are given in Appendix III. The statistics regarding these nutrients should not be interpreted without a recognition of their limitations ; in particular it should be noted that estimates of requirements and supplies of vitamin A, thiamin, riboflavin and niacin are considerably less reliable than the figures for other nutrients.

Calcium

77. The supplies of calcium in the United States and Canada have risen by about 15 per cent. and those in the United Kingdom by 50 per cent. since pre-war. Approximately one-third of the increase in the United Kingdom is attributable to increased consumption of dairy products ; the remainder is mainly due to the addition of calcium carbonate to flour. In the United States and Canada *per capita* supplies exceed the " average (restricted) intake requirements," and are about equal to the " average (full) intake requirements." United Kingdom supplies are well above requirements on either basis. Since about three-quarters of the total supplies of calcium consumed in the United States and Canada are derived from dairy products, and since wide disparities exist between groups within the population particularly in respect to the quantities of milk they use, it is doubtful, under present patterns of distribution, if the supplies currently moving into civilian consumption are sufficient to provide adequately for the general needs of the nation.

TABLE 6

ESTIMATED SUPPLIES OF PROTEIN AVAILABLE FOR CIVILIAN CONSUMPTION

	Supplies Pre-war gm. per head per day			Supplies 1943 gm. per head per day			Percentage Change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Supplies in Canada 1943 as % of
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.S.A.
Protein from:												
Dairy produce	20	19	14	23	22	18	+17	+18	+31	79	82	96
Meat	20	20	19	20	23	15	— 1	+14	—22	73	65	112
Poultry and fish	6	6	7	7	7	4	+12	+ 5	—38	64	64	100
Eggs	5	4	3	6	5	3	+20	+26	—11	52	57	90
Total animal protein	51	49	43	56	57	40	+ 9	+15	— 7	72	71	102
Grain products	26	29	28	26	30	36	+ 1	+ 4	+26	136	118	116
Pulses and nuts	5	4	3	5	3	2	+ 9	— 8	—22	41	64	65
Other vegetables	7	6	7	8	7	9	+ 8	+ 3	+24	122	132	92
Total vegetable protein ...	38	39	38	39	40	47	+ 3	+ 3	+23	121	116	104
TOTAL PROTEIN	89	88	81	95	97	87	+ 7	+10	+ 7	92	90	103

Iron

78. *Per capita* food supplies in each country now provide considerably more than the "average (full) intake requirement" of about 11.7 milligrammes per day and substantially more than the "average (restricted) intake requirement." The marked increase in iron consumption in the United Kingdom since before the war is largely due to the increased quantity of bread in the diet and the higher extraction now required in the milling of wheat flour. In the United States the increase is primarily due to higher consumption of meat and grain products.

Vitamin A

79. An interpretation of the figures for vitamin A given in Table 2 involves several difficulties. In the first place there are a number of discrepancies between the conversion factors for particular foods in the United Kingdom tables of food values and in those used in the United States and Canada. Another major difficulty arises from the fact that, for plant foods, the United States and Canadian tables, except where based on the results of biological assay, are based on a different beta-carotene (provitamin A) to vitamin A conversion ratio from that used in calculating the values in the United Kingdom tables. This materially affects the data for leafy, green and yellow vegetables, giving them lower values by the United Kingdom procedure. There is reference to the technical details in Appendix IV. At present there is no better means of bringing the vitamin A values on to a more comparable basis than to recalculate the United Kingdom supply figures with the United States conversion factors. This procedure is by no means a satisfactory solution of the difficulty but it is the best that can be done in the circumstances. These recalculations are given in brackets in Table 2. In spite of their limitations the figures are thought to justify the conclusion that there have not been significant changes during the war in the *per capita* amounts of vitamin A provided by the food supplies of the United Kingdom whilst there have been slight increases in the United States and Canada. The *per capita* supplies in the United States and Canada exceed the National Research Council recommended allowances by a reasonable margin while the United Kingdom *per capita* supplies show a smaller margin.

Ascorbic Acid (Vitamin C)

80. The ascorbic acid content of the *per capita* food supply is slightly greater in the United Kingdom than in the United States, and both countries have considerably more than Canada. The Canadian supplies just exceed the "average (restricted) intake requirements" but are appreciably below the "average (full) intake requirements," while the United States and United Kingdom supplies show a substantial excess and are in fact about double the restricted allowance. Even supplies well above the allowances may however be insufficient since there are substantial losses of vitamin C during storage and marketing and in preparation and cooking. Potatoes and other vegetables are particularly subject to these losses. Greater allowances should be made where such sources form a high percentage of the available supplies. The percentage of the total supply in each country derived from potatoes and other vegetables is: for the United States 55 per cent.; for Canada 56 per cent.; and for the United Kingdom 87 per cent. Thus United States and Canadian supplies are less subject to losses than are United Kingdom supplies. Intake levels in the United States, after allowing for these losses, probably still exceed the restricted requirements but may be below the full requirements. Canadian intake levels would certainly fall below even the restricted requirements. Although the low supply of vitamin C thus indicated may still not be scorbutogenic, yet the fact that scurvy does occur in Canada shows that some people get less than their fair share of available supplies or that the losses referred to above are very high. The United Kingdom position in

relation to requirements is probably similar to that in the United States. Whereas, however, the table shows United Kingdom supplies as higher than United States supplies, the greater allowance needed for losses in the former country may eliminate or even reverse this difference.

Thiamin (Aneurin or Vitamin B_1)

81. The figures in brackets in Table 2 for this nutrient represent modified values calculated for the United Kingdom supplies to place them on a more comparable basis in relation to the United States and Canadian data, by adjusting for discrepancies which appear to be due solely to differences in assay techniques used. (The basis for this modification is explained in Appendix IV.) United States supplies are somewhat larger than those in Canada or in the United Kingdom but the difference is not great. Here again a considerable margin is needed to allow for cooking losses which may be as high as 40 per cent. for certain products, but in this case the available supplies are apparently ample to cover this and provide the intake quantities required. There has been a substantial increase in the thiamin supply in the United States and the United Kingdom since before the war—in the United States because three-quarters of the wheat flour is now enriched with this nutrient and in the United Kingdom because the wheat extraction rate has been raised from 70 per cent. to 85 per cent. The slight increase in Canada comes from increased supplies of dairy products and meats.

Riboflavin

82. Subject to the reservations made in paragraph 76, it appears that food supplies in each country at present provide a little over 2 milligrammes per day per person. This is barely equal to the " average (full) intake requirement " but is above the " average (restricted) intake requirement " adopted for this enquiry. It should also be noted that there are reasons for thinking that the full National Research Council allowance for this nutrient may be on the high side. All things considered it seems likely that the *per capita* supplies available in the three countries should be sufficient to prevent any general riboflavin deficiency. Riboflavin supplies in the United Kingdom have increased since the war by 37 per cent. due to the higher wheat extraction rate and to the increased consumption of dairy products. In the United States there has been an increase of about 18 per cent. and in Canada of about 11 per cent.

Niacin (Nicotinic Acid)

83. *Per capita* supplies of niacin have increased to some extent in each country since the pre-war period. Supplies available for consumption in each country are more than sufficient to meet requirements. The marked incidence of pellagra in the southern area of the United States indicates, however, that many individuals are getting far less than their fair share of the available supplies. This situation is an illustration of the fact that, by reason of maldistribution and bad food habits, undernutrition with respect to one or more nutrients may occur despite the availability of a total food supply well in excess of the needs of a population.

CHAPTER 6

COMMODITY SUPPLIES IN RELATION TO GENERAL DIETARY NEEDS

A. Comparison of Supplies Moving into Civilian Consumption by Food Groups

84. The comparison of supplies moving into civilian consumption in the United States, Canada and the United Kingdom is presented first in summarised form in fourteen broad food groups in Table 1 which is repeated on page 49. In order that the figures should be comparable it has been necessary to express the total weights for certain groups in terms of some common denominator other than simple retail weights, e.g., milk and milk products are shown in terms of total milk solids (fat and non-fat). In all such cases the basis is shown in Table 1 and is explained in Appendix I, Section D and in the comments on the more detailed tables (11 to 24) which follow in Section B of this chapter.

85. A comparison of diets on the basis of nutrients alone is incomplete since the palatability and general acceptability of the diet are markedly influenced by the proportions in which the different foods contribute to nutrient intake, as well as by food habits. This aspect has been discussed in general terms in Chapter 3 and is considered in the present section in relation to the actual level of supplies now prevailing in the United States, Canada and the United Kingdom.

86. The figures in Table 7 (summarised from Table 1) indicate that the United Kingdom diet in 1943 is less palatable because of the lack of variety and shortage of accepted foods than that of the other two countries. Thus it will be seen that the food groups in which the present United Kingdom *per capita* supply

TABLE 7

PER CAPITA SUPPLIES IN THE UNITED KINGDOM AS A PERCENTAGE OF SUPPLIES IN THE UNITED STATES AND CANADA, 1943

(Figures in brackets show the corresponding pre-war percentages)

	U.K. *Per Capita* Supplies as percentage of:	
	United States	Canada
Food groups where United Kingdom *per capita* supplies are lower than those of the United States and Canada:		
Milk and milk products	76 (70)	77 (70)
Meat	76 (101)	80 (114)
Poultry and fish	68 (117)	72 (119)
Eggs	56 (69)	61 (80)
Oils and fats	86 (101)	88 (111)
Sugars and syrups	77 (90)	82 (97)
Pulses and nuts	29 (60)	48 (75)
Tomatoes and citrus fruits	23 (53)	38 (92)
Other fruits	50 (62)	72 (117)
Food groups where United Kingdom *per capita* supplies are greater than those in the United States and Canada:		
Potatoes	165 (124)	125 (92)
Leafy, green and yellow vegetables	142 (116)	307 (226)
Other vegetables	98 (78)	196 (143)
Grain products	123 (105)	115 (102)

Note: In the case of beverages (not included in the above table) United Kingdom *per capita* supplies fall between those of the United States and Canada.

TABLE 1

ESTIMATED SUPPLIES MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Canada 1943 as % of
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.S.A.
Milk and milk products, excluding butter Total milk solids (fat and non-fat) ...	55.0	54.6	38.3	64.4	64.3	49.2	+17	+18	+28	76	77	100
Meats including cured and canned and edible offal (as carcase weight) ...	134.9	120.1	136.4	141.3	134.4	107.3	+ 5	+12	—21	76	80	95
Poultry, game and fish (edible weight)...	26.1	25.8	30.6	27.6	26.2	18.8	+ 6	+ 2	—39	68	72	95
Eggs (fresh equivalent)	35.6	30.5	24.4	41.2	37.8	22.9	+16	+24	— 6	56	61	92
Oils and fats (fat content)	45.1	41.2	45.6	44.5	43.6	38.4	— 1	+ 6	—16	86	88	98
Sugars and syrups (sugar content) ...	105.3	97.0	94.5	84.0	79.1	65.0	—20	—18	—31	77	82	94
Potatoes and sweet potatoes	142.7	191.7	177.0	155.1	205.1	255.8	+ 9	+ 7	+45	165	125	132
Pulses and nuts (weight without shell) ...	15.8	12.6	9.5	19.3	11.7	5.6	+22	— 7	—41	29	48	61
Tomatoes and citrus fruits (fresh fruit equivalent)	88.3	51.1	46.8	103.0	61.5	23.2	+17	+20	—50	23	38	60
Other fruits and fruit products (fresh equivalent)	151.3	79.6	93.5	104.1	72.4	52.0	—31	— 9	—44	50	72	70
Leafy, green and yellow vegetables ...	85.7	43.9	99.3	93.4	43.2	132.7	+ 9	— 2	+34	142	307	46
Other vegetables	62.3	34.0	48.6	65.4	32.8	64.4	+ 5	— 4	+33	98	196	50
Grain products	200.7	206.9	211.0	201.2	215.4	247.4	—	+ 4	+17	123	115	107
Beverages (tea, coffee, cocoa)	16.0	10.8	13.5	14.3	10.5	12.3	—11	— 3	— 9	86	117	73

NOTES :—(1) The figures in the above table and in all other tables in this report are national averages and should not be taken to represent the actual supply received by each individual consumer.

(2) Differences between estimates for the United States in this table and estimates published by the Bureau of Agricultural Economics in the January, 1944, issue of the National Food Situation are explained on page 10 of this report.

(3) Including victory garden production.

is lower than that of the other two countries include milk and milk products, meats, poultry and fish, eggs, tomatoes and citrus fruits and other fruits, all foods which are attractive and which contribute appreciably to the intake of animal protein, vitamins or minerals. Also included are sugar and syrups (foods which nutritionally provide only energy but which are highly prized by the consuming public), oils and fat, and pulses and nuts.

87. The food groups in which United Kingdom *per capita* supplies are currently greater than in the United States and Canada are grain products, potatoes and leafy, green and yellow vegetables. Supplies of " other vegetables " are not significantly different from the United States level but considerably greater than those of Canada. The consumption of grain products and potatoes in the United Kingdom has been raised in order to replace the lost supplies of other foods. It is generally recognised that beyond a certain point the higher the proportion of the food intake derived from these groups, the lower the palatability and the greater the bulk of the diet ; this increases the difficulty of securing adequate intakes. The consumption of vegetables has also been stimulated in order to replace the vitamins and minerals lost in other foods.

88. To some extent these differences between the United Kingdom and the North American diets existed before the war, but in general they have become more marked during the war period.

89. Food supplies moving into civilian consumption in Canada in 1943 were close to the level of the United States in the case of seven food groups, including some of the most important. *Per capita* supplies of potatoes were substantially greater than in the United States, but supplies of fruits, vegetables, pulses and nuts and beverages were well below those of the United States. The pre-war relationship between the two countries was substantially the same as in 1943.

TABLE 8

PER CAPITA SUPPLIES IN CANADA AS A PERCENTAGE OF SUPPLIES IN THE UNITED STATES, 1943

(Figures in brackets show the corresponding pre-war percentages)

Food groups for which Canadian supplies are :		
(*a*) More than 10 per cent. below the United States level.	(*b*) Within 10 per cent. of the United States level.	(*c*) More than 10 per cent. above the United States level.
Pulses and nuts ... 61 (80)	Milk and milk products ... 100 (99)	Potatoes ... 132 (134)
Tomatoes and citrus fruits ... 60 (58)	Meat ... 95 (89)	
Other fruits ... 70 (53)	Poultry and fish ... 95 (99)	
Leafy, green and yellow vegetables ... 46 (51)	Eggs ... 92 (86)	
Other vegetables ... 50 (55)	Oils and fats ... 98 (91)	
Beverages ... 73 (68)	Sugars and syrups ... 94 (92)	
	Grain products ... 107 (103)	

90. One special grouping of foods which it is useful to consider together comprises those foods which go to the making of entree dishes, namely : meats, poultry and fish, eggs and cheese. The relative position is shown in Table 9. It is possible to obtain a rough impression of the changes which have occurred in the three countries by totalling the figures in this table, although it must be recognised that, for example, 1 lb. of meat (carcase weight), 1 lb. of fish (filleted weight) and 1 lb. of cheese are not of equal value to the consumer. The picture, however, is not unreasonable and shows that before the war the consumption of these foods was approximately equal at 179 lbs. in the United States and 176 lbs. in the United Kingdom but was lower at 157 lbs. in Canada. In 1943 consumption in the United States was higher at 191 lbs. and in Canada

TABLE 9

SUPPLIES OF ENTREE FOODS MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with pre-war			Supplies in U.K. 1943 as % of	
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada
Whole milk cheese ...	5.6	3.7	8.8	4.9	3.7	11.8	—12	—	+34	240.8	318.9
Meats (*a*)	111.7	97.3	112.4	117.4	110.3	85.5	+ 5	+13	—24	72.8	77.5
Poultry, game and fish (*a*)	26.1	25.8	30.6	27.6	26.2	18.8	+ 6	+ 2	—39	68.1	71.8
Eggs (*b*)	35.6	30.5	24.4	41.2	37.8	22.9	+16	+24	— 6	55.6	60.6

(*a*) As edible weights.

(*b*) Shell egg equivalent.

NOTE: Differences between estimates for the United States in this table and estimates published by the Bureau of Agricultural Economics in the January, 1944, issue of the National Food Situation are explained on page 10 of this report.

it had risen to 178 lbs. In the United Kingdom, on the other hand, consumption had fallen by about one-fifth to 139 lbs. per head per annum. This decrease in supplies of entree foods has increased substantially the culinary difficulties of the British housewife in the preparation of palatable meals.

Proportion of Calories from Different Food Groups

91. Figures for the percentages of the calorie value of a diet derived from each of the major groups of commodities reflect important characteristics of the diet as a whole. As the proportion of calories provided by cereals and vegetables becomes larger, the diet becomes more bulky in character and less palatable. There is a danger that the high intake of starchy foods will correspondingly reduce the consumption of foods providing certain other nutrients. If more than 50 to 60 per cent. of the calories were derived from bread, flour and potatoes it might be expected that people long accustomed to the pre-war diets of the United States, Canada and the United Kingdom would suffer digestive disturbance as a result of the bulky character of such meals. Table 10 shows the percentage of calories derived from each of the different food groups and nutrients in the pre-war period and in 1943 in the United States, Canada and the United Kingdom and may serve as a useful background for the commodity discussions which follow.

92. It will be noted that 32 per cent. of the calories in the United States and 31 per cent. in the Canadian diet are in 1943 derived from animal products (excluding butter and lard) which are more highly esteemed than vegetable products ; this compares with 26 per cent. in the United Kingdom. Before the war the corresponding figure was 28 per cent. in all three countries. The

TABLE 10

PERCENTAGE OF CALORIE SUPPLY FROM DIFFERENT FOOD GROUPS AND NUTRIENTS

	Supplies Pre-war			Supplies 1943		
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.
Food Groups						
Dairy products	12.0	11.6	9.1	13.8	13.2	11.1
Meats	12.8	12.9	16.7	14.1	13.9	12.8
Poultry, game and fish ...	1.6	1.8	1.4	1.9	2.0	1.0
Eggs	1.9	1.7	1.3	2.3	2.0	1.2
Oils and fats	15.4	14.8	17.1	14.3	15.2	15.2
Sugars and syrups ...	14.9	15.4	15.1	12.9	12.2	10.9
Potatoes	4.2	5.5	4.1	4.5	5.7	6.4
Pulses and nuts	2.9	2.1	1.4	2.9	1.7	0.7
Tomatoes and citrus fruits	1.0	0.5	0.4	1.0	0.6	0.2
Fruits (other than citrus fruits)	3.2	2.0	1.7	2.2	1.8	1.0
Leafy, green and yellow vegetables	0.9	0.6	0.5	1.0	0.5	0.7
Other vegetables... ...	0.9	0.6	0.3	1.1	0.5	0.6
Grain products	27.6	30.0	30.1	27.4	30.1	37.4
Cocoa	0.7	0.5	0.8	0.6	0.6	0.8
	100.0	100.0	100.0	100.0	100.0	100.0
Nutrients						
Protein	11 (11)	11 (12)	11	12 (12)	12 (13)	12
Fat	37 (39)	35 (36)	39	38 (40)	37 (38)	36
Carbohydrates	52 (50)	54 (52)	50	50 (48)	51 (49)	52
	100	100	100	100	100	100

Note : The figures in brackets represent the percentage of calories derived from each nutrient if carbohydrates in United States and Canadian supplies are estimated on the United Kingdom basis (see paragraphs 65 and 75 and Appendix IV).

proportion of the calories derived from grain products and potatoes has remained at the pre-war level of 32 per cent. in the United States and 36 per cent. in Canada. The corresponding figure for the United Kingdom is now 44 per cent. compared with 34 per cent. before the war.

B. Comparison of Supplies Moving into Civilian Consumption by Individual Commodities

93. The comparison of consumption levels in lb. per head per annum before the war and in 1943 in the United States, Canada and the United Kingdom which has been made in summary form in Section A of this chapter, is made in fuller detail for individual foodstuffs in the remaining paragraphs of this chapter and in Tables 11 to 24.

Milk and Milk Products (excluding butter)

94. Before comparing the total weights of the items in this group, it is necessary to reduce them to some common denominator; clearly weights of fluid milk added to weights of dried milk have little significance. The total weights consumed have, therefore, been expressed in Table 11 in terms of milk solids (fat and non-fat). This means that each item has been reduced to a dry-weight basis and in the case of sweetened products a deduction has been made for the added sugar leaving only the dry matter derived from the milk used for their production. Before the war Canada and the United States consumed appreciably more of this group than the United Kingdom. There has been an increase in the consumption in the United States of 18 per cent. from 55.0 lb. to 64.4 lb. Canadian consumption has increased by 17 per cent. from 54.6 lb. to 63.7 lb. and there has been a still greater increase in the United Kingdom, viz., 28 per cent. from 38.3 lb. to 49.2 lb. This has narrowed the difference between the United Kingdom and the other two countries but United Kingdom consumption is still about 20 per cent. lower. From the point of view of food planning, it is important to remember in considering this difference in average consumption levels, the greater extent to which it has been possible in the United Kingdom to secure a distribution of fluid milk that relates its use closely to needs.

95. Fluid milk consumpton has risen by 25 per cent. in the United States, 12 per cent. in Canada and by 34 per cent. in the United Kingdom. The increase in the United Kingdom has been brought about, on the consumption side, by the National Milk Scheme (under which milk is provided at low cost to all expectant and nursing mothers and infants and free to the same groups in families with incomes below specified levels), by the provision of cheap or free milk for children at school ($\frac{1}{3}$ or $\frac{2}{3}$ United Kingdom pint on each school day) and by food education and, on the supply side, by restricting the usage of milk for the manufacture of milk products and the feeding of animals. Distribution of fluid milk has been controlled in the United Kingdom by a flexible rationing scheme. The first claim on supplies is for priority consumers of which the main classes are expectant mothers, and children under 5 who receive 7 United Kingdom (=8.4 United States) pints weekly throughout the year and children and adolescents who receive $3\frac{1}{2}$ United Kingdom (=4.2 United States) pints weekly; other priorities are for sufferers from certain diseases, workers in specified industries, etc. These priority requirements are large and in the season of lowest milk production represent a considerable proportion of total supplies. Thus from November 22, 1942, to March 13, 1943, the entitlement of the non-priority consumer was only 2 United Kingdom (=2.4 United States) pints per week. At the point of highest supply, viz., from May 2 to July 3, 1943, the entitlement of the non-priority consumer was 4 United Kingdom (=4.8 United States) pints per week. These quantities were available for almost everyone, but some consumers particularly in rural areas were able to obtain a larger supply.

TABLE 11

SUPPLIES OF MILK AND MILK PRODUCTS (EXCLUDING BUTTER) MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with pre-war			Supplies in U.K. 1943 as % of		Supplies in Canada as % of U.S.A. 1943
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	
Fluid milk	267.0	345.1	217.7	334.3	386.8	291.6	+ 25	+ 12	+ 34	87	75	116
Milk in ice cream	6.0	13.0	(*b*)	9.1	22.5	—	+ 52	+ 73	—	—	—	247
Cream (*c*)	10.7	12.7	2.6	11.8	14.4	—	+ 10	+ 13	—	—	—	122
Cream in ice cream (as 20%)	3.6	—	(*b*)	3.4	—	—	— 6	—	—	—	—	—
Whole milk cheese	5.6	3.7	8.8	4.9	3.7	11.8	— 12	—	+ 34	241	319	76
Evaporated and condensed whole milk	16.8	6.7	6.4	17.0	12.7	2.2	+ 1	+ 90	— 66	13	17	75
Dried whole milk (*a*)	0.2	0.2	0.6	0.4	0.7	0.8	+100	+250	+ 33	200	114	175
Dried skim milk	1.9	1.8	1.0	0.9	2.1	3.6	— 53	+ 17	+260	400	171	233
Condensed skim milk	2.8	0.4	5.9	4.3	0.4	1.6	+ 54	—	— 73	37	400	9
Skim milk cheese	1.6	0.1	—	1.9	0.2	—	+ 19	+100	—	—	—	11
Skim and buttermilk	54.7	2.6	—	61.3	5.2	—	+ 12	+100	—	—	—	8
TOTAL MILK SOLIDS (FAT AND NON-FAT)	55.0	54.6	38.3	64.4	64.3	49.2	+ 17	+ 18	+ 28	76	77	100

(*a*) Includes malted milk in U.S.A. and Canada.

(*b*) Included in liquid milk.

(*c*) Only the total figures are in terms of milk solids. Figures for individual commodities are actual net weights as purchased except for cream which is shown as cream of 20 per cent. fat content for the U.S.A. and U.K. and 18 per cent. fat content for Canada.

NOTE.—Differences between estimates for the United States in this table and estimates published by the Bureau of Agricultural Economics in the January, 1944, issue of the National Food Situation are explained on page 10 of this report.

96. The increased consumption in the United States and Canada has arisen largely from the increasing war-time purchasing power of the public. Retail sales are only partially controlled. Large regional variations of supply exist and very frequently those whose needs are greatest receive much less than the average supply. The figures of fluid milk consumption in Table 11 show Canadian consumption at a substantially higher level than either the United States or the United Kingdom. In Canada since December 16, 1942, a consumer subsidy of 2 cents per quart on fluid milk has been in effect. This has enabled consumers to purchase their requirements at a lower price and has been of particular benefit to low income families.

97. Production of cream has been prohibited in the United Kingdom. In the United States the sale of cream of more than 19 per cent. fat content has been prohibited. In Canada the fat content of cream has been restricted to 18 per cent. Cream consumption in the United States was substantially higher before the war than in the United Kingdom and is expected in 1943 to be slightly above the pre-war level. Consumption of cream in Canada is higher than in the United States and is expected to be materially higher in 1943 than before the war. Pre-war consumption of ice cream was very considerably lower in the United Kingdom than in the United States or Canada. Figures for United Kingdom consumption are not available and any milk and cream used before the war for its manufacture are included under those headings in Table 11. The production of ice cream has been prohibited in the United Kingdom. In the United States the production is limited by restrictions on the quantities of milk solids used for the production of ice cream. In Canada the production of ice cream for domestic sale has been restricted to the level of the year ending March, 1942, and the figures shown in Table 11 for consumption by the civilian population are somewhat high as no information is available to make a deduction for ice cream used in military canteens. The actual amount available for civilians has been reduced. Quality has fallen in both the United States and Canada.

98. The demand for cheese has risen in the United States but in order to make some 30 per cent. of the 1943 production available for Lend/Lease shipments and military requirements, civilian consumption was restricted by points rationing. Cheese consumption in Canada has always been relatively low and the whole of the increase that has taken place in production since the war has been made available to the United Kingdom. In May, 1943, a prohibition was laid on the sale (except for export to the United Kingdom) of factory made cheese manufactured in the provinces of Ontario and Quebec, where approximately 90 per cent. of Canadian cheese is produced. This action has reduced the supply of cheese in Canada below the market demand. United Kingdom consumption has risen by about one-third and is now more than twice the United States level and more than three times the Canadian consumption. Endeavours have been made in the United Kingdom to persuade the British public to accept cheese as a substitute for meat and supplies are rationed with special priority allowances for heavy workers who have no access to works' canteens. The United Kingdom cheese ration for non-priority consumers was 8 ounces per week at the beginning of 1943 and was reduced to 6 ounces in January, to 4 ounces in February and to 3 ounces in May. The average consumption for 1943, therefore, exceeds the current level by some 5 per cent.

99. Evaporated and condensed whole milk consumption was, before the war, approximately equal in United Kingdom and Canada but in the United States consumption was nearly three times that of the other two countries. United Kingdom consumption has been severely reduced whereas in the United States consumption has been maintained, while in Canada the domestic disappearance of these products has almost doubled. These products are rationed under points schemes in both the United Kingdom and the United States. In

Canada sales are controlled providing for guaranteed supplies to preferred users under coupon rationing. There has been a curtailment of amounts of condensed milk available to urban markets where supplies of fluid milk are adequate in order to provide for areas where fluid milk is in limited supply. Condensed skim milk consumption was, before the war, more than twice as great in the United Kingdom as in the United States. In Canada the consumption of this product was negligible. Before the war condensed skim milk was mainly consumed by the lower income groups in both the United Kingdom and the United States. The United Kingdom consumption has been severely cut, and dried skim milk imported to replace it in order to save shipping space. This has involved some problems of consumer acceptance. The United States 1943 consumption has risen appreciably. There is in the United States a considerable consumption of liquid skim and buttermilk but virtually none in the United Kingdom. Farm separation or buttermaking in the United Kingdom is small and skim milk from factory production is used in the production of condensed skim milk and milk powder. Consumption of skim and buttermilk in Canada is also relatively low compared with that of the United States.

Meat (including cured and canned and edible offal)

100. For any comparison of the weights of meats consumed it is necessary, as in the case of milk and milk products, to adopt some common basis for adding together all the types of products, e.g., as carcase weight or as edible weight. Both of these have been used in Table 12. Each is useful for a particular purpose but neither overcomes entirely the inherent difficulties of summation and comparison. For the manufacturer, some 2½ lbs. of carcase meat are required to produce 1 lb. of canned corned beef, although some of the fat from the meat does not go into the canned product and remains available for consumption in or for separate export from the producing country ; the consumer, on the other hand, may well regard 1 lb. of corned beef as an inadequate substitute for 2½ lbs. of carcase meat. It is for this reason that the two bases have been shown in Table 12 ; the difference mainly arises from the canned meats. The carcase weight figures may be regarded as indicating the quantities from the production point of view ; the edible weight quantities as representing the consumer's point of view. Taking the group as a whole the United Kingdom consumption has declined by nearly one-quarter whereas United States consumption prior to rationing, had increased to some extent, with the result that for the year 1943 as a whole, United Kingdom consumption represents 76 per cent. as carcase weight and 73 per cent. as edible weight of the United States consumption. Consumption of meat in Canada was below that of the United States and the United Kingdom during the pre-war period but has increased by 12 per cent. to reach a level close to the United States and considerably above the United Kingdom wartime consumption. The average *per capita* quantities estimated to be available for consumption in 1943 in the United States, Canada and the United Kingdom respectively are : on a carcase weight basis 141.3 lb., 134.4 lb. and 107.3 lb. ; and on an edible weight basis 117.4 lb. ; 110.3 lb. and 85.5 lb.

