

FOOD  
RATIONING  
AND SUPPLY  
1943/44



LEAGUE

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and Supply  
1943/44

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II. ECONOMIC AND FINANCIAL

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## PREFACE

The primary purpose of this study is to give a picture of the amount, composition and nutritive value of the legal food rations in Europe and elsewhere towards the end of last year. Changes since then, which, for the most part are mentioned in the notes to Table I, have not been extensive, so that this picture represents approximately the situation today. Owing to the generally good harvests last year rations have been increased in most European countries in the course of the last twelve months—in certain countries quite substantially. Many governments have ceased the publication of their harvest returns, but such information as is available concerning the food supply situation in different parts of the world is given in the last chapter. Though much of this information, especially as regards Europe, consists of quite unofficial estimates, it conforms well with the known facts about food rations.

In a former publication in this series, entitled "Wartime Rationing and Consumption," a description was given of the theory and practice of rationing. Reference should be made to this publication by those who require either a further description of rationing systems or information concerning the rationing of goods other than food.

A. LOVEDAY

*Director of the Economic, Financial  
and Transit Department*

League of Nations  
March, 1944

## CHAPTER I

### FOOD RATIONING AND CONSUMPTION

THE object of this chapter is to describe the rationing systems in force in the autumn of 1943. More recent information is given for some countries, but owing to the war, information comes through irregularly and with unavoidable delays and is not always complete or trustworthy. With the progress of the war, rations have become more differentiated both by class of consumer and locality, and the difficulty of obtaining simple representative figures has therefore increased. The rationing period is now frequently changed as a means of varying rations, and such changes are not always easy to trace. The data given below have been carefully checked against available sources, but there must necessarily be a risk of error in existing conditions.

Moreover, even if the data given were in all respects correct, they relate to legal rations only, which may or may not, be available in full to the consumer. In North America, the United Kingdom, Sweden and Switzerland, and probably also as a rule in Germany, rations are honoured in full, but this is not the case in occupied areas. Animal foods, for instance, are often unobtainable in part or in whole for longer or shorter periods, and actual consumption in these countries often falls below the official rations. In some countries wages have increased less than food prices, with the result that the poor cannot afford to buy the full official rations.<sup>1</sup> Rationing is also invariably accompanied by a "black market." The extent of this market depends on a number of circumstances—the efficiency of the administration, the degree to which the governments succeed in controlling the sources of supply, monetary and fiscal policy and so on; in general, however, the lower the rations the greater is the incentive to supply and use such a market. To judge from a number of reports, it plays by no means a negligible role throughout the greater part of Europe, and in many countries a considerable portion of the national food supply would appear to

<sup>1</sup> It was officially reported from Switzerland that the lowest income groups were unable to purchase their full week's rations particularly of meat. In consequence, two alternative rationing books were introduced, one giving relatively more food coupons for cheaper foods. The lack of purchasing power, is, of course, more serious in the occupied countries where prices have gone up more than in Switzerland.

reach the consumer through this channel. In certain parts of Eastern Europe and the Balkans, however, prices of the black market are so high that they must be beyond the means of the greater part of the population. Taking all the points mentioned into consideration it is perhaps reasonable to assume that legal rations represent, in most cases, maximum rather than average consumption of the classes subject to rationing.

Experience has shown that it is difficult if not impossible to ration farmers as strictly as the non-agricultural population. In spite of requisitioning, the allotment of quotas to be produced and delivered by the farmer, special inducement payments, etc., the producers or "self-suppliers" obtain larger quantities of cereals, fats and meats, than the rest of the population and they enjoy a natural priority, as regards other products raised on the farm. In most areas farmers are living on a nutritional level, which, if not always satisfactory, is not much lower than before the war. In consequence, reductions in food supply tend to fall most heavily on the non-farming population and more especially on the working population in the industrial centres. Since the rationing data relate to this population, it is necessary to warn against confusion of rationing figures with averages of national consumption.

A further difficulty in judging the situation is caused by changes in the quality of foodstuffs. In the rationing table one pound of bread or meat is necessarily considered as the equivalent of another pound of bread or meat. This is far from always being the case. The quality of bread has been changed by greater or smaller admixtures of barley, oats, potato flour, etc., and by changes in the milling percentage of flour.<sup>1</sup> The increased milling percentage improves the nutritional qualities up to a point, but in many cases it has gone too far for both health and comfort. Likewise, in the case of meat, the proportion of bone, sinews, nerves, etc., has generally increased, and the fat content decreased. Cheese and milk have had fat content legally reduced.

<sup>1</sup> In the Netherlands, for instance, bread consisted of 12.6% potato flour, 0.4% calcium carbonate and 87% flour, of which 25% was wheat, 68% rye and 7% barley. In Germany the standard formula for bread was 75% rye and wheat flour, the rest being made up of barley and potato flour. In Belgium bread was composed of 40% wheat flour, 50% rye flour and 10% barley flour in the spring of 1943. The dough of this mixture is reported to be dark and sticky; the flour is baked in water, without admixture of yeast. (*Foreign Commerce