101. It will be noted that the types of meat eaten in the three countries vary considerably. In comparison with the United States, the United Kingdom has four times as much mutton and lamb but less than half as much pig meat and less than two-thirds as much beef and veal. Canada, like the United States, has a low *per capita* consumption of mutton and lamb but makes up this difference with a higher consumption of beef and veal rather than pig meat. Consumption of pig meat in Canada in 1943 is approximately the same as in the pre-war period but increased consumption of beef and veal has resulted in an over-all increase in meat consumption. Restrictions on the slaughter of hogs for the domestic market in Canada and voluntary reductions

TABLE 12

SUPPLIES OF MEAT (INCLUDING CURED AND CANNED AND EDIBLE OFFAL) MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Supplies in Canada as % of U.S.A. 1943
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	
Beef—Bone in	55.1	54.4	55.6(*a*)	51.9	70.1	23.5(*a*)	— 6	+29	—	—	—	—
Bone out	—	—	1.7	—	—	10.6	—	—	—	—	—	—
Veal	8.1	10.4	—	7.1	9.1	—	—12	—12	—	—	—	128
Total beef and veal (as carcase weight) (*c*)	63.2	64.8	57.7	59.0	79.2	36.8	— 7	+22	—36	62	46	134
Mutton and lamb (*c*)	6.7	5.5	26.9	6.0	5.0	24.0	—10	— 9	—11	400	480	83
Pig meat (*b*) (*c*)	56.5	40.4	38.7	64.3	40.9	26.1	+14	+ 1	—33	41	64	64
Offal	8.5	5.9	6.7	12.0	7.1	5.4	+41	+20	—19	45	76	59
Canned corned meat	(*d*)	—	2.1	(*d*)	—	3.4	—	—	+62	—	—	—
Other canned meat	(*d*)	1.4	0.8	(*d*)	1.0	4.8	—	—29	+500	—	480	—
TOTAL CARCASE WEIGHT	134.9	120.1	136.4	141.3	134.4	107.3	+ 5	+12	—21	76	80	95
TOTAL EDIBLE WEIGHT	111.7	97.3	112.4	117.4	110.3	85.5	+ 5	+13	—24	73	78	94

(*a*) Includes veal. (*b*) Including bacon and ham, and U.S.A. fat pork cuts. (*c*) As carcase weight. (*d*) Included as carcase meat.

NOTE.—Differences between estimates for the United States in this table and estimates published by the Bureau of Agricultural Economics in the January, 1944, issue of the National Food Situation are explained on page 10 of this report.

in pork consumption in order to fill increasingly larger contracts with the United Kingdom arrested advances in consumption which would have occurred as a consequence of increased consumer purchasing power. The restrictions on slaughter for domestic sale were lifted in October, 1943. The consumption of canned meats has risen noticeably in the United Kingdom since the pre-war period, as a partial offset to the decline in carcase meat supplies. The consumption of canned meat in Canada is relatively low compared with that of the United Kingdom. Comparative figures for the consumption of canned meat in the United States are not available as they are included in the carcase meat figures in Table 12, but U.S.A. consumption is restricted in order to free supplies for military requirements and Lend/Lease shipments.

102. The United States meat supplies taken as a whole and taken by major types are, on the average, less fat than those of the United Kingdom. Thus chemical analysis shows that the fat/protein ratio in the meat group for the estimated supplies in 1943 is 1.8 : 1 for the United States and 2.3 : 1 for the United Kingdom. For the purposes of this study the United States figures have been provisionally adopted for Canada in the absence of Canadian analyses. In the case of pig meat supplies (including fat pork cuts) the ratios are 3.5 : 1 in the United States and 3.9 : 1 in the United Kingdom. In all three countries, but probably to a greater extent in the United Kingdom, the quality of meat supplies has fallen. In the United States for instance, hogs are fed to heavier weights producing much fatter animals than before the war ; the abundant supplies of feed grains up to the end of 1942 encouraged this but the feed supply position is now undergoing a fundamental change. In Canada the reduction in quality has occurred only in pork and bacon largely as a result of increased exports of high quality product. The quality of United Kingdom meat supplies has been reduced by a number of factors. The highest quality of pre-war imported beef (chilled beef) is no longer imported and the frozen boneless beef shipped in its stead is a less palatable article. Of home produced meats, the production of high quality beef and early lambs has been discouraged in order to reduce the demand for concentrates and to release bread grains for human consumption. Furthermore to conserve fluid milk for human consumption in the United Kingdom, a much larger proportion of the bull calves are slaughtered as bobby calves (i.e., less than a week old) than before the war. Pigs are now used predominantly for bacon production rather than pork. They are fed in part on swill made from collected food waste and are raised to heavier weights than was formerly the practice.

103. In the United Kingdom, domestic meat purchases are limited by a straight rationing system ; canned meats are on the points scheme ; offals are unrationed, their perishability having proved a serious obstacle to rationing ; sausages, meat pies and other open meat packs are unrationed and are dealt with in the passage on manufactured foods (paragraph 139). In the United States meats, including canned meats, sausages and offals are rationed on a point system which covers fats. In Canada domestic meat purchases are restricted by a straight rationing scheme which includes sausage but excludes offals and certain prepared meats. Up to October, 1943, Canadian pork consumption was restricted by control over the disposition of the commercially slaughtered product and restrictions on local slaughter.

Poultry, Game and Fish

104. To adjust for the considerable variation in the proportion of edible weight to total retail weight between such items as poultry and canned fish, the tables for this group have been expressed in terms of edible weight. Taking the group as a whole it will be observed that consumption has risen by 7 per cent. in the United States and by 2 per cent. in Canada, whereas consumption in the United Kingdom has fallen by 39 per cent. and now amounts to about 70 per cent. of the United States and Canadian levels. The total edible weights

TABLE 13

SUPPLIES OF POULTRY, GAME AND FISH MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with pre-war			Supplies in U.K. 1943 as % of		Supplies in Canada as % of U.S.A. 1943
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	
Chickens (*b*)	18.0	15.5	4.1	28.2	18.7	2.7	+57	+21	—34	9	12	66
Other poultry (*b*)	2.7(*a*)	2.7		3.4(*a*)	4.7		+26	+74				138
Game and rabbits (*b*)	2.0	4.3	3.7	2.0	4.3	2.5	—	—	—32	125	58	215
Fish (fresh, frozen and cured) fresh fillet basis	6.3	8.8	19.9	3.8	4.5	11.0	—40	—49	—45	289	244	118
Shell fish (without shell)	1.1	.4	1.3	1.0	.3	0.9	— 9	—25	—31	90	300	30
Canned fish	5.0	2.7	3.6	2.5	4.4	3.0	—50	+63	—17	120	68	176
TOTAL (EDIBLE WEIGHT)	26.1	25.8	30.6	27.6	26.2	18.8	+ 6	+ 2	—39	68	72	95

(*a*) Turkeys. (*b*) Dressed carcase weight.

NOTE: Differences between estimates for the United States in this table and estimates published by the Bureau of Agricultural Economics in the January, 1944, issue of the National Food Situation are explained on page 10 of this report.

estimated to be available for consumption per head of the civilian population in 1943 are 28.0 lb. in the United States, 26.2 lb. in Canada and 18.8 lb. in the United Kingdom.

105. The consumption of each item has fallen in the United Kingdom whereas there has been a considerable increase in poultry consumption in both the United States and Canada. The United States pre-war consumption of poultry was five times as great as that of the United Kingdom and in 1943 it is expected to be roughly 12 times as great. Canadian consumption, while not as high as in the United States was approximately 4½ times the United Kingdom consumption pre-war and in 1943 was roughly 10 times as great. The increases in the United States and Canada may be attributed to a higher demand combined with the ready availability of feed grains during the early years of the war and the possibility of effecting a rapid increase in poultry numbers. It should, however, be noted that while poultry may be regarded as a substitute for meat in rural areas, it tends to be both expensive and scarce in urban areas and in these areas, it does not serve so well for that purpose in lower income households.

106. The average pre-war United Kingdom consumption of fish (other than canned fish and shell fish) was more than three times as great as that in the United States and more than twice that of Canada; in 1943 it is still over 2½ times the United States level and more than double the Canadian figures. The consumption of canned fish has, as a matter of policy, been much more severely reduced in the United States than in the United Kingdom. Consumption in Canada, however, has increased on the basis of current estimates. Canned salmon, however, was not being made available to civilian consumers in Canada throughout 1942 and 1943 as the entire pack was consigned to the United Kingdom. None of the items in this group is rationed with the exception of canned fish in the United States and United Kingdom, but fresh fish, other than herring is subject to controlled distribution in the United Kingdom.

Eggs and Egg Products

107. In terms of shell eggs, supplies in 1943, as calculated at the end of the third quarter, are equivalent to 183 eggs per head per annum in the United Kingdom, 302 in Canada and 330 in the United States. This represents a decline of 6 per cent. compared with the pre-war period in the United Kingdom, but an increase of 24 per cent. in Canada and of 16 per cent. in the United States. More than half the total United Kingdom supply is now in the form of dried egg and supplies of shell eggs as such have fallen by 56 per cent. In Canada and the United States supplies are almost entirely in the form of shell eggs. In spite of increased total production in these two countries, there was, late in 1943, some tendency for shell eggs to be in short supply, particularly in urban areas, as a result of rising purchasing power and increased demand, combined with the seasonal drop in production.

108. A large proportion, estimated at 52 per cent. of the United Kingdom supply of shell eggs is from domestic poultry keepers or that part of the production of small commercial producers which does not pass through controlled distribution. The British authorities have not yet been able to find a satisfactory method of securing a greater proportion of the shell egg production for controlled distribution, and *per capita* shell egg consumption by poultry keepers is appreciably greater than the entitlement of the non-priority United Kingdom consumer. On the remaining 48 per cent. which does pass through controlled distribution, priority consumers (expectant mothers, children and invalids) have first claim. Thus the urban non-priority consumer in the United Kingdom receives only some 29 shell eggs per annum. The United Kingdom consumption of dried eggs has almost entirely replaced (on the straight national average) the fall in shell egg consumption. While the British public feels the loss of shell eggs as some hardship, dried eggs are nutritionally the equivalent of shell eggs and only slightly more limited in their culinary uses. Both shell

ggs and dried eggs are subject to a flexible form of rationing in the United Kingdom. The consumption of shell eggs is not subject to restriction in the United States or Canada. Dried eggs are not available to the United States domestic consumer and only to a very limited extent in Canada.

Visible Fats.

109. The title for this group has been chosen in order to make a distinction between fats sold as such and the total fat in the diet. The latter includes also the "invisible fats," e.g., in meats, fish, cheese and milk. The quantities of visible fats entering into civilian consumption have been expressed both in weights as purchased and in terms of fat content (i.e., excluding moisture content and added salt); the addition of this second basis was desirable as the moisture content varies appreciably between the different products, and also to a lesser extent, between the forms of the same product as they are sold in the three countries. Taking the group as a whole, consumption in terms of fat content has increased by 6 per cent. in Canada, but has declined by 1 per cent. in the United States and 16 per cent. in the United Kingdom. Thus United Kingdom consumption which, before the war was slightly higher, is expected to be 14 per cent. lower than United States consumption in 1943 and 12 per cent. lower than that of Canada. The total fat content of the quantities available for consumption (including manufacturing and catering usages as well as domestic purposes) is estimated for 1943 as 44.5 lb. in the United States, 43.6 lb. in Canada and 38.4 lb. in the United Kingdom.

110. Butter consumption before the war was about 50 per cent. greater in the United Kingdom than in the United States, but only about 80 per cent. of that of Canada. Consumption has been reduced by 21 per cent. in the United States and 69 per cent. in the United Kingdom, while there has been only a small decline in Canada. The British average consumption is now 57 per cent. of American but only 26 per cent. of the Canadian level. The level of butter consumption in Canada is among the highest of all countries in the world, but the sale of margarine is prohibited in Canada. The United Kingdom has lost its pre-war European sources of supply, but is at present importing all the supplies of butter available to her. None of the British supply of butter is imported from the United States. Margarine consumption in the United Kingdom has been nearly doubled to make good the loss of butter. With the high quality of present day margarine and the compulsory fortification of all that is sold for household use with Vitamins A and D, the wartime shift in the United Kingdom has been made without serious hardship to the consumer. The United Kingdom consumption of margarine is now nearly four times as great as that of the United States. For butter and margarine combined, the United Kingdom 1943 consumption is estimated at 24.9 lb. as compared with the United States figure of 17.6 lb. and the Canadian figure of 29.6 lb. The United States consumes on a *per capita* basis almost twice as much lard and other shortening as the United Kingdom, and uses slightly greater quantities of other fats. Canadian consumption of lard and shortening is midway between the United Kingdom and the United States, but consumption of other oils and fats is relatively low in that country. The higher consumption of lard and shortening and other oils in the United States brings that country's total for visible fats above that of the United Kingdom and slightly below that of Canada. Lard is, however, a fat more limited in its uses than either margarine or butter.

111. All domestic supplies of fats are rationed in the United Kingdom and the United States, with the minor exceptions of peanut butter and salad cream. In the United Kingdom, however, neither of these is consumed in anything like the same quantities as in the United States. In the United Kingdom, visible fats are rationed separately, with a total entitlement of 8 ounces per head per week. In the United States they are rationed on points. In Canada

TABLE 14

SUPPLIES OF EGGS AND EGG PRODUCTS MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Supplies in Canada as % of U.S.A. 1943
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	
Fresh	35.6(*a*)	30.1	21.8	41.2(*a*)	37.5	9.7	+16	+25	—56	24	26	91
Dried	—	0.1	0.05	—	0.06	2.8	—	—40	—	—	—	—
Liquid egg	—	—	1.9	—	—	0.2	—	—	—90	—	—	—
TOTAL (SHELL EGG EQUIVALENT):												
Lb. per head	35.6	30.5	24.4	41.2	37.8	22.9	+16	+24	— 6	56	61	92
Number per head	285	244	195	330	302	183	+16	+24	— 6	55	61	92

(*a*) Breakdown of U.S.A. supplies not available, but practically all are shell eggs.

TABLE 15

SUPPLIES OF VISIBLE FATS MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Supplies in Canada as % of U.S.A. 1943
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	
Butter	16.8	30.8	24.8	13.3	29.6	7.6	—21	— 4	—69	57	26	223
Margarine	2.9	—	9.0	4.3	—	17.3	+48	—	+92	402	—	—
Lard	11.0	4.0	9.3	13.8	9.1	11.8	+26	+128	+27	52	67	66
Shortening	11.9	10.5		8.7	8.4		—27	—20				97
Other fats and oils (*a*)	6.3	1.8	8.2	7.7	2.1	5.6	+22	+17	—32	73	267	27
TOTAL (ACTUAL WEIGHT)	48.9	47.1	51.3	47.8	49.2	42.3	— 2	+ 4	—18	88	86	103
(FAT CONTENT)	45.1	41.2	45.6	44.5	43.6	38.4	— 1	+ 6	—16	86	88	98

(*a*) Animal and vegetable fats and oils used for human food, except those separately specified or used for the manufacture of margarine or shortening.

NOTE: Differences between estimates for the United States in these tables and estimates published by the Bureau of Agricultural Economics in the January, 1944 issue of the National Food Situation are explained on page 10 of this report.

butter is rationed under a straight rationing scheme at 8 ounces per head per week. Supplies for commercial manufacturing purposes are obtainable in all three countries only against permits and allocations have been restricted to considerably below the pre-war level (see also section on manufactured foods, paragraphs 135 to 139).

Sugars and Syrups

112. For the purpose of comparison, the total figures for this group have been expressed in terms of sugar content. Table 16 indicates that, for the group, as a whole United States pre-war consumption was higher than that of either the United Kingdom or Canada. Consumption has, by 1943, been cut somewhat more heavily in the United Kingdom than in the United States or Canada, and United Kingdom consumption for 1943 stands at 77 per cent. of the United States and 82 per cent. of the Canadian level. By weight in terms of sugar content, the 1943 estimates, including sugar in manufactured foods as well as sugar used as such by the consumer, are 84.0 lb. in the United States ; 79.1 lb. in Canada, and 65.0 lb. in the United Kingdom.

113. Sugar adds very considerably to the attractiveness of a diet, and is an inexpensive and relatively non-bulky source of energy, but it does not contribute any other nutrients than carbohydrates to the diet. It is an important ingredient in such manufactured foods as cakes and biscuits (cookies). In all three countries the supplies available to manufacturers have been controlled and curtailed (see section on manufactured foods, paragraphs 135 to 139). The restricted supply of sugar for domestic consumption and the parallel limitation of domestic fat supplies (combined in the case of the United Kingdom with the increased need for spreads for bread by reason of the increased bread consumption) limits, in all three countries, the baking and cooking housewives can do in their homes. Sugar is rationed at 8 ounces per head per week in the United States, Canada and the United Kingdom. In Canada and the United States considerable additional supplies were made available during the home canning season.

Potatoes and Sweet Potatoes

114. The current United Kingdom consumption of potatoes exceeds that of the United States by 65 per cent. and that of Canada by 25 per cent. For 1943, it is estimated at 255.8 lb. in the United Kingdom as compared with 155.1 lb. for the United States and 205.1 lb. for Canada. These figures include allotment and garden production, and include sweet potatoes in the United States and Canada.

115. Pre-war consumption of white potatoes was much higher in Canada than in the United Kingdom or the United States. The long winter, with relatively few alternative vegetables, was responsible for this difference. In 1943 United States and Canadian consumption was from 7 to 10 per cent. above pre-war, whereas there had been a 45 per cent. increase in the United Kingdom. In the early months of 1943, potatoes were in short supply in the United States, and serious shortages occurred in many areas. In the United Kingdom there has been an intensive campaign to increase potato consumption and to make ample potato supplies available at all times of the year. This policy was adopted both because of their vitamin C content and because potatoes were a crop with a high yield per acre, home production of which could be substantially increased. Before the war the United Kingdom imported early new potatoes from Europe, Mediterranean countries, the Channel Islands and the Canaries. These imports have been discontinued in wartime, and old potatoes remain the only type available until several weeks later in the year than pre-war. In these extra weeks during which old potatoes are consumed, their quality falls rapidly as the weather becomes warmer and their vitamin C content, after long storage, is lower than that of the new potatoes which were formerly eaten at that season of the year.

NOTE : Differences between the figures in this section and those in the section on the National Food Situation are explained on page 10 of this report.

TABLE 16

SUPPLIES OF SUGARS AND SYRUPS MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Supplies in Canada as % of U.S.A. 1943
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	
Cane and beet sugar (*c*)	91.5	90.6	89.5	69.6	72.1	62.1	—24	—20	—31	89	86	104
Corn and maple sugar; glucose (*c*) ...	2.6	1.8	5.6	2.6	1.7	2.1	—	— 6	—62	81	124	65
Syrups	13.0	1.0	(*a*)	13.8	1.4	(*a*)	+ 6	+40	—	—	—	38
Edible molasses		3.7			3.9			+ 5				
Honey	1.4	2.4	0.4	1.4	2.8	0.3	—	+17	—25	21	11	200
Jams, jellies, marmalades and apple butter	2.9	—	0.1(*b*)	3.2	—	1.5(*b*)	+10	—	—	47	—	—
TOTAL (SUGAR CONTENT)	105.3	97.0	94.5	84.0	79.1	65.0	—20	—18	—31	77	82	94

(*a*) Included under cane and beet sugar.

(*b*) Imported only: Home produced jam included under sugar and fruit.

(*c*) These figures do not represent the total consumption of sugar. They exclude sugar in canned fruit and vegetables and in condensed milk which are shown elsewhere in the statistical tables. They also exclude sugar used for brewing and distilling, except in the U.S.A., where sugar used for this purpose amounted to only 0.18 lb. per head in 1935/39 and 0.20 lb. in 1943. Sugar in unfermented drinks and in those manufactured foods not shown specifically in the statistical tables is included.

NOTE: Differences between estimates for the United States in this table and estimates published by the Bureau of Agricultural Economics in the January, 1944, issue of the National Food Situation are explained on page 10 of this report.

TABLE 17

TABLE 17

SUPPLIES OF POTATOES AND SWEET POTATOES MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Supplies in Canada as % of U.S.A. 1943
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	
White potatoes	123.2	191.1	177.0	135.0	204.7	255.8	+10	+ 7	+45	189	125	152
Sweet potatoes	19.5	0.6	—	20.1	0.4	—	+ 3	—33	—	—	—	2
TOTAL	142.7	191.7	177.0	155.1	205.1	255.8	+ 9	+ 7	+45	165	125	132

NOTE: Differences between estimates for the United States in this table and estimates published by the Bureau of Agricultural Economics in the January, 1944, issue of the National Food Situation are explained on page 10 of this report.

TABLE 18

SUPPLIES OF PULSES AND NUTS MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Supplies in Canada as % of U.S.A. 1943
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	
Dry beans	8.9	3.6	7.3	10.8	4.9	3.6	+21	+36	—51	30	35	45
Dry peas	1.2	5.6		1.3	5.4		+ 8	— 4				415
Soya beans	—	0.1	—	0.5	0.1	—	—	0	—	—	—	20
Soya flour and grits	—	—	—	—	—	1.7	—	—	—	—	—	—
Peanuts (*a*)	4.3	2.2	2.2	5.8	1.2	0.3	+35	—45	—86	4	23	21
Tree nuts (*a*)	1.4	1.1		0.9	0.1		—36	—91	—	—	—	11
TOTAL	15.8	12.6	9.5	19.3	11.7	5.6	+22	— 7	—41	29	48	61

(*a*) Weight without shell.

NOTE: Differences between estimates for the United States in this table and estimates published by the Bureau of Agricultural Economics in the January, 1944, issue of the National Food Situation are explained on page 10 of this report.

116. There is, in the United States, an additional consumption of sweet potatoes which are not grown in the United Kingdom. Small quantities of these potatoes are imported into Canada from the United States. These are nutritionally superior to white potatoes, containing more than twice as much ascorbic acid and having also a high vitamin A content.

Pulses and Nuts

117. Beans, peas, lentils and nuts are nutritious and economical foods, but consumption of the group as a whole has fallen to about 60 per cent. of the pre-war level in the United Kingdom, and slightly below the pre-war level in Canada. In the United States there has been an increase of 22.0 per cent. over pre-war consumption. For 1943, United Kingdom consumption is estimated at about one-third of United States consumption and one-half that of Canada. The actual weights of supplies expected to be available in 1943 are 19.3 lb. in the United States ; 11.7 lb. in Canada ; and 5.6 lb. in the United Kingdom. It should, however, be noted that imports of nuts into the United Kingdom, other than supplies for crushing as oilseeds and small quantities for vegetarians, have been discontinued for shipping reasons, and that shipping difficulties and the occupation by the enemy of sources of supply, have reduced United Kingdom supplies of those pulses which are familiar to and favoured by the British consumer.

118. The pre-war consumption of pulses (dried beans, peas and lentils) was some 25 per cent. less in the United Kingdom than in the United States and 20 per cent. below that of Canada. Consumption has increased by 25 per cent. in the United States and by 12 per cent. in Canada, but has fallen by 51 per cent. in the United Kingdom since before the war. In Canada the consumption of beans has increased. Consumption of peas has declined slightly, but is still relatively high, particularly in Quebec, where pea soup is a favoured dish. The United Kingdom figures in Table 18 do not, however, show the whole story, in that they represent releases at the wholesale stage, and in 1941 and 1942 there were heavy releases of dried beans in the United Kingdom which accumulated at the retail point of distribution. Both beans and peas are rationed under the points scheme in the United Kingdom, and beans are rationed similarly in the United States. No restrictions on consumption exist in Canada. The figures in Table 18 include allocations for the manufacture of canned baked beans. Production of this article was prohibited for a time in the United States and Canada in order to save steel and tinplate, but has recently been resumed at a restricted level. Production has been maintained in the United Kingdom because canned baked beans in tomato sauce are used in Britain as an entree course, and the provision of main dishes is one of the housewife's chief problems.

119. The figure shown for soya flour and grits for the United Kingdom in 1943 covers the usage of full fat flour for manufacturing purposes, particularly by bakers, and the usage for compulsory inclusion, as from July 25, 1943, of 7½ per cent. of low fat soya grits in sausages and sausage meat.

120. The consumption of nuts in the United States before the war was more than twice that of the United Kingdom or Canada, largely because of the greater consumption of peanuts in America. The import of nuts into the United Kingdom has been discontinued and consumption in 1943 has fallen to 14 per cent. of the pre-war level ; it now stands at 4 per cent. of the United States level. Reduced imports have also lowered the consumption of nuts in Canada by 60 per cent.

Tomatoes and Citrus Fruit

121. Taking this group as a whole, estimated civilian supplies (expressed as fresh fruit equivalent) have risen by 16 per cent. in the United States, by 20 per cent. in Canada, but have fallen by 50 per cent. in the United Kingdom. The consumption of all items in the group has increased in the United States with the exception of canned tomatoes and tomato products. There has been a substantial increase in the consumption of citrus fruits in Canada, but a

TABLE 19

SUPPLIES OF TOMATOES AND CITRUS FRUIT MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Supplies in Canada as % of U.S.A. 1943
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	
Fresh tomatoes	21.3	8.3	10.9	25.3	6.9	11.0	+19	—17	+ 1	43	159	27
Canned tomatoes and tomato products (*b*)	12.1(*a*)	9.9	2.0	11.4(*a*)	9.8	0.1	— 6	— 1	—95	1	1	86
Fresh citrus fruit	42.8	25.0	28.5	49.6	37.6	2.2	+16	+50	—92	4	6	76
Canned citrus fruit and citrus juices (as unconcentrated) (*b*)	3.0	0.5	2.2	5.5	0.1	4.9	+83	—80	+123	89	4,900	2
TOTAL (FRESH FRUIT EQUIAVALENT)	88.3	51.1	46.8	103.0	61.5	23.2	+17	+20	—50	23	38	60

(*a*) Pack year basis. (*b*) Net edible weight.

NOTE: Differences between estimates for the United States in this table and estimates published by the Bureau of Agricultural Economics in the January, 1944, issue of the National Food Situation are explained on page 10 of this report.

TABLE 20

SUPPLIES OF FRUIT (OTHER THAN CITRUS FRUIT) MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Supplies in Canada as % of U.S.A. 1943
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	
Fresh fruit	112.1	40.3	51.1	75.0	39.1	22.6	—33	— 3	—56	30	58	52
Fresh pulp (imported)	—	—	2.2	—	—	2.0	—	—	— 9	—	—	—
Canned fruit (*c*)	17.4(*a*)	6.3	10.2	10.8(*a*)	3.5	3.3	—38	—44	—68	31	94	32
Frozen fruit	0.7	0.2	—	1.4	0.2	—	+100	—	—	—	—	14
Dried fruit (*d*)	5.7(*b*)	8.2	8.0	4.5(*b*)	7.4	6.2	—21	—10	—22	138	84	164
TOTAL (FRESH FRUIT EQUIVALENT) ...	151.3	79.6	93.5	104.1	72.4	52.0	—31	— 9	—44	50	72	70

(*a*) Includes juices other than citrus which are on a pack year basis. (*b*) Pack year basis. (*c*) Net edible weight. (*d*) Actual weight.

NOTE: Differences between estimates for the United States in this table and estimates published by the Bureau of Agricultural Economics in the January, 1944, issue of the National Food Situation are explained on page 10 of this report.

relatively low tomato crop in 1943 reduced supplies of fresh tomatoes and tomato products. In the United Kingdom there have been sharp falls in supplies of citrus fruit and tomato products, but supplies of fresh tomatoes have been maintained and the consumption of citrus juices has increased, though they are for the most part issued only to infants and expectant mothers.

122. The United Kingdom has discontinued imports of tomatoes, but has endeavoured to make good the loss by increased home production. When the estimated garden and allotment production is taken into account as well as commercially grown supplies, the annual United Kingdom consumption appears to have been restored to about the pre-war level, although the availability of supplies is much more limited to the summer and autumn than before the war. Fresh citrus fruits are imported into the United Kingdom only where shipping cannot be used to better effect, since they represent very bulky cargo, having a very high water content. These changes would have had an adverse effect on United Kingdom vitamin C intake had the consumption of potatoes and other vegetables not been promoted as a substitute. The loss, however, has seriously reduced the palatability of the British diet and the public certainly does not regard the increased consumption of vegetables as replacing the lost supplies of fruit. Canada is mainly dependent on the United States for imports of citrus fruits. In contrast, the United States produces her own requirements and supplies are mainly dependent on crop yields. Relatively small quantities of tomatoes are also imported into Canada during the winter months but the price to consumers places these in the luxury class. In addition difficulties of transportation during the long winter season make the movement of fruits and vegetables a difficult problem in many Canadian areas.

123. In the United States, the canned items in this group are rationed on the points scheme but the fresh products are distributed without control. In the United Kingdom, fresh tomatoes are subject to controlled distribution but not rationed ; oranges are subject to controlled distribution and sale is limited for the first 5 days to expectant mothers and children under 5. Citrus juices (except for a very small quantity going to the manufacture of soft drinks) are distributed under the Welfare Foods' Scheme, solely to expectant mothers and infants. Such small quantities of canned tomatoes and canned fruits as were available in 1943 were distributed on the points scheme. Allocations of tomato purée to manufacturers are controlled by permit.

Fruit (Other than Citrus Fruit)

124. The total supplies for this group have again been expressed as fresh fruit equivalents and Table 20 indicates consumption for the group as a whole as having fallen in all three countries in 1943 as compared with pre-war—in the United States by 31 per cent., in Canada by 9 per cent. and in the United Kingdom by 44 per cent. In 1943 the United Kingdom consumption was 50 per cent. of the United States and 72 per cent. of the Canadian level. It should, however, be noted that the fall shown in the case of the United States is in part due to a poor crop yield in 1943, whereas the United Kingdom figures reflect another heavy crop year. The Canadian tree fruit crop was below average in 1943 and production of small fruits was also relatively low.

125. Fresh fruit rationing has not been found practicable. In Britain much of the commercial crop has been reserved for jam making and imports have been discontinued ; hothouse production has been severely limited and the space redirected to tomato production. Measures have been taken to improve the distribution over the country of the remaining supply, while at the same time eliminating unnecessary cross hauls. The United Kingdom supply of fresh fruit has thus fallen to half the pre-war level and 30 per cent. of the United States level, and the supply available in fresh form to the domestic consumer has fallen to an appreciably greater extent. In addition, with the loss of luxury fruits and imported supplies, the supply which remains is

very limited in variety, consisting mainly of plums and apples and is also limited in season of availability to the summer and autumn months. The considerable pre-war imports of bananas and pineapples into the United States have been much reduced and the production of berries has been curtailed but otherwise changes have been mainly due to crop fluctuations. Imports of bananas and pineapples into Canada have been at a much reduced level but in spite of this and the short crop in 1943 total supplies of fresh fruit are only about 3 per cent. below the pre-war average largely because ot a reduction in exports.

126. Canned fruit consumption in the United Kingdom before the war was 59 per cent. of the United States level but above that of Canada. In 1943, United Kingdom consumption is expected to represent some 30 per cent. of the United States and to be about the same as that of Canada. Consumption of dried fruit has fallen in all three countries—by 21 per cent. in the United States, 10 per cent. in Canada and 22 per cent. in the United Kingdom. In the United Kingdom dried fruits are largely used in cakes, puddings, etc., which are primarily made from flour ; with the increased war-time flour consumption, their contribution to palatability is important. Dried fruits are particularly important in the United States and Canada for certain isolated population groups, e.g., in mining camps and on ranches. Both canned and dried fruit in the United States and the United Kingdom are rationed under points schemes. Frozen fruit (of which no supplies are now available in the United Kingdom) is rationed under the same scheme in the United States. In Canada canned fruit is rationed under the preserves rationing scheme which provides for purchases of other commodities as well as canned fruit. Dried fruit is under an allocation plan but is limited at the consumer level only by the shortage of supplies.

Leafy, Green and Yellow Vegetables

127. Supplies of the items in this group total about 133 lb. in 1943 in the United Kingdom and exceed the United States supplies by 42 per cent. and the Canadian estimate by 200 per cent. The United Kingdom private production of the vegetables in the group is estimated to have risen from some 30 lb. per head pre-war to some 45 lb. in 1943, largely as a result of the " dig for victory " campaign. The increase in garden and allotment production is proportionately greater than the increase in commercial production. The peak may, however, well have been reached, since manpower has largely been drawn off into the Services and industry and the calls on leisure time (Home Guard, etc.) have greatly increased.

128. In the case of all of the fresh vegetable items in this group supplies have risen appreciably in the United Kingdom and with the exception of carrots to a smaller extent in the United States. In Canada, with the exception of carrots, consumption in 1943 is below pre-war. The increases in fresh vegetable consumption in the United Kingdom have been the result of a direct policy of stimulating consumption in order to increase the intake of the protective nutrients. In the case of carrots in particular, an intensive campaign was undertaken to improve the vitamin A position. To make possible this increase in vegetable consumption, action has been taken in the United Kingdom to stimulate the production of nutritionally desirable vegetables giving a high yield for a low labour complement and to discourage the production of less desirable crops. It should, however, be noted that while vegetables may be nutritionally a substitute for the lost supplies of imported fruits, they are not so regarded by the United Kingdom consumer. There is in the United Kingdom a limited range of fresh vegetables in the winter and early spring months, when little is available other than cabbage and spring greens. Supplies of canned vegetables in the United Kingdom are too small to provide any appreciable variety.

TABLE 21

SUPPLIES OF LEAFY, GREEN AND YELLOW VEGETABLES MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Supplies in Canada as % of U.S.A. 1943
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	
Fresh cabbage and greens	49.5	16.1	77.2	50.8	15.9	97.8	+ 3	— 1	+27	193	615	31
Carrots	10.1	15.3	12.4	9.8	17.6	21.3	— 3	+15	+72	217	121	180
Fresh legumes	14.4	6.1	8.6	17.1	3.2	12.6	+19	—48	+47	74	394	19
Canned vegetables (net edible weight)...	11.7(*a*)	6.4	1.1	15.7(*a*)	6.5	1.0	+34	+ 2	— 9	6	15	41
TOTAL	85.7	43.9	99.3	93.4	43.2	132.7	+ 9	— 2	+34	142	307	46

(*a*) Includes baby foods. Pack year basis.

NOTES: (1) Including victory garden production.

(2) Differences between estimates for the United States in this table and estimates published by the Bureau of Agricultural Economics in the January, 1944, issue of the National Food Situation are explained on page 10 of this report.

TABLE 22

SUPPLIES OF OTHER VEGETABLES MOVING INTO CIVILIAN CONSUMPTION (a)

(lb. per head per year)

	Supplies Pre-War			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Supplies in Canada as % of U.S.A. 1943
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	
Fresh	54.5	29.6	47.6	55.3	28.1	64.0	+ 1	— 5	+34	116	228	51
Canned (net edible weight)	7.8	4.4	1.0	10.1	4.7	0.4	+29	+ 7	—60	4	9	47
TOTAL	62.3	34.0	48.6	65.4	32.8	64.4	+ 5	— 4	+33	98	196	50

(*a*) Other than leafy, green and yellow vegetables.

NOTES: (1) Including victory garden production.

(2) Differences between estimates for the United States in this table and estimates published by the Bureau of Agricultural Economics in the January, 1944, issue of the National Food Situation are explained on page 10 of this report.

129. Canadian supplies of fresh vegetables, again with the exception of carrots, are low. The short growing season and high cost of imports make it difficult to obtain fresh vegetables other than roots during a large part of the year. In the United States a greater variety is possible, because of the varying climatic conditions and production seasons in the different regions of the sub-continent.

130. Fresh vegetables are not rationed in any of the countries, but in the United States and the United Kingdom measures have been taken to prevent unnecessary use of transport in their distribution. Canned vegetables are rationed under the points system in the United States. In the United Kingdom canned peas, of the vegetables included in this group, are rationed under the points scheme. Other canned vegetables in this group are unrationed but consumption is small and production rigorously controlled. There has been no rationing of these products in Canada but the 1943 pack was not released for sale to the public until November 15. The flow of supplies is controlled at the wholesale and retail levels.

Grain Products

131. Consumption of the group as a whole has remained virtually unchanged in the United States and has increased by 4 per cent. in Canada and 17 per cent. in the United Kingdom. The significance of this increase may be somewhat obscured in this section by the use of percentages ; the group contributes slightly over one-third of total calorie intake in the United Kingdom and a little less than one-third in the United States and Canada ; an increase of 17 per cent. in United Kingdom consumption thus represents a very considerable change in the diet. By weight the 1943 consumption of all of the items in this group is estimated at 201.2 lb. per head for the United States, 215.4 lb. for Canada and 247.4 lb. for the United Kingdom.

132. Flour represents much the largest item in this group and alone contributes about one-third of the United Kingdom calorie supply. Consumption has remained unchanged in the United States but has increased by 6 per cent. in Canada and by 18 per cent. in the United Kingdom. A considerable increase in bread consumption in the United Kingdom has been necessitated by the shortage of other foods. To encourage this, supplies of sweet and other bread-spreads have been increased as far as possible. Thus the consumption of commercially produced jam has risen from 10.1 lb. per head before the war in the United Kingdom to 15.8 lb. per head in 1943. (This may slightly overstate the increase in consumption, since, with the rationing of sugar, domestic jam making has undoubtedly fallen.) In the United States the consumption of bread has been encouraged by increased allocations of sugar for the manufacture of jams and jellies and of peanuts for the manufacture of peanut butter.

133. There have been considerable changes in the United Kingdom wartime flour, which cannot be shown in Table 23. Pre-war flour in the United Kingdom was a white flour of some 70 per cent. extraction. The 1943 flour in the United Kingdom is of 85 per cent. extraction from a grist containing 10 per cent. of diluent flour from barley, oats and rye. This wartime flour has a significantly higher vitamin content and contains added calcium. It produces a bread of slightly darker colour and smaller bulk and immediately after its introduction, there was considerable public complaint against the high extraction flour. Millers and bakers have succeeded with experience in improving both the flour and the bread made from it and the British public now accepts it without any appreciable complaint as a wartime necessity. Ample supplies of wheat being available in the United States and Canada, it has not been necessary to impose any restriction on rates of flour extraction and the flour consumed is mostly of 70 per cent. extraction. In the United States flour is enriched with thiamin, niacin and iron and since October 1, 1943, riboflavin. The

1944, issue of the National Food Situation are explained on page 10 of this report.

TABLE 23

SUPPLIES OF GRAIN PRODUCTS MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Supplies in Canada as % of U.S.A. 1943
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	
Flour (including rye flour)	158.1	183.5	195.0	158.5	194.9	229.9	—	+ 6	+18	145	118	123
Oatmeal	3.9	7.3	5.2	4.5	7.6	10.3	+15	+ 4	+98	229	136	169
Rice	6.2	4.3	4.4	5.9	4.0	3.4	— 5	— 7	—23	58	85	68
Starch	1.4	2.2	2.2	2.2	2.0	1.1	+57	— 9	—50	50	55	91
Cornmeal	24.0	1.4	—	21.0	0.5	—	—12	—64	—	—	—	2
Other cereal foods	7.1	8.2	4.2	9.1	6.4	2.7	+28	—22	—36	30	42	70
TOTAL	200.7	206.9	211.0	201.2	215.4	247.4	—	+ 4	+17	123	115	107

NOTE: Differences between estimates for the United States in this table and estimates published by the Bureau of Agricultural Economics in the January, 1944, issue of the National Food Situation are explained on page 10 of this report.

TABLE 24

SUPPLIES OF TEA, COFFEE AND COCOA MOVING INTO CIVILIAN CONSUMPTION

(lb. per head per year)

	Supplies Pre-war			Supplies 1943			Percentage change 1943 compared with Pre-war			Supplies in U.K. 1943 as % of		Supplies in Canada as % of U.S.A. 1943
	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	U.K.	U.S.A.	Canada	
Tea	0.7	3.5	9.3	0.4	2.1	7.4	—43	—40	—20	1,850	352	525
Coffee	11.8	3.6	0.7	11.3	4.0	0.9	— 4	+11	+29	8	22	35
Cocoa (beans)	3.5	3.7	3.5	2.6	4.4.	4.0	—26	+19	+14	154	91	169
TOTAL	16.0	10.8	13.5	14.3	10.5	12.3	—11	— 3	— 9	86	117	73

NOTE: Differences between estimates for the United States in this table and estimates published by the Bureau of Agricultural Economics in the January, 1944, issue of the National Food Situation are explained on page 10 of this report.

wartime changes in cakes, biscuits and cereal breakfast foods are dealt with in the section on manufactured foods (paragraphs 135 to 139). In Canada a new flour called "Vitamin B White Flour (Canada Approved)" has been introduced, which is defined only according to thiamin content (400 International Units per pound, a value which corresponds to about 80 per cent. extraction).

134. The consumption of oatmeal has risen moderately in the United States and Canada and has been nearly doubled in the United Kingdom. This latter increase was brought about to stimulate the consumption of a valuable food which could be produced in Britain but the extent of the increase in human consumption may be slightly overstated, since with the close control exercised over supplies of animal feedingstuffs, some oatmeal may be purchased for feeding of backyard poultry. The considerably reduced supplies of rice in the United Kingdom are issued under the points scheme and supplies to manufacturers have been greatly reduced, substitutes being used wherever practicable, e.g., for rice flour, etc. Supplies have, as far as possible, been directed to uses for which rice is essential, and to domestic consumption. Allocations of starch for the manufacture of starch food powders (custard and blanc mange powders, cornflour, etc.) have in the United Kingdom been reduced from the pre-war level and some shortages have developed; these products have not, however, been rationed. None of the items in this group is rationed in United States or Canada and only rolled oats (a small part of the oatmeal in Table 23), rice, cereal breakfast foods and biscuits are rationed in the United Kingdom on the points scheme.

Manufactured Foods

135. All the figures in the preceding tables include both supplies for domestic purchase and supplies for manufacturing uses. This affects particularly flour, sugar, fats and meat, of which an appreciable proportion of the supply is allocated for manufacturing purposes and eaten in compound foods.

136. Allocations of sugar and fats for the production of bakery products have been reduced in all three countries. In the United Kingdom restrictions have been imposed, limiting the fat and the sugar content of cakes and flour confectionery and prohibiting the addition of any substances after baking (with the exception of filling in sponge sandwich and sponge rolls). By these measures it has been possible to maintain and even increase the total production of cakes, while greatly reducing the usage of fats and sugar. The attractiveness and palatability of these foods have, however, been severely reduced; this has discouraged demand sufficiently for it to be possible to leave them unrationed. Allocations of fats and sugar for biscuits have been curtailed in all three countries. In the United Kingdom, the output of biscuits has also been controlled and severely reduced and biscuits are rationed under the points scheme. The reduced quantity now available is considerably less attractive in quality than were pre-war biscuits. In the United States and Canada the variety and fat and sugar content of bakery products have been reduced.

137. For shipping economy reasons, imports of cereal breakfast foods into the United Kingdom have been discontinued but home production has been more than doubled providing a total supply some 1½ times as great as before the war. The shortage of other breakfast dishes has greatly increased demand and these foods are rationed on the United Kingdom points scheme. In addition, a zoning scheme has been introduced, in consequence of which the varieties obtainable in any one area are limited. The use of maize in their manufacture has been prohibited and replaced by wheat which gives a higher yield but a less familiar product.

138. In all three countries, allocations of sugar and fats for the production of chocolate and sugar confectionery have been reduced. In the United Kingdom supplies are rationed at 12 ounces per head per 4 weeks.

issue of the National Food Situation are explained on page 10 of this report.

139. Allocations of meat for the production in the United Kingdom of sausages, meat pies and other open meat packs have been greatly reduced. The meat content of sausages has been prescribed at 37½ per cent. with a small tolerance above and below. This represents a very considerable reduction of the average meat content. As from July 25, 1943, all sausages must contain in addition 7½ per cent. low fat soya grits, which will appreciably increase their nutritive value. Thus all the United Kingdom meat products (which are unrationed—demand and supply being reasonably equated as a result of the considerable fall in quality) are very much less attractive and palatable than the pre-war articles. In the United States 100 per cent. meat content is still legally enforced for sausages but they are rationed under the points system. In Canada sausages must not contain more than 5 per cent. by weight of cereal and are included in the meat rationing scheme.

CHAPTER 7

TRENDS OF SUPPLIES

140. The data given in the Appendix tables on supplies in the pre-war period, in each of the years 1940, 1941, 1942 and 1943 and, for the United States and the United Kingdom, on forecast supplies in the year July, 1943 to June, 1944, are summarised in Tables 25 and 26. The material given in these tables is presented in chart form in Charts 3 and 4 in the Summary. The first table summarises the supplies in pounds per head per year moving into civilian consumption ; the second summarises the available nutrient supplies.

United States

141. In the United States, the years 1940 and 1941 were marked by substantial increases in available supplies of dairy products, meats, oils and fats, sugars and syrups, tomatoes and citrus fruits. In consequence the number of calories available *per capita* was 7 per cent. greater in 1941 than in 1935-39, and supplies of each nutrient were also appreciably larger. Both 1940 and 1941 were years of rapidly rising industrial activity and they were also pre-war years for the United States. The greater agricultural production, induced by increased purchasing power and rising prices, went very largely into civilian consumption.

142. The entry of the United States into the war at the end of 1941 marked a turning-point in food policy. Imports of sugar, coffee, fruits and oils were sharply reduced. While food production in the United States continued to increase through 1943, much larger quantities of food were allocated to the armed forces and to allied nations under the Lend/Lease programme. Sugar was rationed in 1942 and meats, fats, oils, canned fruits and vegetables early in 1943. The result was a decline in the calorie position, which by the end of 1943 stood only slightly above the 1935-39 level. It will be noted that the decline was entirely in fats and carbohydrates. Supplies of animal protein increased slightly between 1941 and 1943, decreases in meats and fish being offset by increases in poultry, eggs and fluid milk.

143. Supplies of minerals and vitamins continued to rise after 1941 and by 1943 were above the 1935-39 level by amounts ranging from 8 per cent. for vitamin A to 37 per cent. for thiamin. The most important factors in this increase were the enrichment of flour with iron, thiamin and niacin, and the substantial increase in fluid milk consumption. Larger supplies of tomatoes and potatoes also made an appreciable contribution, particularly as regards ascorbic acid.

Canada

144. The main feature of the Canadian figures has been a fairly steady increase in supplies over the whole period up to 1943, particularly in milk, eggs and meat. The figures for 1940 suggest some decline in the consumption of grain products which is reflected in the nutrient figures for carbohydrates and

vegetable protein but this may be more apparent than real and due to the utilisation of stocks accumulated by retailers and consumers in the latter half of 1939 ; this would not be brought out in the supply figures which do not measure stocks below the wholesale levels.

145. The steady increase in food supplies moving into civilian consumption resulted, as in the United States, from the increased agricultural production to meet war-time requirements and the increased purchasing power, particularly of the lower income groups, as a result of the mobilisation of Canada's industrial resources. By 1942 employment in Canada had reached an all time peak.

146. The effect of rationing does not become evident in the Canadian figures until 1942 and 1943. A marked fall in sugar consumption was brought about in 1942, and in 1943 butter rationing reversed the upward trend in consumption of fats. Meat rationing, at a fairly generous level, was introduced in May, 1943, but the effect of rationing on consumption will not be evident until the 1944 figures are available. Rationing presents particular difficulties in Canada as in the United States in view of the large rural population and high proportion of self-suppliers, except for purely imported commodities such as the beverage group.

147. The improvement in supplies of vitamins and minerals has in general been less marked in Canada than in the other two countries, except in so far as those associated with milk products are concerned, e.g., calcium. The marked increase in supplies of vitamins A and C in 1942 largely reflects the heavy crop of vegetables in that year, but it cannot be said with certainty how much of the additional supply was actually consumed and the figures must therefore be interpreted with caution. Reference has already been made to the low level of vitamin C supplies in Canada throughout the years under review.

United Kingdom

148. From the United Kingdom figures it is seen that the effect of rationing was already evident in 1940, when there were sharp falls in the consumption of meat, fats and sugar in comparison with pre-war. There was also a reduction in the consumption of some other foods, particularly fruit.

149. The period of greatest food shortage was reached in the first half of 1941 when supplies moving into civilian consumption were equivalent to only 2,680 calories, 33 grammes of animal protein and 105 grammes of fat per day. This is not brought out in the table as the figures for the calendar year 1940 are raised by the less stringent conditions at the beginning of the year and those for 1941 by the improvement which resulted when Lend/Lease supplies began to reach consumers in the second half of the year. During the period of greatest shortage there were indications that the British diet was inadequate.

150. From 1942 onwards *per capita* supplies of the main nutrients have remained remarkably constant with a calorie supply level of rather more than 2,800 per head per day, though there have been some shifts and adjustments between commodities.

151. There have, however, been a number of improvements in the position so far as vitamins and minerals are concerned. Thus supplies of thiamin, riboflavin, niacin and iron rose sharply in 1942 when the extraction rate of flour was raised to 85 per cent. Supplies of calcium also rose in 1942, as a result partly of the increased supplies of milk and milk products and partly of the decision to fortify flour with calcium. The increased production of vegetables, including potatoes, is reflected in a marked improvement in supplies of vitamin C, though the improvement is certainly overstated in the figures because of the serious losses to which vitamin C from these sources is subject in storage, preparation and cooking. The increased production of green vegetables has also been of importance in restoring vitamin A supplies to approximately the pre-war level, though there is some difficulty in interpreting these figures because of the doubt as to the value of carotene in terms of International Units of vitamin A.

TABLE 25

ESTIMATED SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION IN THE UNITED STATES, CANADA AND THE UNITED KINGDOM

PRE-WAR—1943-44

		Lb. Per Head Per Annum						Percentage of Pre-war					
		Pre-war	1940	1941	1942	1943	1943-44	Pre-war	1940	1941	1942	1943	1943-44
Milk and Milk Products (excluding butter). Total Milk Solids ... (fat and non-fat)	U.S.A.	55.0	57.1	58.8	61.4	64.4	61.5	100	104	107	112	117	112
	Canada	54.6	57.0	57.6	61.1	64.3	(a)	100	104	105	112	118	(a)
	U.K.	38.3	38.0	40.5	48.6	49.2	48.8	100	99	106	127	128	127
Meat including cured and canned and edible offal ... ... (as carcase weight)	U.S.A.	134.9	151.9	152.7	153.4	141.3	144.1	100	113	113	114	105	107
	Canada	120.1	120.1	126.5	127.8	134.4	(a)	100	100	105	106	112	(a)
	U.K.	136.4	117.2	102.5	110.8	107.3	108.6	100	86	75	81	79	80
Poultry, game and fish ... ... (edible weight)	U.S.A.	26.1	25.3	27.3	26.3	27.6	28.2	100	97	105	101	106	108
	Canada	25.8	27.4	23.3	26.9	26.2	(a)	100	106	90	104	102	(a)
	U.K.	30.6	22.7	20.5	20.8	18.8	18.9	100	74	67	68	61	62
Eggs ... ... (fresh equivalent)	U.S.A.	35.6	37.9	37.3	37.5	41.2	39.5	100	106	105	105	116	111
	Canada	30.5	30.3	30.5	32.1	37.8	(a)	100	99	100	105	124	(a)
	U.K.	24.4	22.7	18.3	20.5	22.9	25.1	100	93	75	84	94	103
Oils and fats ... ... (fat content)	U.S.A.	45.1	47.2	48.5	45.8	44.5	41.1	100	105	108	102	99	91
	Canada	41.2	41.1	44.3	46.7	43.6	(a)	100	100	108	113	106	(a)
	U.K.	45.6	40.7	40.0	40.3	38.4	37.9	100	89	88	88	84	83
Sugars and syrups... ... ... (sugar content)	U.S.A.	105.3	99.9	113.0	99.1	84.0	87.0	100	95	107	94	80	83
	Canada	97.0	101.9	106.0	84.8	79.1	(a)	100	105	109	87	82	(a)
	U.K.	94.5	70.4	63.1	65.6	65.0	66.6	100	74	67	69	69	70
Potatoes and sweet potatoes ...	U.S.A.	142.7	139.6	134.2	137.7	155.1	148.7	100	98	94	96	109	104
	Canada	191.7	202.4	202.0	204.4	205.1	(a)	100	106	105	107	107	(a)
	U.K.	177.0	178.8	204.6	248.6	255.8	255.8	100	101	116	140	144	144

TABLE 25 (*continued*)

ESTIMATED SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION IN THE UNITED STATES, CANADA AND THE UNITED KINGDOM PRE-WAR—1943-44

		Lb. per Head Per Annum						Percentage of Pre-war					
		Pre-war	1940	1941	1942	1943	1943-44	Pre-war	1940	1941	1942	1943	1943-44
Pulses and nuts (weight without shell)	U.S.A.	15.8	16.1	15.1	16.8	19.3	21.3	100	102	96	106	122	135
	Canada	12.6	12.7	12.2	13.6	11.7	(*a*)	100	101	97	108	93	(*a*)
	U.K.	9.5	6.7	7.2	6.5	5.6	6.1	100	70	76	68	59	64
Tomatoes and citrus fruits (fresh fruit equivalent)	U.S.A.	88.3	101.7	111.0	106.9	103.0	115.2	100	115	126	121	117	130
	Canada	51.1	57.9	64.0	68.8	61.5	(*a*)	100	113	125	135	120	(*a*)
	U.K.	46.8	31.5	16.8	28.1	23.2	23.6	100	67	36	60	50	50
Other fruits and fruit products (fresh equivalent)	U.S.A.	151.3	156.2	149.5	127.8	104.1	101.1	100	103	99	84	69	67
	Canada	79.6	88.1	95.1	70.0	72.4	(*a*)	100	111	119	88	91	(*a*)
	U.K.	93.5	75.5	48.4	70.4	52.0	55.1	100	81	52	75	56	59
Leafy, green and yellow vegetables	U.S.A.	85.7	89.3	88.3	93.4	93.4	94.3	100	104	103	109	109	110
	Canada	43.9	42.3	43.6	61.9	43.2	(*a*)	100	96	99	141	98	(*a*)
	U.K.	99.3	98.2	112.5	125.8	132.7	132.7	100	99	113	127	134	134
Other vegetables	U.S.A.	62.3	59.7	65.9	67.1	65.4	66.1	100	96	106	108	105	106
	Canada	34.0	31.1	27.4	41.3	32.8	(*a*)	100	91	81	121	96	(*a*)
	U.K.	48.6	41.2	51.0	61.0	64.4	64.0	100	85	105	126	132	132
Grain products	U.S.A.	200.7	198.4	198.8	202.7	201.2	200.9	100	99	99	101	100	100
	Canada	206.9	175.0	180.5	195.4	215.4	(*a*)	100	85	87	94	104	(*a*)
	U.K.	211.0	226.1	255.8	244.8	247.4	249.2	100	107	121	116	117	118
Beverages (tea, coffee, cocoa)	U.S.A.	16.0	17.6	18.0	14.6	14.3	17.4	100	110	112	91	89	109
	Canada	10.8	11.9	12.8	10.5	10.5	(*a*)	100	110	119	97	97	(*a*)
	U.K.	13.5	15.5	14.7	13.9	12.3	11.8	100	115	109	103	91	87

(*a*) Canadian data for 1943-44 not available.

NOTES: (1) The figures in the above table and in all other tables in this report are national averages and should not be taken to represent the actual supply received by each individual consumer.

(2) Differences between estimates for the Unites States in this table and estimates published by the Bureau of Agricultural Economies in the January, 1944, issue of the National Food Situation are explained on page 10 of this report.

(3) Including victory garden production.

TABLE 26

ESTIMATED SUPPLIES OF NUTRIENTS AVAILABLE FOR CIVILIAN CONSUMPTION IN THE UNITED STATES, CANADA AND THE UNITED KINGDOM

PRE-WAR—1943-44

		Supplies Per Head Per Day						Percentage of Pre-war					
		Pre-war	1940	1941	1942	1943	1943-44	Pre-war	1940	1941	1942	1943	1943-44
Calories	U.S.A.	3,228 (3,080)	3,357 (3,210)	3,462 (3,310)	3,392 (3,240)	3,283 (3,130)	3,271 (3,120)	100	104	107	105	102	101
	Canada	3,124 (3,020)	3,045 (2,940)	3,149 (3,050)	3,178 (3,080)	3,223 (3,120)	(a)	100	97	101	102	103	(a)
	U.K.	2,984	2,772	2,795	2,864	2,827	2,854	100	93	94	96	95	96
Animal protein (gm.)	U.S.A.	51	55	56	57	56	55	100	107	109	111	109	108
	Canada	49	51	51	54	57	(a)	100	102	103	109	115	(a)
	U.K.	43	39	36	41	40	40	100	89	84	94	93	94
Vegetable protein (gm.)	U.S.A.	38	38	38	38	39	41	100	101	102	102	103	110
	Canada	39	35	36	39	40	(a)	100	90	92	99	103	(a)
	U.K.	38	41	47	48	47	46	100	108	124	125	123	120
Total protein (gm.)	U.S.A.	89	92	94	95	95	96	100	104	106	107	107	109
	Canada	88	86	87	93	97	(a)	100	97	98	105	110	(a)
	U.K.	81	80	83	89	87	86	100	98	102	109	107	106
Fat (gm.)	U.S.A.	132	142	144	140	138	138	100	108	109	106	105	105
	Canada	122	125	130	135	133	(a)	100	102	106	110	109	(a)
	U.K.	130	118	112	117	113	114	100	92	86	90	87	88
Carbohydrate (gm.)	U.S.A.	420 (380)	428 (390)	452 (415)	440 (400)	413 (375)	414 (375)	100	102	108	105	98	99
	Canada	417 (390)	395 (370)	408 (385)	399 (375)	409 (385)	(a)	100	95	98	96	98	(a)
	U.K.	373	347	365	364	366	371	100	93	98	98	98	100

TABLE 26 (*continued*).

TABLE 26 (*continued*).

ESTIMATED SUPPLIES OF NUTRIENTS AVAILABLE FOR CIVILIAN CONSUMPTION IN THE UNITED STATES, CANADA AND THE UNITED KINGDOM PRE-WAR—1943-44

		Supplies Per Head Per Day						Percentage of Pre-war					
		Pre-war	1940	1941	1942	1943	1943-44	Pre-war	1940	1941	1942	1943	1943-44
Calcium (mgm.)	U.S.A.	868	910	931	976	996	975	100	105	107	112	115	112
	Canada	830	853	867	928	956	(*a*)	100	103	104	112	115	(*a*)
	U.K.	694	675	705	854	1,054	1,052	100	97	102	123	152	152
Iron (mgm.)	U.S.A.	14	14	14	15	16	18	100	100	104	106	114	127
	Canada	15	14	15	16	16	(*a*)	100	97	99	109	110	(*a*)
	U.K.	13	13	13	16	16	16	100	100	102	123	127	127
Vitamin A (I.U.)	U.S.A.	6,486	6,785	6,869	6,970	6,979	6,769	100	105	106	107	108	104
	Canada	6,133	6,152	5,782	7,693	6,783	(*a*)	100	100	94	125	111	(*a*)
	U.K.	3,868	3,320	3,634	3,857	3,882	3,932	100	86	94	100	100	102
		(4,700)	(4,100)	(4,500)	(4,900)	(5,000)	(5,100)						
Ascorbic Acid (Vitamin C) (mgm.)	U.S.A.	99	104	104	104	106	114	100	105	106	106	107	116
	Canada	58	58	62	66	61	(*a*)	100	101	107	115	106	(*a*)
	U.K.	112	107	102	122	127	127	100	95	91	109	113	113
Thiamin (Aneurin or Vitamin B_1) (mgm.)	U.S.A.	1.8	1.9	1.9	2.0	2.4	2.5	100	108	106	113	137	139
	Canada	1.9	1.9	2.0	2.0	2.0	(*a*)	100	99	101	105	105	(*a*)
	U.K.	1.2	1.3	1.3	1.8	1.9	1.9	100	108	112	147	160	159
		(1.4)	(1.5)	(1.5)	(2.0)	(2.1)	(2.1)						
Riboflavin (mgm.)	U.S.A.	2.0	2.1	2.1	2.1	2.3	2.4	100	105	107	109	118	123
	Canada	1.8	1.9	1.9	2.0	2.1	(*a*)	100	101	103	110	113	(*a*)
	U.K.	1.6	1.6	1.6	2.0	2.1	2.1	100	101	100	123	130	132
Niacin (Nicotinic Acid) (mgm.) ...	U.S.A.	18	19	19	19	20	22	100	107	108	108	114	124
	Canada	17	18	18	18	19	(*a*)	100	102	103	106	108	(*a*)
	U.K.	18	17	17	18	19	19	100	97	93	101	103	106

(*a*) Canadian data for 1943-44 not available.

NOTES : (1) The figures in the above table and in all other tables in this report are national averages and should not be taken to represent the actual supply received by each individual consumer. No allowance has been made in the figures for the substantial losses of some nutrients which may occur in storage, preparation and cooking.

(2) The figures in brackets following those for calories and carbohydrates (U.S.A. and Canada) and for vitamin A and thiamin (U.K.) indicate the approximate values if calculated with the same nutrient factors as for the other countries. For these nutrients the methods of estimation in the three countries are not entirely comparable (paras. 65, 75, 79 and 81 and Appendix IV). For other nutrients this difficulty does not arise and the figures may be regarded as comparable.

STATISTICAL METHODS EMPLOYED IN THE UNITED STATES

A. Production

The chief bench mark for most of the American supply data used in this report is the Census of Agriculture which is taken every five years and which enumerates acreage and yields of farm crops, numbers of livestock, and other important farm statistics. The Census covers all staple items of farm production. A " farm " is defined by the Census as a " tract of land of three or more acres, or producing agricultural products to a value of $250 or more a year."

Taken by enumerators after the fact, the Census is subject to memory bias. On some items for which monthly and annual data are very good, it has been shown to be incomplete. It does not include home or market garden production or off-farm production which must be estimated in other ways. Despite these obvious inadequacies, the quinquennial Census is an important source of data, and is used to set the level of production for many crops.

The central fact-finding agency of the United States Department of Agriculture on all agricultural statistics is the Crop Reporting Board, and the associated statistical segment* of the Bureau of Agricultural Economics. With the single exception of the data on fish, the Enquiry draws on these basic reports of the Board and the Bureau for data on supplies and stocks. The fact collecting and estimating operations are carried on through the office of Federal Agricultural Statisticians located in 41 States, three of which serve more than one State, including one for the six New England States. These offices secure much of their current information through the co-operation of some 300,000 voluntary crop reporters. An important characteristic of all American data is the many sources from which statistics are drawn to check the basic data received from the producers. These checks have been developed over a period of years so that even when the sample is small, reliability is assured.

Dairy Products

1. Estimates of production of whole milk† are based on sample returns showing numbers of milk cows and milk produced on individual farms. The number of milk cows on farms in the United States and milk production are estimated currently for each month. Estimates of average number of milk cows on farms, yearly milk production and quantities of milk used for all purposes are prepared annually for each State. The annual estimates of milk production usually check closely with the sum of the current monthly estimates. The annual estimates of production and utilisation of milk in each State are reviewed and compared with the indications of commercial milk deliveries, dairy products manufactured, records of market milk administrations, Census enumerations and other records. In general, the estimates for the main commercial dairy areas appear to have been quite accurate but estimates of production and utilisation have been less precise for areas where only a few cows are kept and where most of the milk is used on the farms.

The Department of Agriculture's yearly figures on numbers of milk cows as well as the basic inventory estimates of " cows and heifers 2 years old and older, kept for milk, on farms January 1 " are based on information from various sources, including monthly reports from crop correspondents, quarterly reports from dairy correspondents, semi-annual rural carrier livestock surveys,

*Washington and field organisation of the Division of Agricultural Statistics.

†" Milk Production " is defined as all cows' milk drawn, whether marketed, used on farms, or fed on farms but excludes milk spilled, wasted or sucked by calves.

annual records in some states of cows assessed for taxation, numbers enumerated by assessors, or numbers tested or inspected for disease, and Census enumerations at 5 year intervals. The monthly reports from crop correspondents show numbers of milk cows, numbers being milked and daily production the first of each month on about 23,000 farms. The quarterly reports from dairy correspondents show current production, milk utilisation, and factors affecting production on about 6,000 farms producing milk in commercial quantities. The livestock surveys secure records of numbers of milk cows and daily milk production on 175,000 typical farms, the data being collected each June and December on cards distributed and collected by rural mail carriers. The assessment and inspection records vary between States in completeness and classification. The Census enumerations have been made at varying dates and for various age limits and classifications, but they provide basic information regarding numbers of farms keeping cows and number of cows milked.

Production per cow estimates are based on one day's production reported monthly by crop correspondents, one day's production reported quarterly by special dairy correspondents, and one day's production reported on rural carrier livestock survey records. Allowances are made for the fact that records secured from the first two sources are from better than average skilled progressive farmers with larger herds than are typical.

There is no current check on off-farm milk production, which is believed to be under 3 per cent. of the total milk produced. This is estimated by carrying forward figures based on the Census of 1920 and on the 1930 Census enumeration of non-farm livestock in sample counties.

Data on disposition are possibly somewhat less exact than that on production. Amounts retained on farms for human consumption, for feeding to livestock, for making farm butter or for sale as cream or whole milk are based chiefly on quarterly reports from the dairy correspondents and annual reports on farm butter production by crop correspondents. Estimated quantities sold are checked with amounts required to produce the manufactured dairy products and the amounts used in fluid consumption.

Estimates of the quantities of milk used for each purpose after it leaves the farm are based chiefly on reports from plants handling milk. In some States all plants receiving milk from farmers are required to report to State authorities but elsewhere the reports cover only plants manufacturing dairy products. For this reason the indicated quantities sold for fluid consumption in some areas are a residual after known utilisations are deducted from estimated deliveries. Further checks on fluid milk consumption are provided in towns of 25,000 people or less by yearly questionnaires to Boards of Health or other local agencies on the amount of milk received and used for fluid consumption, in some of the large city areas by reports from Federal milk marketing agreement areas on fluid milk coming into the region ; and from some milk marketing areas under State control.

Monthly estimates are published currently on the production of condensed and evaporated milk, creamery butter, American cheddar cheese and dried milk products based upon a large and well-distributed sample of dairy manufacturers. Complete enumerations are made each year showing the monthly and annual output of all dairy products such as butter, cheese, evaporated milk, condensed milk, ice cream, etc. The more than 11,000 dairy product manufacturing plants in the country co-operate fully in these enumerations. There is also a weekly report on butter production showing the percentage change from the previous week and the corresponding week a year earlier. A similar weekly report is issued for American cheddar cheese.

Meat

2. Basic data on the number of meat animals on farms are from the quinquennial census. Year to year changes are based upon the rural carrier surveys, which sample 175,000 farms each June and December.

The amount of net production in each State is obtained by subtracting the weight of animals shipped in from that of animals shipped out, slaughtered locally and on farms and adding to or subtracting from the difference the change in the inventory weights during the year. The "shipped in" item is based principally upon records showing the shipments into the States such as Bureau of Animal Industry records of inspections at public stockyards of cattle, sheep and hogs; railroad records of receipts of livestock by stations; and State Sanitary Board data on inshipments. Shipments to markets or outside the States are based upon reports of the State of origin of receipts made by stockyards companies, packers, State Sanitary Boards, and railroad data. In those States where such reports are lacking or are incomplete, the shipments are estimated on the basis of sample data.

Farm slaughter is the estimated slaughter on the farm for home use and for sale of meat. These estimates are based upon data from the Census of 1929 and 1939 and yearly sample data since 1927. There were also available records of farm slaughter of hogs in 1932 and 1933 from data secured in connection with the corn-hog reduction programme of the Agricultural Adjustment Administration. Local slaughter covers retail slaughter and is based upon Census data for the years 1909 and 1929. No sample data are available for retail slaughter and the estimated number tends to be a residual in some States and varies with changes in wholesale slaughter. Changes in inventory are based upon the rural carrier surveys mentioned above. For many States check data based on assessment records, State enumerations and special surveys are available. The production of meat in terms of dressed weight of animals slaughtered is based upon records or estimates of slaughter in different channels. For inspected slaughter the dressed weight is based upon reports of packers to the Department. For non-inspected wholesale slaughter the dressed weight is based upon sample data derived from reports made to the Department of Agriculture. The dressed weight of local and farm slaughter is estimated from average live weights, which are based on sample data.

Poultry, eggs, and turkeys

POULTRY

3. Estimates of poultry relate to production of farm chickens and eggs, turkeys, and commercial broilers. No current data for non-farm chicken and egg production estimates are available. For purposes where total United States chicken and egg production is needed, 10 per cent. of the current farm estimate is used to represent non-farm production of both chickens and eggs, this figure being based upon unpublished census data for sample town holdings in 1930.

Estimated total chicken production in a given year is the sum of the farm production, plus the 10 per cent. allowance for the non-farm production, plus the commercial broilers.

The estimates of number of chickens and turkeys raised on farms are based primarily on the United States Census enumerations taken every five years. Numbers in intercensal years are estimated on the basis of indications of year-to-year change obtained primarily from the June rural carrier survey. Returns from this survey cover holdings on about 175,000 farms. Total farm production is estimated by subtracting the death loss of chickens on hand at beginning of year from the number of chickens raised.

Check data in intercensal years of an enumerative character have, with the exception of a few States where assessors' data are available, been negligible. On the other hand, the hatchery estimates covering numbers of eggs set and chicks hatched, although also made by sampling procedure, offer a good check on the total number of chickens raised. These estimates are based on an enumeration of hatchery operations taken every five years. The date of the hatchery enumeration does not correspond to the census so that this bench

mark is obtained about midway of the 5-year period between census enumerations. Year-to-year changes on hatchery production are determined from monthly reports covering about 18 per cent. of total hatchery production.

Annual estimates of commercial broiler production are based on special surveys conducted each year in all of the principal commercial producing areas of the country. Check data are not available on these estimates of commercial broiler production for the entire United States, but good local checks in the form of shipment data for important areas are used.

Supplies for annual domestic consumption are determined by adjusting the dressed weight of total slaughter for changes in cold storage stocks and net imports. Commercial broilers average about 3 pounds each and the other chickens about 4 pounds each, live-weight basis. Dressed weight (only blood and feathers off) is estimated at 88 per cent. of the live-weight.

Eggs

Estimates of the number of hens and pullets on farms each month are basic data needed to estimate egg production. These numbers are determined for January 1 from an adjusted Census base in the same manner as the figures on chickens raised. Month-to-month change in flock numbers, average rate of lay and resultant total production of eggs are based upon a sample of about 35,000 farm flocks reported monthly by crop reporters.

Absolute checks on rate of lay are not available. The results of the April, 1930 census enumerations of " eggs produced yesterday " agreed closely with monthly returns from crop reporters at the flush season of egg production. Surveys conducted by the Estension Services in some States give averages on rates of lay which usually agree with averages shown by the crop reporters. Supplies of eggs for annual domestic consumption consist of total production less hatching needs, adjusted for changes in the shell egg equivalent of storage holdings and net imports.

Turkeys

Basic data for the production of turkeys are obtained from the quinquennial census enumeration. The year-to-year change during the intervening years is determined by a special survey made in August each year and by the rural carrier surveys. There are no check data on production for the United States as a whole, but in States where enumerations of numbers raised are made each year (assessors' reports) the estimates of production of turkeys have agreed closely with the enumerations. In a number of States, a check is secured from excellent sales and inspection records.

Storage holdings of chickens, turkeys, and shell and frozen eggs are enumerated monthly by the Department of Agriculture.

The method used to estimate supplies of turkeys available for domestic consumption is identical to that for chickens except that the slaughter supply is determined only by sales from farms, plus consumption on farms—no allowance is made for non-farm production since this apparently is negligible. Live turkeys average about 16 pounds per bird and dressed weight is estimated at 91 per cent. of the live weight.

Fish

4. Statistics on fresh fish are collected in the Fish and Wildlife Division of the Department of Interior by trained statisticians who go once each year to the fishing districts to make surveys. Regular canvasses are made of all commercial fisheries of the oceans and bays and of the coastal rivers as far inland as commercial fishing is important, of the Mississippi River fisheries and all of its tributaries where commercial fishing is prosecuted, of the Great Lakes, the adjacent bays, and the international lakes of northern Minnesota.

Personal interviews take place each year with all the more important commercial fishermen and a sample number of those of lesser importance to obtain reliable information on their production. In practice virtually all

wholesale firms, all captains of fishing vessels of 5 net tons or over, and most of the important inshore fishermen are visited. Some States collect such complete statistical data on fish that the Federal agent does not need to make personal visits to the fisherman. At several important ports on the east and west coasts, agents are stationed permanently. They obtain daily figures on the quantity of all kinds of fish landed by each fishing vessel.

Production data are collected from all persons and firms engaged in the wholesale buying and selling of fishery products and from all manufacturing concerns which prepare packaged fishery products whether salted, spiced, smoked, dried, or otherwise canned or cured. Data on the production of canned fishery products or by-products are obtained at the beginning of each year on schedules from each plant in the United States engaged in this business. Where it is impossible to obtain reports by mail, personal visits are made by the Bureau's agents. Statistics on cold storage holdings are furnished monthly by the Department of Agriculture.

Foreign imports of canned fish come from compilations of Customs data made by the Bureau of Foreign and Domestic Commerce.

Fats and oils

5. Two-thirds of the lard supply is federally inspected. Of this amount, actual reports are available. Non-federally inspected lard has heretofore been a fairly constant amount, but it is difficult to get an actual count, and production is now perhaps higher than usual. Lard and butter production are reported by the Department of Agriculture. Data on margarine production are excellent since the Bureau of Internal Revenue collects an excise tax of one-fourth cent per pound and reports monthly figures.

For the other fats and oils, more or less complete data are available from the monthly report of factory production of fats and oils, published by the Bureau of the Census, and the monthly stocks and processing report for peanuts published by the Bureau of Agricultural Economics. The Bureau of the Census receives monthly schedules from all but the smallest producers of animal fats and vegetable oils, and secures reports through the Department of the Interior from renderers of marine oils. The olive oil reports are perhaps the least complete of the oil group. The reported production of edible tallow is nearly complete since most of it is federally inspected. The monthly Census reports also include imports of oils (available but not published at present). The source of foreign trade data is Customs records.

The Department of Agriculture also makes monthly forecasts during the growing season of the probable total production of the vegetable oil crops produced in the United States. These forecasts are based upon data collected from producers of the various crops and provide a basis for pre-harvest approximations of the amount of oils which will likely be available from the harvests of such crops.

Stocks of oils are reported monthly in factories and warehouses by Census, but nothing is available on wholesale or retail stocks. This tends to make disappearance figures disproportionately large when wholesalers or retailers are building up stocks, as in 1941. The Department of Agriculture collects information on butter and lard in storage.

Sugar

6. Domestic production figures in the United States are compiled on beet sugar every month by reports direct from the twenty-odd producers in the industry and on cane sugar by reports secured monthly through representatives in Louisiana and Florida who go to the producers on the scene. Sugar beet factories also submit annual reports to field offices of the Division of Agricultural Statistics upon which are based production statistics by States.

United States sugar imports, in pre-war years based on quotas set up by the Federal Sugar Agency, now are limited only by shipping since quotas were suspended early in 1942. Import data come direct from the companies importing to the Department of Agriculture. Refiners in the United States wire weekly their raw sugar receipts. These are checked by the Customs forms on all sugar imports which are mailed to the Department on arrival of shipments at the ports. Customs receipts are also received on all refined sugar coming into the country. Checks on the import data are provided by the official Customs figures published by the Department of Commerce at the close of each month.

Disappearance figures are available through the Office of Price Administration which rations sugar. Stock data are reported by the refiners.

Honey

7. Quantitative estimates of honey production were begun in 1941. Information was assembled from every available source, including the United States census enumerations; State licence, inspection and survey records; leading honey producers and handlers, etc. From these data, basic figures on numbers of colonies and production of honey were established for the year 1939. From that base year, estimates were projected forward and backward on the basis of the data assembled, including reports received from honey producers annually since 1914 showing numbers of colonies on hand and amount of honey produced in their own apiaries. The number of these reports has varied through the years, ranging from a few thousand in some years up to as high as ten thousand in recent years. The data are very good for many of the more important surplus honey producing States such as California, Michigan, Pennsylvania, New York and Florida. They are in general good for the surplus honey areas of the North and West. Aside from the reports received from the producers, data are relatively scanty for most of the Southern States and for other States of light production.

No absolute quantitative check is available to determine the accuracy of the basic figures for the United States. The per cent. of possible error in the present year-to-year changes is felt to be quite small in view of the size of the sample returns which in 1942 covered about 22 per cent. of the United States' total production of surplus honey, i.e., honey removed from the hive.

Vegetables

Fresh

8. Production figures of fresh vegetables for commercial use are secured in two principal ways. (1) Statisticians from State field offices travel through producing areas, making personal observations and interviewing "key" men who are in a position to be well acquainted with conditions in their localities. These "key" men are primarily well informed growers and shippers who depend on vegetable growing for a livelihood and are, therefore, greatly interested in having reliable data covering the industry throughout the country. Other "key" men include local bankers who help finance growing operations, managers of local co-operatives or shipping associations, country agents, Department of Agriculture market news reporters, railroad station and agricultural agents, and State marketing officials. From interviews with these men, the representatives collect information on acreage when plantings are made, on the progress of the crop during the growing season, and on yield per acre and production at the time of harvest of the crop in each area. (2) Some 10,000 schedules are mailed each month during the growing season to correspondents who report progress of their own crops, harvested acreages, and yields per acre. These correspondents also give their opinions of conditions in their entire localities. The figures obtained from these two sources are built up into national totals and checked in various ways: through carlot rail shipment data; through truck unloads in thirteen large cities; through

assessors' figures in some States ; and in some cases through fertiliser and seed sales. A few States including Florida and California—two important vegetable-growing areas—record the contents of all trucks leaving their borders.

Commercial production is defined more or less loosely as crops grown for shipment over a distance. A few important growing areas are found close to large cities which absorb much of the crop, but these are included in commercial production because at least some of the produce is shipped over a wider area. For the most part, however, commercial truck crops are grown in areas which are rather widely separated from their markets. The commercial production of fresh vegetables may be about one-half the entire fresh vegetable supply of the country, the remainder comprising production in market gardens, farm gardens and Victory gardens.

CANNED

Data on production of vegetables for processing are very reliable. All of the 2,300 commercial canners are circularized in the spring after they have made contracts with growers for their crops. About 90 per cent. of the vegetables commercially processed is contracted for in advance. From the canners' data, estimates of total production for processing are prepared. Through the season, reports on the progress of crops are made by the canners, and after the harvest, final reports are received on total tonnage canned, including that bought on the open market. The eleven crops reported on by the Department of Agriculture include at least 95 per cent. of the total canned vegetables pack. This careful enumeration is checked with figures from the National Canners' Association who keep an independent record on the pack of all United States canning crops.

Fruits

FRESH

9. United States fruit production estimates are the summation of separate estimates for each of the 48 States. The State totals include total production on farms for all counties within each State. An exception is apples—for which the estimates are limited by Statute to the commercial crop. Also, estimates for a few fruits are not made for some States having a very small production. This incompleteness is small and of little importance in relation to the United States total.

Many sources are utilised in preparing the fruit production estimates. During the growing season indications of the size of the current year's crop in relation to the previous season and in relation to normal are obtained by sending mail schedules about the first of each month to a well-distributed list of informed farmers and country dealers. These sample data are supplemented by information obtained by the crop statistician in each State through personal contact with informed individuals and actual observation of the prospective crop in the orchards. Records of shipments by railroads and trucking concerns, quantities inspected by State or Federal inspection services, reports of processors on quantities canned, dried, manufactured into wine, juice, and cider, are extensively utilised checks on production and utilisation of fruit crops. Comprehensive mail surveys of crop utilisation at the season's end give other valuable indications of production and utilisation.

Special enumerations and mail surveys are made when large changes in production and bearing capacity are taking place or when production estimates for small local areas are needed. At 5-year intervals the United States Census enumeration gives a relatively complete coverage of number of trees and vines and production for one year out of five.

CANNED

Statistics on processed fruits are obtained principally from the National Canners' Association which makes annual enumerations of the packs. Records of the National Canners' Association are reasonably dependable although they

may be slightly on the minimum side. During the war-time emergency additional checks on packs of canned fruits have been obtained by the Office of Price Administration and by the War Production Board in connection with programmes on rationing of canned goods and tin plate allocations. Records of dried fruit production are obtained mostly from the Dried Fruit Association of California. Production in other States, which is a negligible part of the total, are mostly estimates. Some of the field offices of the Division of Agricultural Statistics, make fairly complete enumerations of fruit processing in particular States at the end of the marketing season.

Beans and peas

10. Production of dry beans and peas is derived from annual estimates of harvested acreages and yield per acre. These estimates are based primarily on mailed inquiries returned by the voluntary reporters of the Crop Reporting Board and the returns from 200,000 farmers reporting on the rural carrier surveys which give indications of year-to-year acreage changes and yield per acre. Quinquennial enumerations by the Bureau of the Census furnish basic data on levels of production. The annual estimates are substantiated in some States by data from annual enumerations of assessors and in others by check data such as inspections, warehouse, and cleaners' and dealers' report. Michigan, where 30 per cent. of the beans are produced, requires State inspection of all beans sold ; these reports are a good indication of the size of the crop. California and Idaho, two other important producing States, have warehouse reports which provide a reliable check on the crop. In New Mexico and Nebraska, all bean cleaners and dealers report direct to the Department of Agriculture on totals handled.

Quarterly reports are prepared by the Department on stocks on farms and in commercial storage in producing areas. Farm stocks are based on a sample of reports from individual growers. Stocks in commercial storage represent complete enumerations in some States and in others are estimations based on very large sample returns from commercial storage concerns. Little or no data are available on stocks in retail channels or in non-producing States.

Annual reports on farm disposition, i.e., amounts used in the farm household, quantities used for seed and for feed and quantities sold, are made annually. Non-farm production of dry beans and peas is not included in total production but is believed to be relatively unimportant.

Grains

11. Production of the various grains is derived from estimates of acreage and yield per acre. The level of acreage estimates is based on the agricultural census taken every five years by the Bureau of the Census.

In intercensal years, the indications of acreage change are obtained each year from approximately 200,000 individual farmers through the co-operation of rural mail carriers. These are supplemented in each State by returns to mailed inquiries and other indications of acreage or production such as annual State assessors' enumerations, crop meter frontage measurements, carlot shipments, elevator and warehouse receipts and other crop checks.

Yields per acre in census years are largely determined from the census enumeration of acreage and production of individual crops. In intercensal years, estimated yields per acre are based on reports from farmers on the average yield per acre in their localities and on reports of acreage and production of principal crops on individual farms. During the growing season, yields are forecast from reported condition of the crop. Estimates of farm disposition are based upon sample data. Farm disposition covers such items as quantities used for seed, fed to livestock, used for food in the farm household and sales. Monthly sales by farmers are based upon returns from farmers, reports from primary handlers and upon check data, such as railroad shipments and reports of processors.

Data on grain stocks are collected from several sources. Farm stocks of wheat, corn and oats are estimated quarterly from individual farm reports of production and grains on hand. Farm stocks of barley and rye are estimates semi-annually, based on like sample data. Stocks in interior mills, elevators and warehouses come from sample data from these firms. Merchant mill stocks of wheat are enumerated quarterly by the Bureau of the Census. Commercial stocks of wheat, corn, oats, barley, rye and flax at the important terminal markets are reported weekly to the Department of Agriculture.

Data on the commercial utilisation of grains are obtained from millers and processors. Reports on wheat-flour grindings are received monthly by the Bureau of the Census from mills accounting for about 94 per cent. of the total wheat flour production. The quantities of each of the grains used for breakfast foods also are estimated by the Department of Agriculture on the basis of biennial Census returns. The same is true of rye millings and the quantity of corn used in the dry-process industry. The quantity of corn used in the wet-process industry (including production of syrup, sugar and starch) is as reported by the industry to the Corn Refiners' Statistical Bureau, a private agency.

The total wheat used for food within the United States is the equivalent of the flour and breakfast foods produced less exports. The total corn used for food is made up of that used in the dry-process production plus corn used in the wet-process industry for syrup, sugar, and starch used for food, plus breakfast foods. Oats for food is confined to breakfast foods.

Quantities of each of the grains used for the production of alcoholic products are reported to the Bureau of Internal Revenue, Department of the Treasury. The quantities of each of the grains used for total feed is determined as a residual after the deduction of all other items of disposition.

Rice

12. Rice is a commodity for which practically complete check data on a year's crop become available by the time a new crop is ready for harvest.

Production of rough rice is forecast currently during the growing season from estimates of acreage and yield. Estimates of acreage are based on sample indications from individual farm acreage surveys made in March and June and from the rural carrier surveys. From July through the growing season, yield per harvested acre is estimated from reports on progress of the crop secured from special lists of rice growers who report voluntarily on schedules distributed from the State offices. The annual estimates of acreage, yield, and production are carefully checked against reports on acres measured under the agricultural conservation programme, enumerations of acreage and estimates of production prepared by associations of rice growers and rice millers and by other trade sources. Also at the end of each marketing season a complete enumeration of mill receipts is made which when combined with estimated amounts used for seed and for food and feed on farms where grown gives a complete check or balance sheet on the crop for each State.

Stocks of rough rice are obtained as of January 1, April 1, and August 1 each year. Estimates of farm stocks are based on sample indications from growers. Stocks in mills and warehouses are enumerated by the State statisticians in each producing State.

On milled rice, the Department of Agriculture collects monthly statistics from individual mills and from rice organisations on the quantity of rough rice received by them, the quantity milled, milled rice produced, rice shipped, and stocks on hand. The mills report to the field office in California ; in the South the rice millers' association reports for all member mills and those who are not members of the association report directly to the Department. All commercial mills, of which there are only about 75, are included.

Small huller mills operating in one State, Louisiana, are reported annually, since their total production is small and primarily for home use.

Coffee, tea, cocoa

13. Coffee, tea, and cocoa figures are available from two sources, both of which are complete enumeration. In war-time these imports come into the country under a General Imports Order of the War Production Board. Each shipment has to have a Customs Transaction Certificate before it is shipped into the country. From these certificates, current figures are compiled of all imports of these three items. One set of certificates is compiled into totals in the Department of Agriculture ; these can be checked against the totals built up from the same sources in the War Production Board. About a month after importation the Department of Commerce issues import figures from the Customs data. These provide an excellent check on the earlier enumeration.

From July, 1942, to August, 1943, all coffee entering the United States was bought by the Commodity Credit Corporation from which government agency auditing data on imports could also be obtained. Now coffee imports are again in the hands of private industry, but still under the general licensing arrangement described above.

These imports are under a quota agreement and also a shipping priority arrangement so that estimates of future supply are based on these agreements and on the general shipping picture as it can be foreseen in advance.

Stocks are reported by the dealers to the Department of Agriculture.

B. Imports

Department of Commerce reports were used for all years up to July 1, 1943. For the period July 1, 1943 to June 30, 1944, estimates prepared by supply estimates committees of the Food Distribution Administration were used.

C. Stocks

Reports of the Bureau of Agricultural Economics were used through 1942. Commercial stocks on January 1, 1943, were in most cases also obtained from the Bureau of Agricultural Economics, while government stocks were obtained from the Transportation and Warehousing Branch of the Food Distribution Administration. For most commodities, stocks on July 1, 1943, January 1, 1944, and July 1, 1944, were estimated by supply estimates committees of the Food Distribution Administration.

D. Non-Food Disposal and Duplication

Except in the case of sugar Bureau of Agricultural Economics data regarding feed, seed and industrial use were used for all years except the fiscal year 1943-44. For the fiscal year 1943-44, estimates prepared by the supply estimates committees were used. For sugar, Census data were used for 1935-39, and Office of Price Administration estimates for 1943 and 1943-44. Footnotes to the tables usually indicate when duplication, such as sugar already accounted for elsewhere, was taken account of in this section.

E. Non-Civilian Food Disposal

Food use by the Military and War Services for 1942 and 1943 was estimated by the Food Distribution Administration, using partial reports furnished by the services. In the case of sugar, refiners' reports of deliveries were used for 1942 and allocations for 1943. Estimates of military food utilisation for 1943-44 were based upon the quantities allocated to them by the War Food Administrator.

Lend/Lease data for 1942 were obtained from the Lend/Lease delivery report prepared by the Transportation and Warehousing Branch. The United Kingdom figures for 1942 include exports to British Colonies and British Services Overseas paid for by Lend/Lease. Lend/Lease data for 1943 and 1943-44 were obtained from delivery reports for the first nine months of the calendar

year 1943 and estimated from the allocations for the remaining months. The United Kingdom figures for 1943 and 1943-44 include shipments to British Services Overseas paid for by Lend/Lease.

For 1935-39 estimates of " other exports and shipments " are based on the export and shipment figures reported by the Department of Commerce. " Other exports and shipments " for 1942 were obtained by deducting the quantity shipped under Lend/Lease, as shown on the delivery reports, from total exports as reported by the Department of Commerce. To this result was added both commercial and FDA shipments to United States Territories. Estimates based upon Commerce data were used also for the first six months of 1943. For the year beginning July 1, 1943, reports estimates were based on export allocations of the War Food Administration.

F. Total Civilian Disposition of Food

This figure was in most cases the residual after Sections C, D, and E had been subtracted from total production plus imports. Civilian grain consumption, however, was estimated independently by the Bureau of Agricultural Economics leaving feed uses of grain as the residual. Beyond July 1, 1943 the civilian consumption estimate is based essentially on allocations of the War Food Administrator, which in turn depend on supply forecasts and on allocations for non-civilian uses.

APPENDIX I
SECTION B

STATISTICAL METHODS EMPLOYED IN CANADA

For the most part Canadian statistics of food supplies moving into consumption are derived from production statistics estimated by the Agricultural Branch of the Dominion Bureau of Statistics and adjusted for stock changes, imports, exports, non-food uses, feed, seed, waste and non-civilian use including the armed forces, Red Cross boxes and ships' stores. Where possible available data on marketings were used as a check on production statistics and in the case of foods which were processed such as refined sugar and flour the output of the manufacturers was used in place of primary production data. The final adjusted figure of civilian consumption was divided by the civilian population after total population had been adjusted for numbers serving in the armed forces outside Canada and those living in barracks in Canada.

The basis of all production statistics other than manufactured or processed products is the Agricultural Census, taken every ten years (latest 1941) in all provinces and every five years in the Prairie Provinces of Manitoba, Saskatchewan and Alberta. On the base established from the general census the intercensal years are estimated on the basis of semi-annual surveys mailed to all farmers and from which a sample of close to 20 per cent. is received. These semi-annual surveys apply chiefly to crop acreages and livestock numbers. Crop yields are estimated by means of returns secured from a corps of crop correspondents reporting periodically throughout the year. Special lists of correspondents supply data on particular topics such as dairy, poultry, fruits and vegetables, honey and maple products.

Records of grain marketings are available for the Prairie Provinces and livestock marketing statistics are collected and published by the Dominion Department of Agriculture.

Dairy Products

The data on the production and utilisation of dairy products are obtained in two ways. First, from actual figures reported by processing establishments and second, estimates made on the basis of sample returns, census figures or a combination of both.

Butter, cheese, and concentrated milk products are reported monthly to the Dominion Bureau of Statistics. The latter statement is usually not published until all figures are complete as the number of firms are few. Butter and cheese production data frequently contain estimates for outstanding firms when first published. These estimates are made on comparing the figures reported by those firms reporting both last year and this year. At the end of the year the returns are practically complete and are revised accordingly. These are revised a third time on the basis of the annual statistics reported to the Census of Industry and the differences in the yearly figures are pro rated on a monthly basis so that the monthly figures add up to the total.

Ice cream production is now being reported monthly and is sent in by wire on the sixth of the month, the same as butter and cheese, the original compilation being made by the provincial authorities. Different from butter and cheese, these data are partial estimates, the returns being obtained only from firms engaged in the production of ice cream mix or those manufacturing both ice cream and ice cream mix. There are countless numbers of counter-freezers making ice cream. Most of these establishments purchase mix from the producers so that it is not necessary to record their make. From the figures covering the production of mix (sold as such) the purchases of mix are deducted. This net figure is designed to cover counter-freezers, bakeries, confectioneries and those using ice cream in the bread-biscuit industry. Mix not sold is reported in the form of ice cream.

In making up monthly estimates of milk production and utilisation, the above figures covering creamery butter, cheddar cheese, concentrated milk products and ice cream are taken as indicated and converted to a milk basis. The annual estimate of farm-made cheese, based on the census and adjusted annually in the light of information secured from dairy correspondents, is distributed equally between the 12 months and in making up the current figures the estimate for the previous year is usually taken without attempting any adjustments.

Estimates of fluid sales are based on the annual estimates of the previous year and adjusted in accordance with returns from cities and the larger towns, together with the figures sent in from a scattered sample of smaller towns and villages. Setting the percentage increase or decrease weight is given to these returns in accordance with the population represented.

Milk consumed in farm homes is based on the census and adjusted in the same way as fluid sales but on the basis of returns received from dairy correspondents. There are approximately two thousand of these correspondents scattered throughout Canada and the reports are usually paired with statements received from the same informants for the same month of the previous year.

NOTE : The preceding paragraph refers entirely to monthly estimates ; also observe that the annual estimates form the basis for adjustments in connection with milk otherwise used (fluid sales, milk consumed in farm homes and milk fed to calves). In making up the annual estimates we commence first of all with the known products. These include creamery butter, cheddar cheese, concentrated milk products, ice cream, dairy butter (placed closely in line with the census figures and adjusted from year to year by the returns from dairy correspondents), and finally, farm-made cheese, also based on the census with a few minor adjustments made in consultation with the Dairy Commissioners in the provinces. To these known products we add fed on farms which it is believed can be estimated more accurately on the basis of the calf population as at June 1, multiplied by 350 pounds than by the use of the census figures as given. The total quantity of milk used in these products in the census year is taken as the basis and it is assumed that the remainder of the milk is either used in fluid sales or for farm-home consumed.

Adjustments were made in the intercensal years (1930 to 1940) by increasing or decreasing the milk used for rural or urban consumption in the same proportion as the known products had advanced in the corresponding period. With the advent of the war, however and the increased consumption of fluid milk, this plan has not been strictly adhered to and at the commencement of 1941 greater consideration was given to the changes in fluid milk consumption as shown in returns received from those engaged in milk distribution in the towns and cities mentioned above. More use is also made of the returns from dairy correspondents particularly as a check on the method of adjustments based on the increase or decrease of quantities of milk used for known purposes. All of these estimates are finally referred to the Dairy Commissioners in the provinces and any figures they publish are in line with those released by the Bureau. Trade statistics on dairy products are available in detail from the External Trade Branch of the Bureau, based on Customs returns. Stocks of all important dairy products are collected monthly by the Agricultural Branch. Commencing December, 1942, a consumer subsidy of 2 cents per quart has been paid on all milk sold at retail. This will provide a check on the estimates of fluid sales of milk.

Meats

Beef

Statistics of beef supplies may be divided into two categories :

(*a*) *Inspected slaughter.*—Firm statistics are available on the numbers and total dressed weight of cattle slaughtered in inspected slaughter houses.

(*b*) *Uninspected slaughter.*—Estimates are made of the numbers of cattle slaughtered on farms for home use and for sale and slaughtered by local butchers and at other uninspected plants.

The estimates of uninspected slaughter are primarily based on statistics of receipts of country hides at tanneries. The statistics on receipts of packer hides check closely with the inspected slaughter figures indicating a fair degree of reliability in the hide figures. Data collected in the semi-annual surveys of the Agricultural Branch on farm slaughter and sales off farms provide a check on the original estimates. Census data are also available to check against the annual estimates. Numbers of cattle slaughtered outside inspected slaughtering plants range from 40 to 45 per cent. of the total slaughter.

Veal

Estimates of total supplies of veal are made in a manner very similar to those of beef. Firm statistics are available on the inspected slaughter. The farm and other uninspected kill is estimated on a basis similar to that of beef.

Pork

As in the case of cattle and calves it has been necessary to estimate the uninspected slaughter of hogs. Data collected in the semi-annual surveys of the Agricultural Branch of the Dominion Bureau of Statistics provide the basis for this estimate. It is estimated that approximately 25 per cent. of the total slaughter of hogs in 1943 was killed in farms or by local butchers. Weights reported by packers on the kill in inspected plants are warm dressed. These have been corrected as follows :

1. Warm weight to cold weight, 3 per cent. shrunk.
2. Kidney and tongue weight in carcase, 1½ pounds per head.
3. Killing and cutting fats, head bones etc., 14 per cent.

In 1943 the average warm dressed weight of hog carcases up to the end of October was reported at 169 pounds. The net weight of wholesale meat was estimated at 139.5 pounds. The warm dressed weight of uninspected slaughter was estimated at 134 pounds per head.

Mutton and Lamb

The estimated uninspected slaughter of sheep and lambs was based on data collected on the semi-annual June and December surveys of sales off farms and farm slaughter of sheep and lambs.

Poultry, Fish and Game

Poultry

Estimates of the amounts of poultry meat, hens and chickens, turkeys, ducks and geese, are made annually and are based primarily on information collected in the decennial census adjusted from year to year according to changes in numbers of poultry on farms as indicated by the June 1 and December 1 surveys. Additional supplementary information is collected monthly from poultry correspondents. Information now available for the 1941 census has been used as a basis for current estimates and for revision, when necessary, of the annual estimates previously made over the period 1930 to 1940.

Fish

Statistics are collected by the Animal Products and Fisheries Branch of the Dominion Bureau of Statistics on the landed weight and marketings of commercial fisheries both at coastal and inland points. These statistics are prepared in considerable detail and in co-operation with the Department of Fisheries have been analysed and reduced to a fillet basis. The coverage is complete with the obvious exception of fish caught by small operators or part-time fishermen. Statistics are also available on the fish canning industry and estimates of net supplies of this product are provided on an annual basis.

Game

Game is of relatively minor importance in the Canadian diet and very little statistical information is available on the quantities of game killed and consumed. The Dominion Department of Natural Resources have some records of big game killed by licensed hunters, and have provided an overall estimate on the dressed weight of meat consumed. No detailed statistics are available to provide for estimating the year to year changes in supplies.

Eggs

For a number of years poultry statistics have been based primarily on the census with year to year changes based on the semi-annual surveys. These estimates are checked with officials of the Marketing Service of the Federal Department of Agriculture and the provincial statisticians and provincial or Dominion poultrymen located in the provinces. The same policy is still being pursued but foundation data is now being recorded from the reports received from special poultry correspondents. The number of eggs per hen and the total production of eggs are estimated after consultation with the provincial officials. Numbers of laying birds are based on the census with year-to-year changes estimated from the semi-annual surveys. The percentages actually used are checked through consultations with the men in the field. Statistics now available in the Department of Agriculture on hatchery operations provide a further check on poultry operations. Estimates of production of poultry meat, including turkeys, ducks and geese, are based on census data and on the semi-annual surveys.

Fats and Oils

Butter production must be considered under two headings (*a*) creamery and (*b*) farm-made or dairy butter. Statistics on the production of creamery butter are collected monthly from the creameries and after final checking at the end of the year can be considered as accurate and reliable. The production of farm-made butter representing from 20 to 25 per cent. of the total is an estimate. The census provides the original base for the estimate and annual adjustments are made on the basis of returns from dairy correspondents.

The annual estimate of domestic lard production is a by-product of the estimates of pork production. After the estimate has been made of the net slaughter of hogs in Canada the average yield of rendered lard as reported by the inspected plants is applied to the estimate of total numbers slaughtered and a total yield of lard is calculated.

Annual figures of the production of domestic shortening and lard compounds are provided in the census of industry covering the plants manufacturing these products. Other edible oils are, for the most part, imported into Canada and import statistics form the basis for calculations of consumption. In war-time it has been possible to secure reliable data on fats and oils from the office of the Oils and Fats Administrator War-time Prices and Trade Board.

Sugars and Syrups

Statistics of consumption of refined sugar are available from the reports of the sugar-refining industry, trade statistics and stock figures. These statistics are among the most complete now available. Annual estimates of maple syrup and sugar production are made in the Agricultural Branch of the Dominion Bureau of Statistics based on census returns and an annual sample survey of producers. These estimates are checked with provincial authorities and appear to be reasonably accurate. Trade statistics are available on the movement of this product. Statistics on the production of corn syrup, molasses and other syrups are available annually from the census of industry reports. The commercial production of jams, jellies and marmalade is recorded annually in the industrial census but no data is available on the home canning. In regard to home canning, however, the consumption estimates of fruits and sugar include amounts used in this manner.

Potatoes

Annual estimates are made of the production of potatoes based on acreage and yields per acre. Deductions are made from the production estimates to cover seed, feed, wastage in grading and storage and industrial use. These estimated deductions have proven difficult to calculate with a high degree of accuracy. Industrial utilisation is a known figure, but wastage and livestock feeding may vary widely from year to year depending on the size of the crop, weather conditions at harvest time and the state of the market. More detailed information will be necessary before completely dependable statistics on potato consumption can be secured.

Dry Beans, Peas, Soybeans, Nuts

The production of peas and beans is estimated annually by the Agricultural Branch but additional data on loss in grading and farm feeding present problems and a completely satisfactory estimate cannot be made of the amount going into human consumption. Records of the canning industry provide information on the amount of beans processed but additional amounts must be added for home-consumed beans.

Soybean production is comparatively new in Canada and statistics of production are available only for a relatively short period. Soybeans used in the production of prepared foods are recorded in the industrial census. Soybeans are not yet used extensively as a human food in Canada.

Peanut butter, shelled peanuts and tree nuts are all imported into Canada and trade statistics together with records of the industrial census provide reasonably reliable statistics of human consumption of these products.

Tomatoes and Citrus Fruits

The production of tomatoes by commercial growers has been estimated annually by the Agricultural Branch in co-operation with the Dominion and Provincial Departments of Agriculture. Information is also available from the 1941 census. Records of the canning industry provide data on that

portion of the crop which is processed. Until 1943 no information was available on the production and consumption of tomatoes by growers producing small amounts for their own use or local markets. A discussion of methods of estimating non-commercial production of vegetables, including tomatoes, is presented at the end of this section.

As citrus fruits are all imported into Canada the trade statistics provide a reasonably accurate basis for estimating human consumption. Allowance has to be made for the wastage which occurs between the time of importation and final consumption. Canned fruits and juices have been tabulated from import statistics combined with records of domestic manufacture from the Industrial Census.

Other Fruits

Domestic fruit production is estimated only on the basis of commercial production and does not include the production in backyard gardens and on general farms. Apples represent the largest item in this group but lesser amounts of peaches pears apricots, berries and other fruits are included. The Census coupled with annual surveys and co-operation with Provincial and Dominion Department of Agriculture officers provide the basis for these estimates.

Vegetables

As in the case of fruit, the estimates of production of vegetables normally apply only to that part of the crop which is produced by commercial growers, but special methods were developed in 1943 in an attempt to secure a more complete coverage. The census and annual surveys provide the basis of these estimates.

Grains

Annual estimates of grain production are based on acreages derived from the census and annual surveys and yields per acre secured from crop correspondents. These are checked and revised on the basis of marketing statistics. Estimates of human consumption of cereal products have been secured, however by using the statistics of the milling industry which are published monthly by the Agricultural Branch. From the Industrial Census statistics are also available on grain and grain products used in the breakfast food, baking and allied industries. These statistics, together with trade data and those of stocks, provide a sound basis for estimating human consumption.

Tea, Coffee and Cocoa

All these products are imported into Canada and estimates of human consumption are based mainly on the trade figures. During war-time it has been possible to secure even more reliable data from the Food Administration on the disposition of these products.

Non-Commercial Vegetables including Tomatoes

To arrive at an estimate of non-commercial production of vegetables the first step was to obtain from the Census Branch a breakdown of the numbers of households into rural and urban areas. The households in urban centres were further divided into those situated in cities over 30,000 population and those located in cities of 30,000 population and under. The rural households were divided into farm households and non-farm rural households. Estimates of the number of households with gardens in these four classes were made as follows : cities over 30,000 population, 5 per cent. ; cities 30,000 population and under, 10 per cent. ; rural non-farm households, 40 per cent. ; farm households, 70 per cent. These percentages gave a total of 105,000 households with gardens in urban areas and 700,000 households with gardens in rural areas. Estimates of production of individual vegetables in the average rural and urban garden were made, and these quantities were used in conjunction with the estimates of the number of gardens to arrive at a total for Canada.

STATISTICAL METHODS EMPLOYED IN THE UNITED KINGDOM

Fairly precise measurements are possible of the supplies of most foodstuffs moving into consumption in the United Kingdom particularly during the war years when nearly all important commodities have come under the direct control of the Ministry of Food. Even before the war, however, the greater part of the food supply could be measured with substantial accuracy. For example, an unusually large proportion of the food consumed was imported ; records of imports and re-exports are available and estimates derived from them of the quantities retained for consumption inside the United Kingdom may be regarded as reliable when averaged over a number of years, which minimizes any inaccuracy due to changes in stocks. For some dutiable commodities, e.g., sugar and tea, where the main stocks were held in bond, records of stock changes are also available.

The estimation of pre-war supplies of home produced foods presents greater difficulty, but even here a considerable body of statistical data can be drawn on. The records of Marketing Boards set up for a number of home agricultural products before the war provide accurate data covering 80—90 per cent. of the estimated human consumption home produced of milk, milk products and bacon, and yield valuable information on the consumption of potatoes. Statistics are available covering landings of sea-fish at all but the smallest fishing ports. Finally comprehensive agricultural censuses were taken each June of the acreage under crops and the livestock population on all agricultural holdings of one acre or more ; this was supplemented by a voluntary but widely answered census in December. This information coupled with a well-developed crop reporting service enabled good estimates to be made of home agricultural production.

Another source of statistical data for the pre-war period relates to an important group of processed foods, notably flour, margarine and compound lard, for which regular returns of production were made to such official bodies as the Food Defence Plans Department, the Wheat Commission and the Imperial Economic Committee. Similar information covering other food processing trades was available from the Board of Trade's five yearly Census of Production, and this has been supplemented since the war by returns by manufacturers covering pre-war datum periods.

To sum up, it may be said that foods for which fairly precise statistical records were available before the war represented about 85 per cent. of total supply measured in terms of calories. For the remaining 15 per cent., of which the most important items are home produced meat, eggs, fruit, and vegetables, the estimates are derived from statistics of acreages, livestock numbers and yields.

The development of war-time controls covering practically all imported and a large proportion of home produced foodstuffs has enabled still closer estimates to be built up of supplies moving into civilian consumption during the war years. Controls were first imposed on a number of important foods in 1939 and were gradually extended in 1940 and 1941. From 1942 onwards, supplies of most foodstuffs can be measured with a considerable degree of accuracy on what is virtually an accounting basis.

The only items into which rougher methods of estimation still enter to any significant extent comprise fruit and vegetables, and foods produced by self-suppliers. For these foods the consumer survey, operated by the Ministry of Food, enables a rough statistical check to be made on the results obtained by other methods and the figures presented may be regarded as substantially correct. Any error would not, however, greatly effect the total picture, except for supplies of vitamins A and C which derive largely from vegetables.

Taking the current United Kingdom supply figures as a whole, it may be said that they are probably more reliable than any similar figures which have previously been available in any country.

In reducing total to *per capita* supplies no attempt has been made to distinguish between civilian and services consumption for the pre-war period. The numbers of men in the armed forces was at that time too small significantly to affect the average and no records are available of their consumption. For this period therefore total supples have been divided by the total population, including members of the Services.

For the war years food going to the Armed Forces has been deducted, and the remaining civilian supply divided by the total population fed from it, that is to say by the civilian population together with members of the armed forces on leave or billeted on civilians and therefore drawing on civilian supplies. A continuous measurement of the civilian population is possible during the war years from the numbers of civilian registration cards or civilian ration books,

The statistical methods adopted for individual commodities are briefly summarised below for reference :

Fluid Milk

The estimates are based primarily on (*a*) accounting records of sales by Milk Marketing Boards which cover 80 per cent. of the estimated human consumption of home produced milk and milk products in the pre-war period rising to over 90 per cent. in 1943 (these records distinguish between milk for liquid consumption and milk for condensed milk, cheese and other manufactured products) and (*b*) estimates of total milk production, derived from a complete census of dairy cows (taken annually before the war and quarterly during the war period) and on Ministry of Agriculture estimates of average milk yields based on periodic surveys.

Sales by Marketing Boards are regarded as the basic data. The quantity by which the estimated total production exceeds sales by Marketing Boards is broken down into milk used for livestock, for farmhouse butter and cheese and for liquid consumption on the basis of pre-war agricultural production census, re-interpreted to allow for war-time conditions. The small residual figure represents " self-suppliers," covering consumption on farms and sales in remote areas outside the marketing schemes.

An allowance of 1 per cent. has been made on all milk consumption figures to allow for wastage.

Cream

The small quantities produced before the war and in 1940 are estimated from Milk Marketing Board records and pre-war censuses of Agricultural production. The separation of cream (except for butter) was prohibited after 1940.

Ice Cream

No data are available on the quantities of milk and cream made into ice cream. Any quantities used for this purpose are therefore included in the figures for fluid milk and cream. Production was always relatively small compared with the United States and Canada and was discontinued after 1942.

Condensed and Evaporated Milk : Dried Milk

Pre-war home production estimates are based on Milk Marketing Board records. Imported supplies are derived entirely from import statistics. Since the war these commodities have come under Ministry of Food control and the estimates are built up from Ministry records of arrivals, home production, stocks and deliveries, adjusted for changes in distributors stocks.

Cheese

Three-quarters of the pre-war supply was imported and the estimates are based on record of imports. By far the greater part of the home produced cheese (including most farmhouse cheese) is covered by Milk Marketing Board

records. The small farmhouse production outside the Marketing Board's schemes is estimated from pre-war agricultural production censuses.

Both imported and home produced cheese now come under Ministry of Food control and are covered on an accounting basis.

Carcase Meat and Offals

Rather more than half the pre-war supply is covered by import and export statistics. The estimates of home produced supplies before the war are derived from detailed annual census figures of livestock numbers and slaughterhouse records of average weights: the pre-war figures have been revised on the basis of war-time experience.

Since the war all home produced as well as imported meat has been brought under Ministry of Food control and is covered on an accounting basis. To ensure adequate control of home produced supplies, the number of slaughterhouses in Great Britain has been reduced from about 16,000 before the war to about 700, all under Ministry supervision. The estimates of production by self-suppliers are explained in the paragraph on bacon.

Bacon and Ham

About 70 per cent. of the pre-war supply is covered by import and export statistics and about 28 per cent. by the records of the Bacon Marketing Board. The small remaining part is estimated from Agricultural Production census returns. During the war period, all imported and all commercial supplies of home produced bacon are controlled by the Ministry of Food and are covered on an accounting basis.

There has been a considerable growth since the war in the number of animals kept for their own use by private individuals and pig-clubs. Such animals may only be slaughtered under licence and the number of licences issued provides a means of estimating the non-commercial supply; in 1942 it was estimated at 26 thousand tons (including 22 thousand tons of bacon) or 1.4 per cent. of the total supply of meat and bacon. Clearly there is likely to be some illicit slaughter, but in view of the strict rationing of feeding stuffs and the close control of meat distribution it is considered that the total quantity going illegally to private consumption or to the black market is small.

Canned Meat

Only imported canned meat is covered in the estimates, any home produced meat canned being included with carcase meat. The pre-war figures are based on import and export statistics, and the war-time figures on the records of the Ministry of Food which now controls all canned meat.

Poultry

The estimates are derived from census returns of numbers of poultry adjusted to allow for production by self-suppliers. In view of the rapid turnover of the poultry population such estimates are inherently liable to a wide margin of error, but the figures are in substantial agreement with the results of consumer surveys.

Rabbits and Game

Only very approximate estimates can be made, based in the case of rabbits on such data as the numbers of skins sold to furriers, but the results are in substantial agreement with consumer survey results.

Fresh, Frozen and Cured Fish

Pre-war figures are based on import and export statistics and on the Fisheries Departments records of British landings, supplemented by the records of the Herring Marketing Board. Pre-war consumption of sea fish may be slightly over-stated in the absence of records of the quantities of whole fish used for the production of fishmeal. The small supply of fresh water fish is not covered. Distribution of fish is now controlled by the Ministry of Food and this provides additional information for the war period, All *per capita* figures are expressed as fillet (edible) weights.

Canned Fish

For the pre-war period import and export figures cover 91.6 per cent. of supplies. The small estimate for home produced canned fish is based on records of the Fisheries Departments and the Herring Marketing Board. All supplies of canned fish come under war-time control and are covered on an accounting basis.

Shell Eggs

Pre-war estimates of home produced supplies (65 per cent. of the total) are derived from census returns of poultry numbers and are subject to a considerable margin of error. The war-time figures show no great increase in accuracy as even in 1943 only half the estimated supply passed through packing stations and came under Ministry of Food control. The figure for self-suppliers includes (*a*) the estimated production of commercial producers over and above the supplies delivered to packing stations; this covers consumption on farms and the output of small producers with flocks of less than 50 birds which do not come under the scheme and (*b*) an estimate of the production by domestic poultry keepers based on the number of ration documents issued for poultry feed.

Liquid Egg

Entirely imported; pre-war figures are based on import statistics and war-time figures on Ministry of Food records.

Dried Egg

Almost entirely a war-time product; supplies are controlled by the Ministry of Food and covered on an accounting basis.

Butter

About 90 per cent. of pre-war supplies are covered by import and export statistics and 5 per cent. by records of Milk Marketing Boards. The remainder (farmhouse butter) is more roughly estimated from a breakdown of total milk production. Records of stock changes are available for the pre-war period. For the war years supplies are entirely controlled by the Ministry of Food and the figures are on an accounting basis, except for the small remaining farmhouse production which is still estimated.

Margarine and Compound Lard (Shortening)

The pre-war estimates are based on production returns made to the Imperial Economic Committee. War-time figures are based on the records of "Marcom," the agency distributing all supplies on behalf of the Ministry of Food.

Animal Lard, Other Edible Oils and Fats

The pre-war figures are drawn from a number of sources, including import statistics, Bacon Marketing Board records, and returns to the Imperial Economic Committee. The war-time figures are drawn from the records of the Ministry of Food and Marcom.

Sugar

Customs and Excise figures covering imported and home produced sugar and allowing for exports and re-exports of sugar (including sugar in manufactured foods) are available for the pre-war period. For the war years, sugar is entirely controlled and is covered on an accounting basis. Sugar used for condensed milk and for canned fruit and vegetables are excluded as it is duplicated elsewhere in the table. Sugar used for fermented drinks is also excluded.

Jam

The data in Table 16 relate only to imported jam. In order to avoid duplication, home produced jam is included under its constituents, i.e., sugar, fruit and fruit pulp.

Honey

Supplies are small, but are only accurately known for imported honey, the figure for home production being no more than an approximation.

Glucose

The estimates are based on returns by manufacturers; those for the pre-war period relate to one year only, but are believed to be representative. Glucose used for medicinal purposes is included; glucose used for fermented drinks has been deducted.

Potatoes

For the war years, the consumption of commercially grown potatoes is estimated primarily from monthly returns by merchants of deliveries from growers, made in connection with levy or subsidy payments. An allowance is made in these estimates for consumption on farms. The pre-war figures are derived from estimates of total production (based on acreage and yield) with deductions for seed, unmarketable potatoes, wastage, etc.; these figures have been recently revised in the light of war-time experience.

The estimates for consumption by self-suppliers cover potatoes grown in gardens and allotments (see under vegetables).

Dried Pulses

About 85 per cent. of pre-war supplies and more than half the current supplies are covered by import and export statistics: for the war years supplies are imported only by the Ministry of Food and records are also available of stocks and releases. The figures for home produced supplies are derived from estimates of agricultural production for the pre-war period, and for the war years from approved buyers returns of purchases from growers.

Nuts

The small home production is approximately estimated from a pre-war census of agricultural production. The figures for imported supplies, which before the war made up 95 per cent. of the total, are based on Customs returns, supplemented for the war years by Ministry of Food records of stocks and releases.

Fresh Tomatoes

About two-thirds of the pre-war supply are covered by import statistics. Methods of estimating home production by commercial growers and self-suppliers are considered under fresh vegetables.

Canned Tomato Products, Canned Citrus Fruits and Citrus Juice

Supplies are entirely imported. For the war years import statistics are supplemented by Ministry of Food records of stocks and releases.

Fresh Citrus Fruit

The estimates are derived entirely from import statistics. An allowance of 5 per cent. has been made throughout for wastage.

Other Fresh Fruits

For the pre-war period two-thirds of the total supply are covered by import statistics. Home produced supplies (virtually the only fruit available during the war period) are derived from estimates of total production based on returns of acreage, numbers of trees and yields. The estimates for self-suppliers cover garden fruit, taken as a fixed percentage of commercial production. An allowance of 5 per cent. is made for wastage.

Fruit Pulp

In effect only imported supplies are taken into account as a deduction is made for home produced supplies which are duplicated under fresh fruit. Records of the production, stocks and releases of fruit pulp are available for the war years.

Dried Fruit

The whole supply is imported. Pre-war supplies are estimated from import statistics. War-time supplies are entirely controlled by the Ministry of Food and are covered on an accounting basis.

Canned Fruit, Canned Vegetables

Imported supplies are covered by records of arrivals and home produced supplies by production returns by canners. Monthly records of stocks are available for the war years.

Fresh Vegetables

The estimates of commercial production based on census returns of the acreages under each vegetable crop (made annually before the war and quarterly during the war) and on estimated yields. Allowances of 25 per cent. are made for wastage of green and root vegetables, and 5 per cent. for tomatoes ; these allowances are intended to cover vegetables ploughed under and vegetables wasted during marketing and distribution. The consumption estimates obtained in this way are clearly only approximate and tend to be rather higher than those indicated by consumer surveys.

Estimates for self-suppliers cover garden and allotment production. They are based on fairly good estimates of the acreage under allotments, and a rough estimate of the acreage of gardens (used for vegetable growing) based on survey data. Yields are assumed to be lower, but to vary roughly in proportion to commercial yields. The consumption estimates for self-suppliers obtained in this way are in fairly close agreement with consumption survey results for potatoes but are rather higher than consumption survey results for other vegetables.

Flour

The pre-war figures are based on import statistics and on returns of production made by millers to the Board of Trade and the Meat Commission. For the war period full records are available of arrivals, stocks and releases of imported flour which is owned by the Ministry of Food. Home produced flour (whether from home grown or imported wheat) remains the property of the miller and sales are not restricted. Detailed weekly returns are, however, made by each miller of the quantities of wheat and diluent grain milled, and of the production, stocks and deliveries of flour. The total quantity of flour moving into consumption is thus accurately known, but as there is still a free market for flour (subject only to price control) an estimate has to be made of the proportion of the total going to civilian consumption. This is obtained by deducting from the total supply (*a*) any special Services exports (*b*) an allowance for consumption by the home-based forces (whether as bread or flour) based on the numbers feeding in mess and current ration allowances and (*c*) a small allowance for industrial non-food uses.

Rice

Pre-war supplies are estimated from import statistics. Current supplies are wholly controlled by the Ministry of Food and are covered on an accounting basis.

Starch

The pre-war figures are based on returns by trade users for a base year showing the quantities used for industrial and for various food usages. Present supplies are controlled by the Ministry of Food. Allowances are made in the tables for the quantities used for industrial purposes and for the manufacture of glucose.

Other Cereal Foods (Oatmeal, pearl barley, breakfast cereals)

The estimates are based on monthly returns of production, stocks and deliveries made by manufacturers to the Ministry of Food.

Tea, Coffee and Cocoa

The pre-war figures represent average releases from bond for United Kingdom consumption. For the war years, supplies are controlled by the Ministry of Food and are covered on an accounting basis. In the case of cocoa, a deduction is made in the later war years for cocoa beans used for fat extraction.

STATISTICAL METHODS EMPLOYED IN THE ENQUIRY (GENERAL)

There have been included in this final report three Appendices giving in some detail the statistical methods employed in each country to estimate supplies of the more important foodstuffs. It is convenient here, however, to tabulate details of the methods employed to bring the estimated *per capita* supplies of individual foods to a common basis which would enable whole groups to be compared in terms of weights. These methods are explained in the paragraphs in Chapter 6 dealing with particular food groups.

The common denominators used for each food group, the conversion factors used and the data on which they were based are set out below. It may well be that if this line of approach is developed, more exact conversions can be established, but it is believed that those used are sufficiently accurate to give comparisons which are substantially correct. More precise comparisons may be made from the data in Appendix VI, Tables 1 to 17 which show the nutrients derived from each group of foods.

For the food groups not mentioned in the table below (potatoes, vegetables, pulses and nuts, grain products and beverages) it was considered that a valid comparison would be obtained by simple addition of the *per capita* supplies of each food within the group and no conversion factors were therefore employed.

CONVERSION FACTORS FROM ACTUAL WEIGHTS TO "COMMON DENOMINATORS"

	Conversion Factor			Basis of Factor
	U.S.A.	Canada	U.K.	
Dairy Products to Milk Solids				
Liquid milk	0.129	0.125	0.124	Est. dry wt. based on nutrient analyses.
Cream (20% fat)	0.275	0.275	—	Est. dry wt. based on nutrient analyses.
Cream (40% fat)	0.410	—	0.410	Est. dry wt. based on nutrient analyses.
Evaporated and condensed whole milk	0.26	.26 .28	0.30	Est. average milk solids (omitting added sugar) based on nutrient tables.
Condensed skim milk	0.27	0.28	0.27	Est. average milk solids (omitting added sugar) based on nutrient tables.
Whole milk cheese	0.61	0.65	0.65	Est. dry wt. based on nutrient analyses.
Skim milk cheese	0.26	0.26	—	Est. dry wt. based on nutrient analyses.
Dried whole milk	0.96	0.96	0.96	Est. dry wt. based on nutrient analyses.
Dried skim milk	0.96	0.96	0.95	Est. dry wt. based on nutrient analyses.
Skim and buttermilk	0.09	0.09	—	Est. dry wt. based on nutrient analyses.
Malted milk	—	0.96	—	
Meat to Carcase Weight				
Beef (bone out)	—	—	1.25	Records of loss in boning and dissection of carcases.
Canned corned meat	—	2.17	2.5	Est. conversion for S. American corned beef.
Other canned meat	—		1.35	U.S.D.A. conversion factor for pork luncheon meat.
All other types	1.0	1.0	1.0	
Meat to Edible Weight				
Beef (bone in)	0.84	0.84	0.84	Est. of edible portions in nutrient tables.
Veal	0.80	0.75	0.75	Est. of edible portions in nutrient tables.
Mutton	0.78	0.83	0.83	Est. of edible portions in nutrient tables.
Pigmeat	0.80	0.79	—	Est. of edible portions in nutrient tables.
Pork	—	—	0.79	Est. of edible portions in nutrient tables.
Bacon	—	—	0.85	Est. of edible portions in nutrient tables.
Offals Beef (bone out) Canned corned meat Other canned meat	1.0	1.0	1.0	This factor is incorrect for offals, some of which (e.g., tails) include bone, but no data was available on which to make a satisfactory weighting.

CONVERSION FACTORS FROM ACTUAL WEIGHTS TO "COMMON DENOMINATORS"—*contd.*

	Conversion Factor			Basis of Factor
	U.S.A.	Canada	U.K.	
Poultry, game and fish to edible weight				
Poultry	—	—	0.70	Estimates of edible portions in nutrient tables.
Chickens	0.60	0.55	—	
Other poultry	0.67	0.67	—	
Rabbits and game	0.55	0.84	0.80	
Fat fish	0.54	0.55	0.55	Estimates conversion from landed to wet fillet weight.
White fish	1.0	1.0	1.0	Original statistical data as wet fillet wt. or wt. without shell.
Shell fish				
Canned fish	1.0	—	1.0	
Egg products to shell egg equivalent				
Dried egg	—	4.59	4.59	U.S.D.A. factors.
Frozen liquid egg	—	—	1.286	
Fats to fat content				
Butter	0.81	0.81	0.825	Analyses in nutrient tables.
Margarine	0.81	—	0.853	
Lard and shortening	1.0	1.0	0.99	
Other oils and fats	1.0	1.0	1.0	
Sugars and syrups to sugar content				
Cane, beet and corn sugars	1.0	1.0	1.0	Analyses in nutrient tables.
Corn syrup	0.72	.74	—	
Glucose	—	—	0.82	
Honey	0.80	0.80	0.75	
Jam	—	—	0.67	
Maple syrup	0.90	0.90	—	
Molasses	0.60	0.60	—	
Tomato and citrus products to fresh equivalents				
Canned tomatoes	1.5	1.70	1.5	Estimated average values from U.S.D.A. conversion tables (final products to retail weight of fresh material).
Tomato products, purée		1.81		
Canned citrus fruit and unconcentrated juice	2.0	2.0	2.0	
Concentrated juice	14.0	—	14.0	
Other fruit products to fresh equivalents				
Canned fruit	0.9	1.0	0.8	Average values from U.S.D.A. conversion tables roughly weighted according to type of fruit.
Frozen fruit	1.0	1.0	—	
Dried fruit	4.0	4.0	4.0	

SUMMARY OF PER CAPITA SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION
UNITED STATES, 1935–39 TO 1943–44

lb = Lb. per head per annum. % = Per cent. of Pre-War.

		1935–39	1940	1941	1942	1943	1943–44
1. DAIRY PRODUCTS							
Fluid whole milk	(lb)	267.0	269.4	275.9	292.0	334.3	334.1
	(%)	*100*	*101*	*103*	*109*	*125*	*125*
Fluid cream (not used in other products)	(lb)	10.7	10.7	11.0	12.0	11.8	9.8
	(%)	*100*	*100*	*103*	*112*	*110*	*92*
Cheese, cheddar	(lb)	4.0	4.3	4.5	4.6	3.5	2.9
	(%)	*100*	*108*	*112*	*115*	*88*	*72*
Cheese, other	(lb)	1.6	1.7	1.5	1.7	1.4	1.0
	(%)	*100*	*106*	*94*	*106*	*88*	*62*
Evaporated whole	(lb)	15.2	17.5	17.2	16.4	15.3	9.7
	(%)	*100*	*115*	*113*	*108*	*101*	*64*
Condensed whole	(lb)	1.6	1.8	1.7	2.0	1.7	1.6
	(%)	*100*	*112*	*106*	*125*	*106*	*100*
Malted milk	(lb)	.1	.1	.1	.2	.2	.2
	(%)	*100*	*100*	*100*	*200*	*200*	*200*
Dried whole	(lb)	.1	.2	.2	.2	.2	.2
	(%)	*100*	*200*	*200*	*200*	*200*	*200*
Dried skim	(lb)	1.9	2.2	2.5	2.3	.9	1.0
	(%)	*100*	*116*	*132*	*121*	*47*	*53*
Condensed skim	(lb)	2.8	3.1	3.8	4.2	4.3	4.3
	(%)	*100*	*111*	*136*	*150*	*154*	*154*
Cottage cheese	(lb)	1.6	1.9	2.0	2.0	1.9	1.5
	(%)	*100*	*119*	*125*	*125*	*119*	*94*
Skim and buttermilk	(lb)	54.7	57.6	58.7	59.4	61.3	60.7
	(%)	*100*	*105*	*107*	*109*	*112*	*111*
Milk in ice cream (n.e.s.) whole	(lb)	6.0	7.1	8.4	9.2	9.1	9.0
	(%)	*100*	*118*	*140*	*153*	*152*	*150*
Cream (40 per cent.)	(lb)	1.8	2.1	2.5	2.8	1.7	1.7
	(%)	*100*	*117*	*139*	*156*	*94*	*94*
TOTAL DAIRY PRODUCTS (as milk solids)	(lb)	55.0	57.1	58.8	61.4	64.4	61.5
	(%)	*100*	*104*	*107*	*112*	*117*	*112*
2. MEATS							
Beef	(lb)	55.1	55.1	61.4	61.3	51.9	50.8
	(%)	*100*	*100*	*111*	*111*	*94*	*92*
Veal	(lb)	8.1	7.4	7.6	7.8	7.1	7.3
	(%)	*100*	*91*	*94*	*96*	*88*	*90*
Mutton and lamb	(lb)	6.7	6.6	6.9	6.7	6.0	5.1
	(%)	*100*	*99*	*103*	*100*	*90*	*76*
Pork	(lb)	56.5	72.9	67.3	66.6	64.3	68.8
	(%)	*100*	*129*	*119*	*118*	*114*	*122*
Offal	(lb)	8.5	9.9.	9.5	11.0	12.0	12.1
	(%)	*100*	*116*	*112*	*129*	*141*	*142*
TOTAL MEATS (carcase weight)	(lb)	134.9	151.9	152.7	153.4	141.3	144.1
	(%)	*100*	*113*	*113*	*114*	*105*	*107*
(edible weight)	(lb)	111.7	125.5	126.4	127.2	117.4	119.6
	(%)	*100*	*112*	*113*	*114*	*105*	*107*

SUMMARY OF PER CAPITA SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION UNITED STATES, 1935-39 TO 1943-44

lb = Lb. per head per annum. % = Per cent. of Pre-War.

		1935–39	1940	1941	1942	1943	1943–44
3. POULTRY, GAME AND FISH							
Chickens	(lb)	18.0	18.1	19.5	21.8	28.2	28.2
	(%)	*100*	*101*	*108*	*121*	*157*	*157*
Other poultry	(lb)	2.7	3.6	3.6	3.8	3.4	3.4
	(%)	*100*	*133*	*133*	*141*	*126*	*126*
Game	(lb)	2.0	2.0	2.0	2.0	2.0	2.0
	(%)	*100*	*100*	*100*	*100*	*100*	*100*
Fish, cured, fresh and frozen :							
Other fish (fresh fillet basis)	(lb)	6.3	5.6	6.3	5.2	3.8	4.2
	(%)	*100*	*89*	*100*	*83*	*60*	*67*
Shell fish (without shell)	(lb)	1.1	1.1	.9	1.1	1.0	1.1
	(%)	*100*	*100*	*82*	*100*	*91*	*100*
Fish, canned	(lb)	5.0	4.2	4.9	3.4	2.5	2.6
	(%)	*100*	*84*	*98*	*68*	*50*	*52*
TOTAL (edible weight)	(lb)	26.1	25.3	27.3	26.3	27.6	28.2
	(%)	*100*	*97*	*105*	*101*	*106*	*108*
4. EGGS (fresh equivalent)	(lb)	35.6	37.9	37.3	37.5	41.2	39.5
	(%)	*100*	*106*	*105*	*105*	*116*	*111*
5. FATS AND OILS							
Butter	(lb)	16.8	17.0	16.0	15.7	13.3	13.3
	(%)	*100*	*101*	*95*	*93*	*79*	*79*
Lard	(lb)	11.0	14.8	14.3	13.5	13.8	12.8
	(%)	*100*	*135*	*130*	*123*	*125*	*116*
Margarine (retail weight)	(lb)	2.9	2.4	2.8	2.8	4.3	3.9
	(%)	*100*	*83*	*97*	*97*	*148*	*134*
Shortening	(lb)	11.9	9.1	10.5	8.9	8.7	8.0
	(%)	*100*	*76*	*88*	*75*	*73*	*67*
Other oils	(lb)	6.3	7.6	8.4	8.4	7.7	6.4
	(%)	*100*	*121*	*133*	*133*	*122*	*102*
TOTAL FATS AND OILS (fat content)	(lb)	45.1	47.2	48.5	45.8	44.5	41.1
	(%)	*100*	*105*	*108*	*102*	*99*	*91*

SUMMARY OF PER CAPITA SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION
UNITED STATES, 1935–39 TO 1943–44

lb = Lb. per head per annum. % = Per cent. of Pre-War.

		1935–39	1940	1941	1942	1943	1943–44
6. SUGAR AND SYRUPS							
Beet and Cane sugar (refined)	(lb)	91.5	85.5	97.9	84.9	69.6	71.3
	(%)	*100*	*93*	*107*	*93*	*76*	*78*
Corn and maple sugar	(lb)	2.6	3.3	3.9	3.1	2.6	3.0
	(%)	*100*	*127*	*150*	*119*	*100*	*115*
Syrups and edible molasses	(lb)	13.0	12.7	12.5	13.2	13.8	14.6
	(%)	*100*	*98*	*96*	*102*	*106*	*112*
Honey	(lb)	1.4	1.5	1.7	1.4	1.4	1.7
	(%)	*100*	*107*	*121*	*100*	*100*	*121*
Jams, jellies, marmalades and apple butter	(lb)	2.9	2.9	3.0	2.6	3.2	3.2
	(%)	*100*	*100*	*103*	*90*	*110*	*110*
TOTAL SUGAR AND SYRUPS (sugar content) ...	(lb)	105.3	99.9	113.0	99.1	84.0	87.0
	(%)	*100*	*95*	*107*	*94*	*80*	*83*
7. POTATOES							
White potatoes (fresh equivalent) ...	(lb)	123.2	123.6	117.8	119.4	135.0	130.2
	(%)	*100*	*100*	*96*	*97*	*110*	*106*
Sweet potatoes (fresh equivalent) ...	(lb)	19.5	16.0	16.4	18.3	20.1	18.5
	(%)	*100*	*82*	*84*	*94*	*103*	*95*
TOTAL POTATOES	(lb)	142.7	139.6	134.2	137.7	155.1	148.7
	(%)	*100*	*98*	*94*	*96*	*109*	*104*
8. PULSES AND NUTS							
Dry beans...	(lb)	8.9	9.3	8.7	9.5	10.8	10.4
	(%)	*100*	*104*	*98*	*107*	*121*	*117*
Dry peas	(lb)	1.2	.4	.4	.9	1.3	1.6
	(%)	*100*	*33*	*33*	*75*	*108*	*133*
Soya flour and flakes	(lb)	—	—	—	.3	.5	2.1
	(%)	—	—	—	—	—	—
Peanuts	(lb)	4.3	4.8	4.9	5.1	5.8	6.1
	(%)	*100*	*112*	*114*	*119*	*135*	*142*
Tree nuts...	(lb)	1.4	1.6	1.1	1.0	.9	1.1
	(%)	*100*	*114*	*79*	*71*	*64*	*79*
TOTAL PULSES AND NUTS	(lb)	15.8	16.1	15.1	16.8	19.3	21.3
	(%)	*100*	*102*	*96*	*106*	*122*	*135*

SUMMARY OF PER CAPITA SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION
UNITED STATES, 1935–39 TO 1943–44

lb = Lb. per head per annum. % = Per cent. of Pre-War.

		1935–39	1940	1941	1942	1943	1943–44
9. TOMATOES AND CITRUS							
Fresh tomatoes	(lb)	21.3	21.4	22.6	23.3	25.3	25.8
	(%)	*100*	*100*	*106*	*109*	*119*	*121*
Canned tomatoes and tomato products	(lb)	12.1	13.5	13.8	15.9	11.4	11.0
	(%)	*100*	*112*	*114*	*131*	*94*	*91*
Fresh citrus	(lb)	42.8	49.4	50.5	46.3	49.6	53.3
	(%)	*100*	*115*	*118*	*108*	*116*	*124*
Canned citrus and juices :							
(*a*) concentrated	(lb)	N.A.	N.A.	.4	.3	.2	.8
	(%)	—	—	—	—	—	—
(*b*) unconcentrated	(lb)	3.0	5.3	5.4	4.6	4.1	4.2
	(%)	*100*	*177*	*180*	*153*	*137*	*140*
TOTAL (fresh equivalent)	(lb)	88.3	101.7	111.0	106.9	103.0	115.2
	(%)	*100*	*115*	*126*	*121*	*117*	*130*
10. OTHER FRUITS							
Fresh, including melons	(lb)	112.1	110.9	110.6	93.7	75.0	71.9
	(%)	*100*	*99*	*99*	*84*	*67*	*64*
Canned	(lb)	17.4	20.5	21.3	16.0	10.8	11.4
	(%)	*100*	*118*	*122*	*92*	*62*	*66*
Frozen	(lb)	.7	1.2	1.3	1.7	1.4	1.3
	(%)	*100*	*171*	*186*	*243*	*200*	*186*
Dried	(lb)	5.7	6.4	4.6	4.5	4.5	4.4
	(%)	*100*	*112*	*81*	*79*	*79*	*77*
TOTAL OTHER FRUIT (fresh equivalent)	(lb)	151.3	156.2	149.5	127.8	104.1	101.1
	(%)	*100*	*103*	*99*	*84*	*69*	*67*
11. LEAFY, GREEN AND YELLOW VEGETABLES							
Fresh cabbage and greens	(lb)	49.5	49.5	48.2	50.8	50.8	50.5
	(%)	*100*	*100*	*97*	*103*	*103*	*102*
Fresh carrots	(lb)	10.1	10.6	10.5	10.7	9.8	8.8
	(%)	*100*	*105*	*104*	*106*	*97*	*87*
Fresh legumes	(lb)	14.4	15.0	14.5	15.3	17.1	17.4
	(%)	*100*	*104*	*101*	*106*	*119*	*121*
Canned	(lb)	11.7	14.2	15.1	16.6	15.7	16.3
	(%)	*100*	*121*	*129*	*142*	*134*	*139*
Frozen	(lb)	—	—	—	—	—	1.2
	(%)	—	—	—	—	—	—
Dehydrated	(lb)	—	—	—	—	—	.1
	(%)	—	—	—	—	—	—
TOTAL LEAFY, GREEN AND YELLOW VEGETABLES	(lb)	85.7	89.3	88.3	93.4	93.4	94.3
	(%)	*100*	*104*	*103*	*109*	*109*	*110*

SUMMARY OF PER CAPITA SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION
UNITED STATES, 1935–39 TO 1943–44

lb = Lb. per head per annum. % = Per cent. of Pre-War.

		1935–39	1940	1941	1942	1943	1943–44
12. OTHER VEGETABLES							
Fresh	(lb)	54.5	51.5	55.0	56.9	55.3	55.5
	(%)	*100*	*94*	*101*	*104*	*101*	*102*
Canned	(lb)	7.8	8.2	10.9	10.2	10.1	10.2
	(%)	*100*	*105*	*140*	*131*	*129*	*131*
Frozen	(lb)	—	—	—	—	—	.2
	(%)	—	—	—	—	—	—
Dehydrated	(lb)	—	—	—	—	—	.2
	(%)	—	—	—	—	—	—
TOTAL OTHER VEGETABLES	(lb)	62.3	59.7	65.9	67.1	65.4	66.1
	(%)	*100*	*96*	*106*	*108*	*105*	*106*
13. GRAIN PRODUCTS							
Barley	(lb)	.6	.5	.6	.6	.9	.9
	(%)	*100*	*88*	*106*	*106*	*147*	*147*
Corn cereals	(lb)	1.7	1.9	2.3	2.5	2.4	2.8
	(%)	*100*	*109*	*134*	*147*	*141*	*162*
Corn meal	(lb)	24.0	23.8	22.7	22.1	21.0	16.7
	(%)	*100*	*100*	*95*	*96*	*102*	*81*
Corn starch	(lb)	1.4	1.3	1.5	2.1	2.2	3.3
	(%)	*100*	*95*	*114*	*155*	*164*	*240*
Hominy grits	(lb)	1.2	1.7	1.5	1.8	1.8	1.4
	(%)	*100*	*135*	*122*	*148*	*148*	*113*
Oatmeal	(lb)	3.9	3.9	4.0	4.4	4.5	5.3
	(%)	*100*	*101*	*103*	*113*	*116*	*138*
Rice (milled)	(lb)	6.2	6.1	5.5	6.2	5.9	6.0
	(%)	*100*	*98*	*89*	*100*	*95*	*97*
Rye flour	(lb)	2.3	2.2	2.5	2.7	2.8	2.8
	(%)	*100*	*97*	*110*	*121*	*123*	*123*
Wheat cereals	(lb)	3.6	3.5	3.4	3.9	4.0	4.0
	(%)	*100*	*98*	*95*	*110*	*112*	*112*
Wheat flour	(lb)	155.8	153.5	154.8	156.4	155.7	157.7
	(%)	*100*	*99*	*99*	*100*	*100*	*101*
TOTAL GRAIN PRODUCTS	(lb)	200.7	198.4	198.8	202.7	201.2	200.9
	(%)	*100*	*99*	*99*	*101*	*100*	*100*
14. BEVERAGES							
Tea, black	(lb)	.7	.7	.8	.5	.4	.5
	(%)	*100*	*100*	*114*	*71*	*57*	*71*
Coffee, green	(lb)	11.8	13.0	13.4	11.0	11.3	13.9
	(%)	*100*	*111*	*114*	*94*	*96*	*119*
Cocoa beans (all uses)	(lb)	3.5	3.9	3.8	3.1	2.6	3.0
	(%)	*100*	*111*	*109*	*89*	*75*	*86*
TOTAL BEVERAGES	(lb)	16.0	17.6	18.0	14.6	14.3	17.4
	(%)	*100*	*110*	*112*	*91*	*89*	*109*

SUMMARY OF PER CAPITA SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION CANADA, 1935-39 TO 1943

lb=Lb. per head per annum. %=Per cent. of Pre-War.

		1935–39	1940	1941	1942	1943	1943–44
1. DAIRY PRODUCTS							
Fluid whole milk	(lb)	345.1	350.9	346.5	367.5	386.8	
	(%)	*100*	*102*	*100*	*106*	*112*	
Fluid cream	(lb)	12.7	13.0	12.9	13.6	14.4	
	(%)	*100*	*102*	*102*	*107*	*113*	
Cheese, cheddar style	(lb)	3.4	3.3	4.1	3.3	3.4	
	(%)	*100*	*97*	*121*	*97*	*100*	
Cheese, other	(lb)	.3	.3	.3	.3	.3	
	(%)	*100*	*100*	*100*	*100*	*100*	
Cottage cheese	(lb)	.1	.2	.2	.2	.2	
	(%)	*100*	*200*	*200*	*200*	*200*	
Evaporated whole	(lb)	6.1	8.3	8.9	11.2	12.1	
	(%)	*100*	*136*	*146*	*184*	*198*	
Condensed whole	(lb)	.6	.6	.4	.7	.6	
	(%)	*100*	*100*	*67*	*117*	*100*	
Malted milk powder	(lb)	.1	.09	.05	.07	.08	
	(%)	*100*	*90*	*50*	*70*	*80*	
Dried whole	(lb)	.1	.08	.2	.4	.6	
	(%)	*100*	*80*	*200*	*400*	*600*	
Dried skim	(lb)	1.8	2.3	2.4	2.3	2.1	
	(%)	*100*	*128*	*133*	*128*	*117*	
Condensed skim	(lb)	.4	.4	.4	.5	.4	
	(%)	*100*	*100*	*100*	*125*	*100*	
Skim and buttermilk	(lb)	2.6	2.8	3.5	5.8	5.2	
	(%)	*100*	*108*	*135*	*223*	*200*	
Whole milk in ice cream	(lb)	13.0	15.4	19.8	21.4	22.5	
	(%)	*100*	*118*	*152*	*165*	*173*	
TOTAL DAIRY PRODUCTS (Milk Solids)	(lb)	54.6	57.0	57.6	61.1	64.3	
	(%)	*100*	*104*	*105*	*112*	*118*	
2. MEATS							
Beef with bone	(lb)	54.4	54.4	58.3	59.5	70.1	
	(%)	*100*	*100*	*107*	*109*	*129*	
Veal	(lb)	10.4	10.7	11.0	10.2	9.1	
	(%)	*100*	*103*	*106*	*98*	*87*	
Mutton and lamb	(lb)	5.5	4.4	4.7	4.9	5.0	
	(%)	*100*	*80*	*85*	*89*	*91*	
Pork	(lb)	40.4	42.8	42.5	44.2	40.9	
	(%)	*100*	*106*	*105*	*109*	*101*	
Offals	(lb)	5.9	5.5	6.1	6.2	7.1	
	(%)	*100*	*93*	*103*	*105*	*120*	
Canned meat	(lb)	1.4	1.1	1.8	1.3	1.0	
	(%)	*100*	*79*	*129*	*93*	*71*	
TOTAL MEATS (edible weight)	(lb)	97.3	97.8	102.6	104.1	110.3	
	(%)	*100*	*101*	*105*	*107*	*113*	
(carcase weight)	(lb)	120.1	120.1	126.5	127.8	134.4	
	(%)	*100*	*100*	*105*	*106*	*112*	

SUMMARY OF PER CAPITA SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION
CANADA, 1935–39 TO 1943

lb = Lb. per head per annum. % = Per cent. of Pre-War.

		1935–39	1940	1941	1942	1943	1943–44
3. POULTRY, GAME AND FISH							
Chickens	(lb)	15.5	16.7	16.3	19.3	18.7	
	(%)	*100*	*108*	*105*	*125*	*121*	
Other poultry	(lb)	2.7	4.0	3.6	5.2	4.7	
	(%)	*100*	*148*	*133*	*193*	*174*	
Game and rabbits	(lb)	4.3	4.3	4.3	4.3	4.3	
	(%)	*100*	*100*	*100*	*100*	*100*	
Fresh and frozen fish	(lb)	8.8	8.8	4.9	4.5	4.5	
	(%)	*100*	*100*	*56*	*51*	*51*	
Shell fish	(lb)	.4	.4	.5	.3	.3	
	(%)	*100*	*100*	*125*	*75*	*75*	
Canned fish	(lb)	2.7	2.7	2.9	4.4	4.4	
	(%)	*100*	*100*	*107*	*163*	*163*	
TOTAL POULTRY, GAME AND FISH (edible weight)	(lb)	25.8	27.4	23.3	26.9	26.2	
	(%)	*100*	*106*	*90*	*104*	*102*	
4. EGGS							
Fresh	(lb)	30.1	29.9	30.2	31.2	37.5	
	(%)	*100*	*99*	*100*	*104*	*125*	
Dried	(lb)	.1	.08	.07	.2	.06	
	(%)	*100*	*80*	*70*	*200*	*60*	
TOTAL EGGS (fresh equivalent)	(lb)	30.5	30.3	30.5	32.1	37.8	
	(%)	*100*	*99*	*100*	*105*	*124*	
5. OILS AND FATS							
Butter	(lb)	30.8	30.8	30.7	33.1	29.6	
	(%)	*100*	*100*	*100*	*107*	*96*	
Lard	(lb)	4.0	6.9	7.4	9.0	9.1	
	(%)	*100*	*172*	*185*	*225*	*228*	
Shortening	(lb)	10.5	7.4	10.1	8.8	8.4	
	(%)	*100*	*70*	*96*	*84*	*80*	
Other oils and fats	(lb)	1.8	1.9	1.9	2.1	2.1	
	(%)	*100*	*106*	*106*	*117*	*117*	
TOTAL OILS AND FATS (fat content)	(lb)	41.2	41.1	44.3	46.7	43.6	
	(%)	*100*	*100*	*108*	*113*	*106*	

SUMMARY OF PER CAPITA SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION CANADA, 1935–39 TO 1943

lb = Lb. per head per annum. % = Per cent. of Pre-War.

		1935–39	1940	1941	1942	1943	1943–44
6. SUGARS AND SYRUPS							
Refined suagr	(lb)	90.6	96.2	100.3	77.7	72.1	
	(%)	*100*	*106*	*111*	*86*	*80*	
Maple sugar	(lb)	1.8	2.1	1.3	2.0	1.7	
	(%)	*100*	*117*	*72*	*111*	*94*	
Corn and other syrups	(lb)	1.0	.6	.7	1.7	1.4	
	(%)	*100*	*60*	*70*	*170*	*140*	
Molasses	(lb)	3.7	3.9	4.1	3.9	3.9	
	(%)	*100*	*105*	*111*	*105*	*105*	
Honey	(lb)	2.4	1.4	1.9	2.1	2.8	
	(%)	*100*	*58*	*79*	*87*	*117*	
TOTAL SUGARS AND SYRUPS (sugar content)	(lb)	97.0	101.9	106.0	84.8	79.1	
	(%)	*100*	*105*	*109*	*87*	*82*	
7. POTATOES							
White potatoes	(lb)	191.1	201.8	201.4	203.7	204.7	
	(%)	*100*	*106*	*105*	*107*	*107*	
Sweet potatoes	(lb)	.6	.6	.6	.7	.4	
	(%)	*100*	*100*	*100*	*117*	*67*	
TOTAL POTATOES	(lb)	191.7	202.4	202.0	204.4	205.1	
	(%)	*100*	*106*	*105*	*107*	*107*	
8. PULSES AND NUTS							
Dry beans...	(lb)	3.6	3.9	3.8	7.8	4.9	
	(%)	*100*	*108*	*106*	*217*	*136*	
Dry peas	(lb)	5.6	4.7	4.5	4.1	5.4	
	(%)	*100*	*84*	*80*	*73*	*96*	
Soybeans	(lb)	.1	.1	.1	.1	.1	
	(%)	*100*	*125*	*200*	*250*	*225*	
Peanuts	(lb)	2.2	2.8	3.1	1.0	1.2	
	(%)	*100*	*127*	*141*	*45*	*55*	
Tree nuts	(lb)	1.1	1.2	.7	.6	.1	
	(%)	*100*	*109*	*64*	*55*	*4*	
TOTAL PULSES AND NUTS	(lb)	12.6	12.7	12.2	13.6	11.7	
	(%)	*100*	*101*	*97*	*108*	*93*	

SUMMARY OF PER CAPITA SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION CANADA, 1935–39 TO 1943

lb = Lb. per head per annum. % = Per cent. of Pre-War.

		1935–39	1940	1941	1942	1943	1943–44
9. TOMATOES AND CITRUS							
Fresh tomatoes	(lb)	8.3	5.1	8.2	3.8	6.9	
	(%)	*100*	*61*	*99*	*46*	*83*	
Canned tomatoes and products	(lb)	9.5	10.4	12.9	15.2	8.8	
	(%)	*100*	*109*	*136*	*160*	*93*	
Tomatoes, pulp, purée, etc.	(lb)	.4	3.2	.3	1.7	1.0	
	(%)	*100*	*800*	*75*	*425*	*250*	
Fresh citrus	(lb)	25.0	27.3	29.8	33.3	37.6	
	(%)	*100*	*109*	*119*	*133*	*150*	
Canned citrus	(lb)	.5	1.0	1.8	1.4	.1	
	(%)	*100*	*200*	*360*	*280*	*20*	
TOTAL TOMATOES AND CITRUS (as fresh)	(lb)	51.1	57.9	64.0	68.8	61.5	
	(%)	*100*	*113*	*125*	*135*	*120*	
10. OTHER FRUIT							
Fresh fruit	(lb)	40.3	48.9	58.2	37.3	39.1	
	(%)	*100*	*121*	*144*	*93*	*97*	
Canned fruit	(lb)	6.3	6.3	6.5	7.8	3.5	
	(%)	*100*	*100*	*103*	*124*	*56*	
Frozen fruit	(lb)	0.2	0.1	0.4	0.1	0.2	
	(%)	*100*	*50*	*200*	*50*	*100*	
Dried fruit	(lb)	8.2	8.2	7.5	6.2	7.4	
	(%)	*100*	*100*	*91*	*76*	*90*	
TOTAL OTHER FRUIT (fresh equivalent)	(lb)	79.6	88.1	95.1	70.0	72.4	
	(%)	*100*	*111*	*119*	*88*	*91*	
11. LEAFY, GREEN AND YELLOW VEGETABLES							
Fresh cabbage and spinach	(lb)	12.5	12.3	14.1	19.9	12.3	
	(%)	*100*	*98*	*113*	*159*	*98*	
Lettuce	(lb)	3.6	3.6	3.8	4.1	3.6	
	(%)	*100*	*100*	*106*	*114*	*100*	
Fresh carrots	(lb)	15.3	14.9	11.9	22.2	17.6	
	(%)	*100*	*97*	*78*	*145*	*115*	
Fresh legumes	(lb)	6.1	4.4	4.2	5.6	3.2	
	(%)	*100*	*72*	*69*	*92*	*52*	
Canned (net contents)—							
Cabbage and spinach	(lb)	.4	.5	.7	.4	.2	
	(%)	*100*	*125*	*175*	*100*	*50*	
Carrots	(lb)	.05	.07	.07	.2	.2	
	(%)	*100*	*140*	*140*	*400*	*400*	
Legumes	(lb)	5.9	6.5	8.8	9.5	6.1	
	(%)	*100*	*110*	*149*	*161*	*103*	
TOTAL LEAFY, GREEN AND YELLOW VEGETABLES	(lb)	43.9	42.3	43.6	61.9	43.2	
	(%)	*100*	*96*	*99*	*141*	*98*	

SUMMARY OF PER CAPITA SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION
CANADA, 1935–39 TO 1943

lb = Lb. per head per annum % = Per cent. of Pre-War

		1935–39	1940	1941	1942	1943	1943–44
12. OTHER VEGETABLES							
Fresh	(lb)	29.6	27.6	22.9	36.3	28.1	
	(%)	*100*	*93*	*77*	*123*	*95*	
Canned (net contents)	(lb)	4.4	3.5	4.5	5.0	4.7	
	(%)	*100*	*80*	*102*	*114*	*107*	
TOTAL OTHER VEGETABLES	(lb)	34.0	31.1	27.4	41.3	32.8	
	(%)	*100*	*91*	*81*	*121*	*96*	
13. GRAIN PRODUCTS							
Pot and pearl barley	(lb)	.3	.3	.3	.4	.5	
	(%)	*100*	*100*	*100*	*133*	*167*	
Corn meal and flour	(lb)	1.4	.9	.3	.4	.5	
	(%)	*100*	*64*	*21*	*29*	*36*	
Corn starch	(lb)	2.2	1.5	1.9	1.8	2.0	
	(%)	*100*	*68*	*86*	*82*	*91*	
Buckwheat flour	(lb)	.2	.1	.1	.1	.1	
	(%)	*100*	*50*	*50*	*50*	*50*	
Oatmeal and rolled oats	(lb)	7.3	5.7	7.5	6.3	7.6	
	(%)	*100*	*78*	*103*	*86*	*104*	
Rice (milled)	(lb)	4.3	3.6	4.0	2.8	4.0	
	(%)	*100*	*84*	*93*	*65*	*93*	
Rye (flour)	(lb)	.3	.2	.2	.4	.4	
	(%)	*100*	*67*	*67*	*133*	*133*	
Wheat cereals (including other)	(lb)	7.4	4.9	6.4	5.9	5.8	
	(%)	*100*	*66*	*86*	*80*	*78*	
White flour	(lb)	183.2	157.5	159.5	177.2	194.5	
	(%)	*100*	*86*	*87*	*97*	*106*	
Tapioca, sago and arrowroot	(lb)	.3	.3	.3	.1	.03	
	(%)	*100*	*100*	*100*	*33*	*10*	
TOTAL GRAIN PRODUCTS	(lb)	206.9	175.0	180.5	195.4	215.4	
	(%)	*100*	*85*	*87*	*94*	*104*	
14. BEVERAGES							
Tea	(lb)	3.5	3.6	3.2	2.7	2.1	
	(%)	*100*	*103*	*91*	*77*	*60*	
Coffee (green beans)	(lb)	3.6	3.6	4.3	3.9	4.0	
	(%)	*100*	*100*	*119*	*108*	*111*	
Cocoa (green beans)	(lb)	3.7	4.7	5.3	3.9	4.4	
	(%)	*100*	*127*	*143*	*105*	*119*	
TOTAL BEVERAGES	(lb)	10.8	11.9	12.8	10.5	10.5	
	(%)	*100*	*110*	*119*	*97*	*97*	

SUMMARY OF PER CAPITA SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION UNITED KINGDOM, 1934–38 TO 1943–44

lb = Lb. per head per annum. % = Per cent. of Pre-War.

		1934–38	1940	1941	1942	1943	1943–44
1. DAIRY PRODUCTS							
Fluid milk	(lb)	217.7	230.7	264.0	282.6	291.6	295.2
	(%)	*100*	*106*	*121*	*130*	*134*	*136*
Cream (40 per cent.)	(lb)	1.3	.5	—	—	—	—
	(%)	*100*	*39*	—	—	—	—
Evaporated milk (F.C.U.)	(lb)	2.4	1.2	3.6	3.0	1.2	1.4
	(%)	*100*	*50*	*150*	*125*	*50*	*58*
Condensed milk (F.C.S.)	(lb)	4.0	3.2	.7	1.3	1.0	1.3
	(%)	*100*	*80*	*18*	*32*	*25*	*32*
Condensed skim (M.S.S.)	(lb)	5.9	3.6	1.2	1.1	1.6	1.5
	(%)	*100*	*61*	*20*	*19*	*27*	*25*
Dried whole milk	(lb)	.6	.5	.4	.6	.8	.8
	(%)	*100*	*83*	*67*	*100*	*133*	*133*
Dried skim milk	(lb)	1.0	1.1	.4	2.3	3.6	2.9
	(%)	*100*	*110*	*40*	*230*	*360*	*290*
Cheese	(lb)	8.8	8.2	8.3	14.1	11.8	11.4
	(%)	*100*	*93*	*94*	*160*	*134*	*130*
TOTAL DAIRY PRODUCTS (as milk solids)	(lb)	38.3	38.0	40.5	48.6	49.2	48.8
	(%)	*100*	*99*	*106*	*127*	*128*	*127*
MEAT							
Beef bone in (including veal)	(lb)	55.6	45.8	36.3	24.6	23.5	23.2
	(%)	*100*	*82*	*65*	*44*	*42*	*42*
Beef bone out	(lb)	1.7	2.2	7.0	15.6	10.6	11.4
	(%)	*100*	*129*	*412*	*918*	*624*	*671*
Mutton and lamb	(lb)	26.9	30.1	21.7	24.1	24.0	24.7
	(%)	*100*	*112*	*81*	*90*	*89*	*92*
Pork	(lb)	12.7	9.8	6.8	4.7	8.0	8.7
	(%)	*100*	*77*	*54*	*37*	*63*	*69*
Offals	(lb)	6.7	7.1	6.1	5.6	5.4	6.1
	(%)	*100*	*103*	*91*	*84*	*81*	*91*
Canned corned meat	(lb)	2.1	—	.4	2.4	3.4	2.4
	(%)	*100*	—	*19*	*114*	*162*	*114*
Other canned meat	(lb)	.8	1.1	2.0	5.0	4.8	5.0
	(%)	*100*	*138*	*250*	*625*	*600*	*625*
Bacon and ham	(lb)	26.0	20.1	19.1	19.5	18.1	18.8
	(%)	*100*	*77*	*74*	*75*	*70*	*72*
TOTAL MEATS (as carcase weight)	(lb)	136.4	117.2	102.5	110.8	107.3	108.6
	(%)	*100*	*86*	*75*	*81*	*79*	*80*
(as edible weight)	(lb)	112.4	98.7	85.6	89.6	85.5	87.8
	(%)	*100*	*86*	*76*	*80*	*76*	*78*

SUMMARY OF PER CAPITA SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION UNITED KINGDOM, 1934–38 TO 1943–44

lb = Lb. per head per annum. % = Per cent. of Pre-War.

		1934–38	1940	1941	1942	1943	1943–44
3. POULTRY, GAME AND FISH							
Poultry	(lb)	4.1	3.4	3.4	3.0	2.7	2.7
	(%)	*100*	*83*	*83*	*73*	*66*	*66*
Game and rabbits	(lb)	3.7	4.0	3.2	2.6	2.5	2.4
	(%)	*100*	*108*	*86*	*70*	*68*	*65*
Fish, fresh and frozen—white	(lb)	16.5	9.3	9.3	10.6	8.9	8.9
	(%)	*100*	*56*	*56*	*64*	*54*	*54*
,, ,, ,, ,, fatty	(lb)	3.4	1.8	2.0	2.4	2.1	1.9
	(%)	*100*	*53*	*59*	*71*	*62*	*56*
Shell fish	(lb)	1.3	.8	.8	.8	.9	.8
	(%)	*100*	*62*	*62*	*62*	*69*	*62*
Canned fish	(lb)	3.6	5.2	3.4	2.8	3.0	3.5
	(%)	*100*	*144*	*94*	*78*	*83*	*97*
TOTAL POULTRY, GAME AND FISH ... (edible weight) ...	(lb)	30.6	22.7	20.5	20.8	18.8	18.9
	(%)	*100*	*74*	*67*	*68*	*61*	*62*
4. EGGS							
Shell eggs	(lb)	21.8	19.1	15.9	11.4	9.7	8.6
	(%)	*100*	*88*	*73*	*52*	*44*	*39*
Dried eggs	(lb)	.05	.1	.1	1.9	2.8	3.4
	(%)	*100*	—	—	—	—	—
Liquid egg	(lb)	1.9	2.4	1.5	.3	.2	.7
	(%)	*100*	*126*	*79*	*16*	*10*	*37*
TOTAL EGGS (shell egg equivalent)... ...	(lb)	24.4	22.7	18.3	20.5	22.9	25.1
	(%)	*100*	*93*	*75*	*84*	*94*	*103*
5. OILS AND FATS							
Butter	(lb)	24.8	13.4	10.2	7.8	7.6	7.4
	(%)	*100*	*54*	*41*	*32*	*31*	*30*
Margarine	(lb)	9.0	15.4	17.9	17.7	17.3	17.4
	(%)	*100*	*171*	*199*	*197*	*192*	*193*
Lard and compound lard	(lb)	9.3	9.1	10.1	12.0	11.8	11.5
	(%)	*100*	*98*	*109*	*129*	*127*	*124*
Other edible oils and fats	(lb)	8.2	7.5	6.3	6.9	5.6	5.6
	(%)	*100*	*92*	*77*	*84*	*68*	*68*
TOTAL OILS AND FATS (fat content)... ...	(lb)	45.6	40.7	40.0	40.3	38.4	37.9
	(%)	*100*	*89*	*88*	*88*	*84*	*83*
6. SUGAR AND SYRUPS							
Refined sugar	(lb)	89.5	65.7	60.2	63.2	62.1	63.1
	(%)	*100*	*73*	*67*	*71*	*69*	*71*
Jam and marmalade (imported) ...	(lb)	.1	.0	.3	—	1.5	2.4
	(%)	*100*	—	—	—	—	—
Honey	(lb)	.4	.4	.3	.4	.3	.2
	(%)	*100*	*100*	*75*	*100*	*75*	*50*
Glucose	(lb)	5.6	5.4	3.0	2.5	2.1	2.1
	(%)	*100*	*96*	*54*	*45*	*38*	*38*
TOTAL SUGAR AND SYRUP (sugar content)...	(lb)	94.5	70.4	63.1	65.6	65.0	66.6
	(%)	*100*	*74*	*67*	*69*	*69*	*70*

SUMMARY OF PER CAPITA SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION
UNITED KINGDOM, 1934–38 TO 1943–44

lb = Lb. per head per annum. % = Per cent. of Pre-War.

		1934–38	1940	1941	1942	1943	1943–44
7. **POTATOES**	(lb)	177.0	178.8	204.6	248.6	255.8	255.8
	(%)	*100*	*101*	*116*	*140*	*144*	*144*
8. **PULSES AND NUTS**							
Dried pulses	(lb)	7.3	4.6	6.3	5.2	3.6	3.0
	(%)	*100*	*63*	*86*	*71*	*49*	*41*
Soya flour and grits	(lb)	—	—	.3	.7	1.7	1.9
	(%)	*100*	—	—	—	—	—
Edible nuts	(lb)	2.2	2.1	.6	.6	.3	1.2
	(%)	*100*	*96*	*27*	*27*	*14*	*54*
TOTAL PULSES AND NUTS	(lb)	9.5	6.7	7.2	6.5	5.6	6.1
	(%)	*100*	*70*	*76*	*68*	*59*	*64*
9. **TOMATOES AND CITRUS**							
Fresh tomatoes	(lb)	10.9	8.6	9.1	10.8	11.0	10.8
	(%)	*100*	*79*	*84*	*99*	*101*	*99*
Canned tomatoes...	(lb)	2.0	—	—	2.8	—	.1
	(%)	*100*	—	—	*140*	—	*5*
Tomato purée	(lb)	—	—	—	.7	.1	.1
	(%)	*100*	—	—	—	—	—
Fresh citrus	(lb)	28.5	20.9	4.2	5.0	2.2	2.6
	(%)	*100*	*73*	*15*	*18*	*8*	*9*
Citrus juice (as unconc.) and canned citrus	(lb)	2.2	1.0	3.5	3.5	4.9	4.9
	(%)	*100*	*45*	*159*	*159*	*223*	*223*
TOTAL TOMATOES AND CITRUS (fresh fruit equivalent)	(lb)	46.8	31.5	16.8	28.1	23.2	23.6
	(%)	*100*	*67*	*36*	*60*	*50*	*50*
10. **OTHER FRUITS**							
Fresh	(lb)	51.1	38.5	14.1	33.6	22.6	23.1
	(%)	*100*	*75*	*28*	*66*	*44*	*45*
Fruit pulp (imported)	(lb)	2.2	.1	1.7	.3	2.0	1.9
	(%)	*100*	*4*	*77*	*14*	*91*	*86*
Dried	(lb)	8.0	7.7	7.8	8.6	6.2	7.3
	(%)	*100*	*96*	*98*	*108*	*78*	*91*
Canned	(lb)	10.2	7.6	1.8	2.6	3.3	1.1
	(%)	*100*	*74*	*18*	*26*	*32*	*11*
TOTAL OTHER FRUITS (fresh equivalent) ...	(lb)	93.5	75.5	48.4	70.4	52.0	55.1
	(%)	*100*	*81*	*52*	*75*	*56*	*59*

SUMMARY OF PER CAPITA SUPPLIES OF FOOD MOVING INTO CIVILIAN CONSUMPTION
UNITED KINGDOM, 1934–38 TO 1943–44

lb = Lb. per head per annum. % = Per cent. of Pre-War.

		1934–38	1940	1941	1942	1943	1943–44
11. LEAFY, GREEN AND YELLOW VEGETABLES							
Cabbage and greens	(lb)	71.5	70.9	74.3	83.0	89.1	89.1
	(%)	*100*	*99*	*104*	*116*	*125*	*125*
Lettuce	(lb)	5.7	6.5	7.3	8.3	8.7	8.7
	(%)	*100*	*114*	*128*	*146*	*153*	*153*
Carrots	(lb)	12.4	11.9	19.6	21.5	21.3	21.3
	(%)	*100*	*96*	*158*	*173*	*172*	*172*
Fresh legumes	(lb)	8.6	8.7	9.9	12.0	12.6	12.6
	(%)	*100*	*101*	*115*	*140*	*146*	*146*
Canned (including green peas)	(lb)	1.1	1.2	1.4	1.0	1.0	.1
	(%)	*100*	*109*	*127*	*91*	*91*	*9*
TOTAL LEAFY, GREEN AND YELLOW VEGETABLES	(lb)	99.3	98.2	112.5	125.8	132.7	132.7
	(%)	*100*	*99*	*113*	*127*	*134*	*134*
12. OTHER VEGETABLES							
Fresh	(lb)	47.6	40.5	50.5	60.5	64.0	64.0
	(%)	*100*	*85*	*106*	*127*	*134*	*134*
Canned	(lb)	1.0	.7	.5	.5	.4	—
	(%)	*100*	*70*	*50*	*50*	*40*	—
TOTAL OTHER VEGETABLES	(lb)	48.6	41.2	51.0	61.0	64.4	64.0
	(%)	*100*	*85*	*105*	*126*	*132*	*132*
13. GRAIN PRODUCTS							
Flour	(lb)	195.0	208.6	237.1	227.1	229.9	230.7
	(%)	*100*	*107*	*122*	*117*	*118*	*118*
Pearl barley	(lb)	.7	.6	.7	.6	.6	1.1
	(%)	*100*	*86*	*100*	*86*	*86*	*157*
Oatmeal and flakes	(lb)	5.2	5.2	7.4	9.7	10.3	9.9
	(%)	*100*	*100*	*142*	*186*	*198*	*190*
Tapioca, sago and arrowroot	(lb)	.8	1.1	.6	.2	—	—
	(%)	*100*	*138*	*75*	*25*	—	—
Breakfast cereals	(lb)	2.7	2.2	2.0	2.1	2.1	2.4
	(%)	*100*	*82*	*74*	*78*	*78*	*89*
Rice	(lb)	4.4	6.5	6.4	3.5	3.4	3.8
	(%)	*100*	*148*	*146*	*80*	*77*	*86*
Starch	(lb)	2.2	1.9	1.6	1.6	1.1	1.3
	(%)	*100*	*86*	*73*	*73*	*50*	*59*
TOTAL GRAIN PRODUCTS	(lb)	211.0	226.1	255.8	244.8	247.4	249.2
	(%)	*100*	*107*	*121*	*116*	*117*	*118*
14. BEVERAGES							
Tea	(lb)	9.3	8.7	8.2	8.3	7.4	7.4
	(%)	*100*	*94*	*88*	*89*	*80*	*80*
Coffee	(lb)	.7	1.0	1.2	1.1	.9	.9
	(%)	*100*	*143*	*171*	*157*	*129*	*129*
Cocoa	(lb)	3.5	5.8	5.3	4.5	4.0	3.5
	(%)	*100*	*166*	*151*	*129*	*114*	*100*
TOTAL BEVERAGES	(lb)	13.5	15.5	14.7	13.9	12.3	11.8
	(%)	*100*	*115*	*109*	*103*	*91*	*87*

ESTIMATED NUTRIENT REQUIREMENTS OF THE UNITED STATES, CANADA AND THE UNITED KINGDOM—1943 CIVILIAN POPULATIONS
(WEIGHTINGS OF THE U.S. NATIONAL RESEARCH COUNCIL DAILY ALLOWANCE OF NUTRIENTS)

	Recommended Allowances								
	Calories	Protein (gm.)	Calcium (gm.)	Iron (mgm.)	Vitamin A (I.U.)	Thiamin (mgm.)	Ascorbic Acid(mgm.)	Riboflavin (mgm.)	Niacin (mgm.)
CHILDREN									
Under 1 year	900	36	1.0	6	1,500	0.4	30	0.6	4
1–3 years	1,200	40	1.0	7	2,000	0.6	35	0.9	6
4–6 years	1,600	50	1.0	8	2,500	0.8	50	1.2	8
7–9 years	2,000	60	1.0	10	3,500	1.0	60	1.5	10
10–12 years	2,500	70	1.2	12	4,500	1.2	75	1.8	12
BOYS									
13–15 years	3,200	85	1.4	15	5,000	1.6	90	2.4	16
16–20 years	3,800	100	1.4	15	6,000	2.0	100	3.0	20
GIRLS									
13–15 years	2,800	80	1.3	15	5,000	1.4	80	2.0	14
16–20 years	2,400	75	1.0	15	5,000	1.2	80	1.8	12
MEN (21 YEARS AND OVER)									
Moderately active (*a*)	3,000	70	.8	12	5,000	1.8	75	2.7	18
WOMEN (21 YEARS AND OVER)									
Moderately active (*a*)	2,500	60	.8	12	5,000	1.5	70	2.2	15
Pregnant	2,500	85	1.5	15	6,000	1.8	100	2.5	18
Lactating	3,000	100	2.0	15	8,000	2.3	150	3.0	23
Weighted recommended allowance *per capita* daily, calculated by application of population statistics to the above table (*b*)									
U.S.A. (*i*) Avge. (full) intake requirement ...	2,531	65.2	0.94	11.7	4,560	1.45	70.7	2.1	14.5
(*ii*) Avge. (restricted) intake requirement	2,531	65.2	0.79	9.6	3,650	1.2	58.0	1.7	11.0
Canada (*i*) Avge. (full) intake requirement ...	2,544	66.1	0.96	11.8	4,590	1.45	71.3	2.1	14.5
(*ii*) Avge. (restricted) intake requirement	2,544	66.1	0.85	9.6	3,750	1.17	59.1	1.7	11.7
U.K. (*i*) Avge. (full) intake requirement ...	2,546	64.6	0.91	11.7	4,664	1.47	71.0	2.2	14.7
(*ii*) Avge. (restricted) intake requirement	2,546	64.6	0.75	9.3	3,660	1.1	57.0	1.7	11.0

(*a*) For the purpose of the present enquiry all adult men and all adult women other than expectant and nursing mothers, have been classified as moderately active (see paragraph 42).

(*b*) Allowances used : (*i*) The " Average (Full) Intake Requirements " are calculated on the allowances recommended by the National Research Council of the United States (N.R.C. Reprint and Circular Series No. 115, January, 1943, pp. 2 and 3, reproduced in Table 4 on page 32).

(*ii*) The " Average (Restricted) Intake Requirements " are the same as (*a*) except that the requirements of minerals and vitamins for adult men and for adult women other than expectant and nursing mothers have been calculated as 70 per cent. of the " Average (Full) Intake Requirements " (see paragraph 43).

NOTES ON NUTRIENT CONVERSION FACTORS

1. While there would have been obvious advantages in using in this enquiry one set of nutrient conversion factors, it was apparent at an early stage of the discussion that it would not be practicable to do so. There appeared to be no alternative to using for application to food supply data, the conversion factors officially recognised in each country. Such a procedure, which may well have to be followed when it comes to making other comparisons of the food position in different countries, is not likely to give rise to misleading conclusions if those concerned appreciate fully the significance and the limitations of the figures they are using.

2. In the United States the conversion factors in common use are those put forward by the Bureau of Human Nutrition and Home Economics, United States Department of Agriculture (Tables of Food Composition giving Proximate Mineral and Vitamin Components of Foods, Washington, D.C., March 1, 1943, Restricted Circulation). In the United Kingdom the official data are the provisional Tables of Food Composition issued by the Accessory Food Factors Committee and the Sub-Committee on Food Composition of the Medical Research Council; these tables came into use early in 1943. The Canadian Tables are derived almost entirely from the Tables of Food Composition of the United States National Research Council as revised to November 1, 1943 (which are very similar to the tables of the Bureau of Home Economics mentioned above), changed in certain particulars by the insertion of Canadian analyses which seemed to be characteristically different; these analyses are for (*a*) the fat content of milk (3.5%), (*b*) vitamin A in butter, (*c*) the figures for flour, (*d*) ascorbic acid values. Formal agreement has recently been reached between the Food and Nutrition Board of the United States National Research Council and the Canadian Council on Nutrition that they shall jointly produce one agreed set of Tables for use in both countries.

General Character of Data

3. Allowances have been made for the inedible portion discarded in preparation. No allowance has been made for vitamin losses in household storage and in cooking or for the non-availability of some of the nutrients in certain foods.

Protein

4. With one exception—that of meats in the United Kingdom—protein values have been derived from nitrogen data by the use of appropriate conversion factors. The factor generally used was 6.25, but for milk and dairy products 6.38 and for cereals 5.7 have been employed.

The United Kingdom protein values for meat were based on the weight of fat-free, dry material in the edible portion multiplied by 0.9 This simple procedure has been found to give results in good agreement with the figures based on nitrogen determinations.

Fat

5. The figures for the United States and Canada are based on methods involving extraction of the fat with a suitable solvent, usually ethyl ether. While this method undoubtedly gives trustworthy results with the majority of foods, some of the United Kingdom experts are inclined to think that it may give low values, due to incomplete extraction, when applied to cereals, pulses and certain other materials. For this reason they have preferred to rely on a method based on the Liebermann-Szekeley saponification procedure, although some of the figures used in the United Kingdom are derived from solvent extraction analyses. Careful comparison of the data did not, however,

indicate that the small differences noted between the fat contents of certain foods were of any practical significance in the enquiry being undertaken although it was noted that the United Kingdom tables list potatoes, pulses, fruits and vegetables as containing traces of fat, while the United States and Canadian tables list actual figures. Both the United States and Canadian nutrient supplies are thus credited with a very small amount of fat that would not be accounted for in the United Kingdom figures.

Carbohydrate

6. There are two important differences between the data for carbohydrate recorded in the United States and Canadian tables on the one hand and the United Kingdom tables on the other. In the former, the figures refer to total carbohydrate obtained " by difference " whereas the United Kingdom Medical Research Council values represent " available carbohydrate " and in practically all cases are derived from actual determinations of starch, dextrins and sugar. The second difference is that the United States and Canadian values are recorded as " carbohydrate " irrespective of kind while those in the United Kingdom tables are calculated as starch. These differences are responsible for a number of discrepancies most of which are naturally reflected in the calorie values of the foods concerned and which result in an over-valuation of the United States and Canadian nutrient supplies in relation to those of the United Kingdom.

An attempt was made to reconcile those divergencies by applying the United Kingdom procedure to the United States data where the discrepancies appeared significant and where a reliable basis could be found either in United Kingdom or United States data for calculating the " available carbohydrates " of the United States foods. It was noted, however, that the differences involved were scattered among some 50 different commodities, for many of which no reliable data were available for making the calculations in question. Thus the attempt was abandoned.

Estimates have been made, however, for the different food groups of the percentage of total carbohydrates which might be unavailable, both in United States and Canadian data. Calculation on the basis of starch has also been done to note the differences here involved. It appears that these two differences in method may result in an over-valuation of the United States data relating to the United Kingdom basis by approximately 150 calories. The similar correction for Canada amounts to about 100 calories. These corrections are shown in the tables by bracketed figures for the calorie and carbohydrate equivalents for the total diet, but not for the individual food groups.

It was agreed that the determination of " total carbohydrates by difference" is the less satisfactory method and that in the interests of accuracy, as well as uniformity for comparative purposes, it is preferable to express the carbohydrate content of foods as the fractions actually available to the body. This matter becomes of increasing importance as foods of plant origin and less refined products make up a larger proportion of the diet.

It was also agreed that in adopting the above procedure, it would seem advisable to reduce the carbohydrates to a common basis, such as starch or its equivalent, in applying the factor in computing calories.

Calories

7. It was agreed to use 4.9.4 as the calorie conversion factors for protein, fat and carbohydrate, respectively.

Calcium and iron

8. Points for discussion did not arise.

Vitamins

9. It was agreed that the food supplies of the three countries should be assessed in terms of vitamins A, B_1 (aneurin, thiamin) and C (ascorbic acid) by using the conversion factors set out in the respective official tables. It was clearly impracticable having regard to the wide variation in the vitamin content of foods and the different character of many of the foods eaten in North America and Great Britain, to use one set of figures, except as a matter of expediency in the case of riboflavin and niacin for which the United Kingdom tables do not give values and it was therefore agreed to use those in the United States tables.

Vitamin A

10. Some of the most arresting discrepancies among the figures in the three sets of conversion factors were found in the analyses for Vitamin A content. There are several reasons for this. In the first place individual foods, e.g., liver and carrots, show a surprisingly wide range of variation in the amounts of vitamin A or the provitamin A (carotene) they contain. It is, therefore, a matter of difficulty and one necessarily involving a considerable margin of error to choose a value to represent each food, although this has to be done in a statistical examination, such as forms an integral part of a consumption enquiry. A second cause of conflicting values may be traced in the experimental difficulties encountered in estimating vitamin A and carotene, whether by a biological assay method or by chemical means. Then there is the disturbing problem, a solution of which seems to be as remote as ever, as to the equivalence that should be given to carotene when expressed as vitamin A. Lacking information of a reliable character as to the absorption of carotene from food in the human digestive tract (it is known that striking differences exist, e.g., between the absorption of carotene in butter and carotene in carrots), and how effectively carotene absorbed by the human digestive tract is converted in the body into vitamin A, we have little more to go on than a few observations on animals.

In 1934 a Conference in London established an International Unit of vitamin A as the activity of 0.6 micrograms of standard beta carotene. After careful consideration of recent evidence, the Accessory Food Factors Committee of the United Kingdom Medical Research Council came to the decision that in order to evaluate carotene of plant tissues in international units of vitamin A, the assumption should be made that 1 unit is equivalent to 1.8 micrograms of beta carotene instead of 0.6 micrograms.

On the other hand, the United States and Canadian conversion factors are based on the relationship of values directly determined by biological assay; or computed by dividing micrograms of vitamin A *per se* by 0.3, beta carotene by 0.6 or alpha carotene by 1.2 and adding to get the total vitamin A value for the food. Apart altogether, therefore, from differences in the representative vitamin A value of a plant food as grown in the two countries there is the complication that the United States and Canadian figures show values markedly greater than would be given by the United Kingdom procedure.

In the present state of our knowledge there is nothing that usefully can be done to bridge the gap. In Table 2 on page 16 of the report it will be seen how these tiresome, but as yet unavoidable, differences can distort statistical treatments of food supply. All that could be done with the data in this case was to recalculate the United Kingdom food supplies on the basis of the United States vitamin A values. These rough and ready check values are given in brackets in Table 2, although they are not regarded with any confidence.

It was not thought necessary in considering the vitamin A or carotene values of foods " as purchased " or " edible portion " to make any allowance for losses during storage or in cooking. None of the tables takes these into account.

It is recognised that it may be desirable in the future to separate the real vitamin A which is found in animal sources from the vitamin A calculated by means of factors from the carotene content of plant products.

Vitamin B_1 (Aneurin or Thiamin)

11. A comparison of the United Kingdom and United States or Canadian conversion factors for this nutrient, reveals discrepancies in the case of several foods, explainable on the basis of differences in assay procedures. These discrepancies are of practical importance for the present comparison only in the case of the meat group which furnishes, for example, over a third of the United States calculated supply. Here the United States figures for thiamin content are from 1.5 to five times the United Kingdom values for the same products. Thus to provide a better basis for comparing the thiamin supplies of the two countries, the United Kingdom data were recalculated using the United States factors, with certain adjustments for differences in composition of the products, giving an increase of 0.2 mgm. per head per day over the value of 1943 calculated by the United Kingdom factors. This figure was added to the previously estimated daily supply to provide the data for this nutrient which are included in brackets in Table 2.

Vitamin C (Ascorbic Acid)

12. The values for vitamin C are, for the most part, trustworthy. There is, however, a considerable margin of error inherent in the statistical estimation of vegetable supplies. This vitamin is particularly subject to losses in storage and cooking.

Riboflavin and Niacin (Nicotinic Acid)

13. Methods for the estimation of these two nutrients are not yet as satisfactorily developed as are those for thiamin and ascorbic acid. The figures in the tables for the amounts of these two substances in foods are, therefore, regarded with less confidence than those for most of the other nutrients.

NUTRIENTS AVAILABLE FOR CIVILIAN CONSUMPTION PER HEAD PER DAY UNITED STATES

APPENDIX V, TABLES 1 & 2
(Ref. U.S.A./F/Pre.)

1935–39

	Calories	Protein (gm.)	Fat (gm.)	Carbohydrates (gm.)	Calcium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thiamin (mgm.)	Riboflavin (mgm.)	Niacin (mgm.)
1. Milk and milk products	388	19.6	21.9	27.6	653	1.1	1,109	6.5	.15	.91	.5
2. Meats	414	20.5	36.8	.3	12	3.3	720	.8	.78	.36	9.0
3. Poultry, game and fish	52	5.9	3.1	.1	5	.5	10	.6	.03	.02	1.6
4. Eggs (fresh equivalent)	62	5.0	4.5	.3	21	1.1	394	0	.08	.20	†
5. Fats and oils	498	0	55.0	.1	3	0	688	0	0	0	0
6. Sugar and syrups	480	0	0	119.6	5	.1	0	0	‡	‡	0
7. Potatoes	136	2.9	.3	30.1	24	1.1	845	18.3	.13	.08	1.8
8. Dry beans, peas, soybeans and nuts	94	4.7	4.1	9.6	23	1.4	5	0	.13	.06	1.1
9. Tomatoes and citrus	30	.7	.2	6.6	17	.4	497	25.4	.06	.03	.4
10. Other fruits	104	.9	.5	24.1	16	.7	683	10.9	.05	.08	.6
11. Leafy, green and yellow vegetables	28	.5	.2	5.3	29	.7	1,484	29.8	.07	.06	.4
12. Other vegetables	30	.9	.2	6.0	15	.3	35	6.5	.06	.04	.1
13. Grain	889	25.9	3.0	189.0	41	2.9	16	0	.27	.12	2.2
14. Miscellaneous	23	.2	2.1	.8	4	.3	0	0	3‡	0	0
TOTAL FROM ALL SOURCES	3,228	88.7	131.9	419.5	868	13.9	6,486	98.8	1.78	1.96	17.7

1940

	Calories	Protein (gm.)	Fat (gm.)	Carbohydrates (gm.)	Calcium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thiamin (mgm.)	Riboflavin (mgm.)	Niacin (mgm.)
1. Milk and milk products	393	20.4	22.4	26.9	683	1.2	1,140	7.0	.15	.94	.5
2. Meats	310	22.7	43.3	.4	12	3.4	820	.9	.85	.38	9.6
3. Poultry, game and fish	56	6.1	3.4	.1	5	.5	10	.7	.03	.03	1.7
4. Eggs (fresh equivalent)	66	5.4	4.8	.3	23	1.1	420	0	.09	.21	†
5. Fats and oils	702	.1	58.5	.1	4	.3	720	0	.08	.02	.5
6. Sugar and syrups	491	0	0	122.6	8	.2	0	0	‡	‡	0
7. Potato	132	2.9	.3	29.2	22	1.1	658	17.1	.13	.07	1.7
8. Dry beans, peas, soybeans and nuts	86	4.4	3.6	9.0	22	1.3	§	0	.11	.06	1.1
9. Tomatoes and citrus	35	.8	.2	7.6	20	.4	522	28.2	.07	.03	.5
10. Other fruits	107	.9	.4	28.0	18	.8	680	11.3	.05	.09	.6
11. Leafy, green and yellow vegetables	36	1.9	.2	6.8	34	.9	1,754	31.8	.09	.07	.5
12. Other vegetables	29	.9	.2	5.8	15	.3	31	6.6	.03	.04	.1
13. Grains	890	25.7	2.6	190.1	41	2.9	30	0	.25	.12	2.2
14. Miscellaneous	24	.3	2.2	.9	3	.1	0	0	‡	0	0
TOTAL FROM ALL SOURCES	3,357	92.5	142.1	427.8	910	14.5	6,785	103.6	1.93	2.06	19.0

† Less than 0.05 milligrams. ‡ Less than 0.005 milligrams. § Less than 5 International Units.

NUTRIENTS AVAILABLE FOR CIVILIAN CONSUMPTION PER HEAD PER DAY UNITED STATES

APPENDIX V, TABLES 3 & 4
(Ref. U.S.A./F/41)

1941

		Calories	Protein (gm.)	Fat (gm.)	Carbo-hydrates (gm.)	Cal-cium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thia-min (mgm.)	Ribo-flavin (mgm.)	Nia-cin (mgm.)
1.	Milk and milk products	403	21.1	23.0	27.7	704	1.2	1,160	7.3	.16	.98	.6
2.	Meats	309	23.0	42.8	.4	12	3.5	790	.9	.81	.38	9.6
3.	Poultry, game and fish	59	6.3	3.6	.4	5	.5	10	.7	.03	.03	1.7
4.	Eggs (fresh equivalent)	65	5.3	4.7	.3	22	1.1	410	0	.08	.21	†
5.	Fats and oils	705	.1	60.3	.1	4	.3	720	0	.08	.02	.4
6.	Sugars and syrups	561	0	0	140.3	8	.2	0	0	‡	‡	0
7.	Potatoes	131	2.9	.3	28.9	22	1.0	758	17.3	.13	.07	1.7
8.	Dry beans, peas, soybeans and nuts	85	4.4	3.4	9.2	22	1.3	§	0	.12	.06	1.1
9.	Tomatoes and citrus	37	.8	.2	8.1	20	.4	564	29.7	.08	.03	.5
10.	Other fruits	112	.9	.4	29.3	19	.8	795	11.9	.05	.08	.6
11.	Leafy, green and yellow vegetables	30	1.7	.2	5.7	31	.7	1,561	29.5	.07	.06	.5
12.	Other vegetables	38	1.1	.3	7.7	17	.3	71	7.2	.03	.04	.2
13.	Grains	904	26.1	2.7	193.2	42	3.1	30	0	.25	.13	2.2
14.	Miscellaneous	23	.3	2.0	.9	3	.1	0	0	‡	0	0
	TOTAL FROM ALL SOURCES	3,462	94.0	143.9	452.2	931	14.5	6,869	104.5	1.89	2.09	19.1

1942

		Calories	Protein (gm.)	Fat (gm.)	Carbo-hydrates (gm.)	Cal-cium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thia-min (mgm.)	Ribo-flavin (mgm.)	Nia-cin (mgm.)
1.	Milk and milk products	430	22.4	24.6	29.5	747	1.3	1,240	7.9	.17	1.04	.6
2.	Meats	299	22.5	42.2	.3	12	3.5	790	.9	.75	.37	9.3
3.	Poultry, game and fish	59	6.3	3.7	.1	5	.6	10	.8	.03	.03	1.8
4.	Eggs (fresh equivalent)	66	5.4	4.8	.3	23	1.1	420	0	.09	.21	†
5.	Fats and oils	673	0	55.4	.1	4	.2	720	0	.07	.02	.4
6.	Sugars and syrups	515	0	0	128.8	11	.2	0	0	‡	‡	0
7.	Potatoes	129	2.9	.3	28.6	22	1.0	772	17.1	.13	.07	1.6
8.	Dry beans, peas, soybeans and nuts	85	4.3	3.6	8.7	21	1.3	§	0	.12	.06	1.1
9.	Tomatoes and citrus	35	.8	.2	7.5	19	.4	584	28.5	.07	.03	.5
10.	Other fruits	93	.8	.4	23.8	17	.6	660	10.4	.05	.07	.5
11.	Leafy, green and yellow vegetables	32	1.7	.2	6.0	33	.8	1,703	31.6	.08	.06	.5
12.	Other vegetables	35	1.1	.2	7.0	17	.3	41	7.3	.03	.05	.2
13.	Grains	924	26.7	2.8	197.8	43	3.3	30	0	.43	.13	2.6
14.	Miscellaneous	17	.2	1.5	1.6	2	.1	0	0	‡	0	0
	TOTAL FROM ALL SOURCES	3,392	95.1	139.9	440.1	976	14.7	6,970	104.5	2.02	2.14	19.1

† Less than 0.05 milligrams. ‡ Less than 0.005 milligrams. § Less than 5 International Units.

NUTRIENTS AVAILABLE FOR CIVILIAN CONSUMPTION PER HEAD PER DAY UNITED STATES

APPENDIX V, TABLES 5 & 6
(Ref. U.S.A./F/43)

1943

	Calories	Protein (gm.)	Fat (gm.)	Carbo-hydrates (gm.)	Cal-cium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thia-min (mgm.)	Ribo-flavin (mgm.)	Nia-cin (mgm.)
1. Milk and milk products	453	23.0	25.2	33.4	762	1.3	1,272	8.0	.18	1.08	.6
2. Meats	464	20.2	41.9	.4	12	3.5	969	1.0	.83	.40	9.5
3. Poultry, game and fish	62	6.6	3.8	.1	6	.6	7	1.0	.03	.02	2.0
4. Eggs (fresh equivalent)	74	6.0	5.4	.3	25	1.3	468	0	.10	.23	†
5. Fats and oils	470	0	52.1	.1	2	0	640	0	0	0	0
6. Sugars and syrups	425	0	0	106.3	11	.2	0	0	‡	‡	0
7. Potatoes	148	3.2	.3	32.8	26	1.2	887	20.2	.18	.10	1.9
8. Dry beans, peas, soybeans and nuts	94	5.1	3.5	10.4	26	1.6	4	0	.13	.07	1.1
9. Tomatoes and citrus	34	.8	.2	7.2	19	.4	582	29.1	.07	.03	.4
10. Other fruits	73	.6	.4	16.7	13	.5	452	8.4	.04	.06	.4
11. Leafy, green and yellow vegetables	33	1.8	.2	5.9	33	.8	1,586	30.9	.08	.06	.4
12. Other vegetables	35	1.1	.2	6.9	16	.3	92	6.9	.07	.05	.2
13. Grains	898	26.1	3.0	191.6	42	4.0	20	0	.72	.21	3.7
14. Miscellaneous	20	.2	1.8	.8	3	.1	0	0	‡	0	0
TOTAL FROM ALL SOURCES	3,283	94.7	138.0	412.9	996	15.8	6,979	105.5	2.43	2.31	20.2

1943-1944

	Calories	Protein (gm.)	Fat (gm.)	Carbo-hydrates (gm.)	Cal-cium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thia-min (mgm.)	Ribo-flavin (mgm.)	Nia-cin (mgm.)
1. Milk and milk products	410	21.7	23.1	29.2	725	1.2	1,150	8.4	.17	1.03	.6
2. Meats	270	20.8	44.3	.4	11	3.2	1,000	1.0	.70	.37	8.7
3. Poultry, game and fish	62	6.9	3.7	.1	6	.6	10	.9	.03	.02	2.0
4. Eggs (fresh equivalent)	70	5.6	4.9	.3	24	1.2	440	0	.09	.22	†
5. Fats and oils	680	.1	51.1	.1	4	.3	640	0	.11	.03	.6
6. Sugars and syrups	440	.02	0	109.0	20	.4	0	.3	‡	‡	0
7. Potatoes	145	4.1	*	31.5	25	1.1	821	18.6	.18	.10	1.9
8. Dry beans, peas, soybeans and nuts	110	6.6	4	11.5	34	2.2	10	0	.16	.09	1.5
9. Tomatoes and citrus	41	.7	*	8.5	21	.4	575	33.0	.08	.03	.5
10. Other fruits	63	.6	*	18.1	12	.5	444	7.0	.04	.05	.4
11. Leafy, green and yellow vegetables	36	1.8	*	6.3	33	.8	1,596	38.0	.08	.06	.4
12. Other vegetables	34	1.0	*	6.5	15	.3	73	7.0	.07	.05	.2
13. Grains	890	26.2	3	192.0	42	5.3	10	0	.77	.37	5.2
14. Miscellaneous	20	.2	2	.7	3	.1	0	0	‡	0	0
TOTAL FROM ALL SOURCES	3,271	96.3	138	414.2	975	17.6	6,769	114.2	2.48	2.42	22.0

* Less than 0.5 grams. † Less than 0.05 milligrams. ‡ Less than 0.005 milligrams.

NUTRIENTS AVAILABLE FOR CIVILIAN CONSUMPTION PER HEAD PER DAY CANADA

Appendix V, Tables 7 & 8
(Ref. Can./F/Pre.)

1935–39

	Calories	Protein (gm.)	Fat (gm.)	Carbo-hydrates (gm.)	Cal-cium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thia-min (mgm.)	Ribo-flavin (mgm.)	Nia-cin (mgm.)
1. Dairy products	361	18.8	20.6	25.0	630	1.1	1,236	8.8	.15	.89	.5
2. Meats	404	19.7	36.0	.2	13	3.6	525	1.3	.86	.36	8.3
3. Poultry, game and fish	57	6.3	3.5	—	6	.6	22	.6	.03	.05	1.6
4. Eggs	53	4.3	3.8	.2	18	.9	335	0	.07	.12	—
5. Fats and oils	463	.3	51.2	.2	6	.1	574	0	—	—	—
6. Sugars and syrups	480	—	0	120.0	18	.5	0	0	—	.01	0
7. Potatoes	172	4.2	.3	38.4	16	1.5	103	20.1	.18	.10	2.4
8. Dried pulses and nuts	66	3.6	2.2	8.0	15	1.1	4	0	.11	.05	.6
9. Tomatoes and citrus fruit	16	.4	.1	3.4	10	.2	231	9.9	.04	.02	.2
10. Other fruits	64	.5	.3	15.0	10	.5	196	3.6	.03	.04	.3
11. Leafy, green and yellow vegetables	17	.8	.1	3.4	17	.5	2,876	8.2	.04	.04	.4
12. Other vegetables	17	.5	.1	3.6	10	.2	29	5.2	.01	.02	.1
13. Grain products	938	28.9	2.9	199.1	59	4.1	2	0	.41	.15	2.8
14. Miscellaneous	16	.2	1.4	.5	2	—	0	0	—	0	0
TOTAL FROM ALL SOURCES	3,124	88.5	122.5	417.0	830	14.9	6,133	57.7	1.93	1.85	17.2

1940

	Calories	Protein (gm.)	Fat (gm.)	Carbo-hydrates (gm.)	Cal-cium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thia-min (mgm.)	Ribo-flavin (mgm.)	Nia-cin (mgm.)
1. Dairy products	375	19.6	21.3	26.2	658	1.1	1,276	9.0	.16	.94	.6
2. Meats	410	19.7	36.7	.2	13	3.6	488	1.2	.89	.36	8.4
3. Poultry, game and fish (*a*)	61	6.7	3.8	—	6	.6	22	.7	.04	.05	1.8
4. Eggs	52	4.3	3.8	.2	18	.9	332	0	.07	.12	—
5. Fats and oils	460	.3	51.0	.2	6	.1	573	0	—	—	.1
6. Sugars and syrups	503	—	0	125.7	19	.5	0	0	—	.01	0
7. Potatoes	181	4.4	.3	40.4	17	1.5	107	21.1	.19	.11	2.5
8. Dried pulses and nuts	68	3.6	2.5	7.7	16	1.1	4	0	.11	.05	.7
9. Tomatoes and citrus fruit	19	.6	.1	4.0	12	.3	309	9.7	.04	.02	.2
10. Other fruits	70	.5	.3	16.3	11	.6	217	4.2	.03	.04	.4
11. Leafy, green and yellow vegetables	17	.8	.1	3.2	15	.5	2,799	7.8	.04	.03	.4
12. Other vegetables	16	.5	.1	3.2	9	.2	24	4.8	.01	.02	.1
13. Grain products	787	24.4	2.4	167.1	50	3.4	1	0	.34	.12	2.3
14. Miscellaneous	26	.3	2.4	.9	3	.1	0	0	—	0	0
TOTAL FROM ALL SOURCES	3,045	85.7	124.8	395.3	853	14.5	6,152	58.5	1.92	1.87	17.5

(*a*) Fish statistics for 1935–39 used as estimate for 1940 in absence of figures for latter year.
NOTE: (—) has been used in these tables to indicate negligible amounts.

NUTRIENTS AVAILABLE FOR CIVILIAN CONSUMPTION PER HEAD PER DAY UNITED STATES

Appendix V, Tables 9 & 10

NUTRIENTS AVAILABLE FOR CIVILIAN CONSUMPTION PER HEAD PER DAY UNITED STATES

1941

	Calories	Protein (gm.)	Fat (gm.)	Carbo-hydrates (gm.)	Cal-cium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thia-min (mgm.)	Ribo-flavin (mgm.)	Nia-cin (mgm.)
1. Dairy products	381	20.0	21.8	26.4	673	1.1	1,299	9.1	.16	.95	.6
2. Meats	420	20.4	37.4	.2	13	3.7	543	1.4	.90	.37	8.7
3. Poultry, game and fish	55	5.8	3.5	—	6	.6	16	.6	.03	.04	1.6
4. Eggs	53	4.3	3.8	.2	18	.9	336	0	.07	.12	—
5. Fats and oils	497	.3	55.0	.2	6	.1	572	0	—	—	.1
6. Sugars and syrups	524	—	0	131.0	18	.5	0	0	—	.01	0
7. Potatoes	181	4.4	.3	40.5	17	1.5	107	21.1	.19	.11	2.5
8. Dried pulses and nuts	65	3.5	2.4	7.5	15	1.0	3	0	.11	.05	.7
9. Tomatoes and citrus fruit	19	.5	.1	4.1	11	.2	235	11.8	.04	.02	.3
10. Other fruits	74	.6	.4	17.3	12	.6	239	5.2	.03	.05	.4
11. Leafy, green and yellow vegetables	17	.9	.1	3.3	15	.5	2,405	8.4	.04	.04	.4
12. Other vegetables	15	.4	.1	3.0	7	.2	26	4.1	.01	.02	.1
13. Grain products	819	25.3	2.6	173.6	53	3.7	1	0	.37	.13	2.4
14. Miscellaneous	29	.3	2.7	1.0	3	.1	0	0	—	0	0
TOTAL FROM ALL SOURCES	3,149	86.7	130.2	408.3	867	14.7	5,782	61.7	1.95	1.91	17.8

1942

	Calories	Protein (gm.)	Fat (gm.)	Carbo-hydrates (gm.)	Cal-cium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thia-min (mgm.)	Ribo-flavin (mgm.)	Nia-cin (mgm.)
1. Dairy products	405	21.2	22.9	28.5	711	1.2	1,370	9.7	.17	1.02	.6
2. Meats	435	21.0	38.9	.2	14	3.8	552	1.4	.93	.38	8.9
3. Poultry, game and fish	66	6.8	4.3	—	6	.7	18	.8	.04	.05	1.9
4. Eggs	56	4.6	4.0	.3	19	1.0	349	0	.07	.13	—
5. Fats and oils	524	.3	58.0	.2	7	.1	617	0	—	—	.1
6. Sugars and syrups	419	—	0	104.8	19	.5	0	0	—	.01	0
7. Potatoes	183	4.5	.3	40.9	17	1.6	112	21.4	.19	.11	2.5
8. Dried pulses and nuts	65	3.8	1.2	9.6	20	1.5	3	0	.11	.06	.5
9. Tomatoes and citrus fruit	20	.5	.1	4.4	13	.3	241	11.7	.05	.02	.2
10. Other fruits	56	.4	.3	13.2	9	.5	189	3.4	.02	.03	.3
11. Leafy, green and yellow vegetables	25	1.2	.2	4.8	22	.7	4,207	11.8	.05	.05	.6
12. Other vegetables	21	.6	.1	4.4	12	.3	34	6.3	.02	.03	.1
13. Grain products	882	27.4	2.7	187.2	56	3.9	1	0	.38	.14	2.6
14. Miscellaneous	21	.2	1.9	.7	3	.1	0	0	—	0	0
TOTAL FROM ALL SOURCES	3,178	92.5	134.9	399.2	928	16.2	7,693	66.5	2.03	2.03	18.3

NOTE: (—) has been used in these tables to indicate negligible amounts.

NUTRIENTS AVAILABLE FOR CIVILIAN CONSUMPTION PER HEAD PER DAY CANADA
1943

	Calories	Protein (gm.)	Fat (gm.)	Carbo-hydrates (gm.)	Cal-cium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thia-min (mgm.)	Ribo-flavin (mgm.)	Nia-cin (mgm.)
1. Dairy products	425	22.1	24.2	29.6	743	1.3	1,445	10.2	.18	1.07	.6
2. Meats	447	22.5	39.5	.2	15	4.1	632	1.6	.89	.41	9.2
3. Poultry, game and fish	64	6.6	4.1	—	6	.7	18	.8	.04	.05	1.8
4. Eggs	66	5.4	4.8	.3	23	1.1	416	0	.09	.15	—
5. Fats and oils	489	.2	54.1	.2	6	.1	552	0	—	—	.1
6. Sugars and syrups	392	—	0	98.0	19	.5	0	0	—	.01	0
7. Potatoes	184	4.5	.3	41.1	17	1.6	100	21.4	.19	.11	2.5
8. Dried pulses and nuts	55	3.3	.9	8.3	16	1.2	2	0	.10	.05	.5
9. Tomatoes and citrus fruit	20	.5	.1	4.3	13	.2	201	11.2	.04	.01	.2
10. Other fruits	57	.4	.3	13.4	9	.5	167	3.4	.02	.03	.3
11. Leafy, green and yellow vegetables	17	.8	.1	3.4	16	.5	3,220	7.7	.04	.03	.5
12. Other vegetables	17	.5	.1	3.5	9	.2	29	4.9	.01	.02	.1
13. Grain products	971	30.2	3.0	206.0	62	4.3	1	0	.42	.15	2.8
14. Miscellaneous	19	.2	1.7	.6	2	.1	0	0	—	0	0
TOTAL FROM ALL SOURCES	3,223	97.2	133.2	408.9	956	16.4	6,783	61.2	2.02	2.09	18.6

NOTE: (—) has been used in these tables to indicate negligible amounts.

NUTRIENTS AVAILABLE FOR CIVILIAN CONSUMPTION PER HEAD PER DAY UNITED KINGDOM

APPENDIX V, TABLES 12 & 13
(Ref. U.K./F/Pre.)

1934-38

	Calories	Protein (gm.)	Fat (gm.)	Carbo-hydrates (gm.)	Cal-cium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thia-min (mgm.)	Ribo-flavin (mgm.)	Nia-cin (mgm.)
1. Dairy products	272	13.8	15.3	19.6	481	0.4	530	4.5	.15	.62	.4
2. Meats	498	18.9	46.9	.2	10	4.1	574	—	.33	.40	10.2
3. Poultry, game and fish	42	6.8	1.7	—	16	.6	11	—	.02	.02	1.2
4. Eggs and egg products	39	3.5	2.8	.1	16	.8	105	—	.04	.13	—
5. Fats and oils	510	.2	56.6	—	5	.1	1,386	—	—	—	—
6. Sugars and syrups	451	—	—	112.3	2	—	—	—	—	—	—
7. Potatoes	123	3.6	—	27.1	14	1.3	—	24.7	.21	.09	2.2
8. Dried pulses and nuts	40	2.7	1.3	4.3	10	.6	2	—	.06	.04	.5
9. Tomatoes and citrus fruits	12	.4	—	2.7	13	.1	192	19.5	.02	.01	.2
10. Other fruits	51	.5	—	12.2	15	.5	34	8.8	.03	.06	.3
11. Leafy, green and yellow vegetables	15	1.9	—	1.8	46	.7	1,033	47.7	.10	.07	.6
12. Other vegetables	10	.5	—	1.9	19	.2	—	6.8	.02	.03	.1
13. Grain products	899	28.1	3.0	189.9	46	3.0	—	—	.22	.11	2.3
14. Miscellaneous	22	.5	1.9	.7	1	.4	1	—	—	—	—
TOTAL FROM ALL SOURCES	2,984	81.4	129.5	372.8	694	12.8	3,868	112.0	1.20	1.58	18.0

1940

	Calories	Protein (gm.)	Fat (gm.)	Carbo-hydrates (gm.)	Cal-cium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thia-min (mgm.)	Ribo-flavin (mgm.)	Nia-cin (mgm.)
1. Dairy products	254	13.6	14.7	17.3	478	.4	507	4.7	.15	.62	.4
2. Meats	435	16.3	41.1	.2	8	3.5	603	—	.27	.37	8.7
3. Poultry, game and fish	34	5.2	1.6	—	14	.5	10	—	.01	.02	1.1
4. Eggs and egg products	36	3.2	2.5	.1	14	.7	98	—	.03	.12	—
5. Fats and oils	457	.1	50.7	—	3	.1	935	—	—	—	—
6. Sugars and syrups	333	—	—	83.1	2	—	—	—	—	—	—
7. Potatoes	127	3.6	—	28.0	14	1.3	—	25.0	.21	.09	2.2
8. Dried pulses and nuts	30	2.0	1.3	2.7	7	.4	2	—	.05	.03	.4
9. Tomatoes and citrus fruit	10	.3	—	2.4	10	.1	126	15.4	.02	.01	.2
10. Other fruits	42	.4	—	10.1	13	.4	24	6.3	.02	.04	.2
11. Leafy, green and yellow vegetables	16	1.9	—	1.9	45	.7	1,014	49.1	.10	.06	.5
12. Other vegetables	10	.4	—	1.9	17	.1	—	6.2	.02	.03	.1
13. Grains	955	31.8	3.7	198.5	49	4.0	—	—	.42	.20	3.6
14. Miscellaneous	33	.8	2.9	1.1	1	.6	1	—	—	—	—
TOTAL FROM ALL SOURCES	2,772	79.6	118.5	347.3	675	12.8	3,320	106.7	1.30	1.59	17.4

NUTRIENTS AVAILABLE FOR CIVILIAN CONSUMPTION PER HEAD PER DAY UNITED KINGDOM

Appendix V, Tables 14 & 15
(Ref. U.K./F/41)

1941

	Calories	Protein (gm.)	Fat (gm.)	Carbo-hydrates (gm.)	Cal-cium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thia-min (mgm.)	Ribo-flavin (mgm.)	Nia-cin (mgm.)
1. Dairy products	262	14.4	15.8	15.8	506	.5	540	5.1	.16	.66	.4
2. Meats	375	14.3	35.3	.2	8	3.2	518	—	.24	.31	7.6
3. Poultry, game and fish	29	4.6	1.3	—	11	.4	8	—	.01	.02	.9
4. Eggs and egg products	30	2.7	2.1	.1	12	.6	80	—	.03	.10	—
5. Fats and oils	447	.1	49.6	—	3	.1	817	—	—	—	—
6. Sugars and syrups	298	—	—	74.5	1	—	—	—	—	—	—
7. Potatoes	145	4.1	—	32.0	16	1.4	—	28.5	.24	.11	2.6
8. Dried pulses and nuts	26	2.1	.4	3.6	8	.5	2	—	.04	.03	.3
9. Tomatoes and citrus fruit	3	.1	—	.6	3	—	119	5.3	.01	—	.1
10. Other fruits	29	.2	—	7.0	10	.2	12	2.7	.01	.02	.1
11. Leafy, green and yellow vegetables	18	2.0	—	2.4	51	.8	1,537	52.5	.11	.07	.6
12. Other vegetables	12	.6	—	2.3	21	.2	—	7.8	.02	.03	.1
13. Grains	1,091	37.5	4.4	225.3	54	4.6	—	—	.48	.23	4.1
14. Miscellaneous	30	.7	2.6	1.0	1	.5	1	—	—	—	—
Total from all Sources	2,795	83.4	111.5	364.8	705	13.0	3,634	101.9	1.35	1.58	16.8

1942

	Calories	Protein (gm.)	Fat (gm.)	Carbo-hydrates (gm.)	Cal-cium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thia-min (mgm.)	Ribo-flavin (mgm.)	Nia-cin (mgm.)
1. Dairy products	315	17.9	19.2	18.1	621	.5	664	5.5	.18	.77	.4
2. Meats	379	15.3	35.2	.2	8	3.5	473	—	.25	.31	7.7
3. Poultry, game and fish	29	4.6	1.1	—	11	.5	8	—	.02	.02	.8
4. Eggs and egg products	31	2.8	2.2	.1	13	.6	85	—	.03	.11	—
5. Fats and oils	451	.1	50.1	—	2	.1	695	—	—	—	—
6. Sugars and syrups	310	—	—	77.4	1	—	—	—	—	—	—
7. Potatoes	176	4.9	—	38.9	19	1.7	—	34.7	.30	.13	3.1
8. Dried pulses and nuts	24	2.0	.4	3.1	8	.5	2	—	.04	.03	.3
9. Tomatoes and citrus fruit	5	.3	—	1.2	5	.1	209	7.8	.01	.01	.1
10. Other fruits	38	.3	—	9.0	13	.3	22	5.4	.01	.03	.2
11. Leafy, green and yellow vegetables	21	2.3	—	2.9	60	.9	1,698	59.5	.12	.08	.9
12. Other vegetables	14	.8	—	2.8	25	.3	—	9.4	.02	.04	.2
13. Grains	1,045	36.7	6.4	209.8	67	6.4	—	—	.79	.42	4.5
14. Miscellaneous	26	.6	2.2	.8	1	.4	1	—	—	—	—
Total from all Sources	2,864	88.6	116.8	364.3	854	15.8	3,857	122.3	1.77	1.95	18.2

NUTRIENTS AVAILABLE FOR CIVILIAN CONSUMPTION PER HEAD PER DAY UNITED KINGDOM

APPENDIX V, TABLES 16 & 17
(Ref. U.K./F/43)

1943

	Calories	Protein (gm.)	Fat (gm.)	Carbo-hydrates (gm.)	Cal-cium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thia-min (mgm.)	Ribo-flavin (mgm.)	Nia-cin (mgm.)
1. Dairy products	315	18.1	18.5	19.4	630	.6	635	5.7	.19	.81	.5
2. Meats	362	14.7	33.7	.2	8	3.3	461	—	.25	.30	.7
3. Poultry, game and fish	27	4.2	1.1	—	11	.4	8	—	.01	.01	7.4
4. Eggs and egg products	34	3.1	2.4	.1	14	.7	95	—	.02	.12	—
5. Fats and oils	429	.1	47.6	—	2	.1	683	—	—	—	—
6. Sugars and syrups	307	—	—	76.7	1	—	—	.1	—	—	—
7. Potatoes	181	5.1	—	40.1	20	1.7	—	35.8	.31	.14	3.2
8. Dried pulses and nuts	21	2.1	.3	2.4	9	.5	—	—	.04	.03	.3
9. Tomatoes and citrus fruit	5	.2	—	.9	3	.1	144	6.1	.01	.01	.1
10. Other fruits	29	.2	—	6.8	10	.2	16	4.2	.01	.03	.2
11. Leafy, green and yellow vegetables	21	2.4	—	2.8	62	.9	1,839	64.6	.14	.08	.8
12. Other vegetables	16	.8	—	3.2	29	.3	—	10.6	.02	.05	.2
13. Grains	1,056	35.5	7.1	212.5	254	7.1	—	—	.92	.48	5.2
14. Miscellaneous	24	.6	2.1	.8	1	.4	1	—	—	—	—
TOTAL FROM ALL SOURCES	2,827	87.1	122.8	365.9	1,054	16.3	3,882	127.1	1.92	2.06	18.6

1943-44

	Calories	Protein (gm.)	Fat (gm.)	Carbo-hydrates (gm.)	Cal-cium (mgm.)	Iron (mgm.)	Vitamin A (I.U.)	Ascorbic Acid (mgm.)	Thia-min (mgm.)	Ribo-flavin (mgm.)	Nia-cin (mgm.)
1. Dairy products	314	17.8	18.5	19.4	622	.5	636	5.8	.19	.80	.5
2. Meats	372	14.9	34.7	.3	8	3.3	512	—	.27	.32	7.6
3. Poultry, game and fish	28	4.3	1.1	—	11	.4	8	—	.01	.02	.8
4. Eggs and egg products	37	3.3	2.6	.1	15	.8	102	—	.02	.12	—
5. Fats and oils	425	.1	47.1	—	2	.1	671	—	—	—	—
6. Sugars and syrups	315	—	—	78.5	1	—	1	.2	—	—	—
7. Potatoes	181	5.1	—	40.1	20	1.7	—	35.8	.31	.14	3.2
8. Dried pulses and nuts	27	2.5	.9	2.2	10	.5	1	—	.05	.03	.4
9. Tomatoes and citrus fruits	5	.2	—	.9	3	.1	145	6.3	.01	.01	.1
10. Other fruits	31	.2	—	7.3	10	.3	17	3.9	.01	.02	.2
11. Leafy, green and yellow vegetables	20	2.3	—	2.8	62	.9	1,839	64.4	.13	.08	.8
12. Other vegetables	16	.8	—	3.2	29	.3	—	10.6	.02	.05	.2
13. Grains	1,063	34.2	7.1	215.6	258	7.1	—	—	.89	.49	5.2
14. Miscellaneous	20	.5	1.8	.6	1	.3	—	—	—	—	—
TOTAL FROM ALL SOURCES	2,854	86.2	113.8	371.0	1,052	16.3	3,932	127.0	1.91	2.08	19.0

LONDON

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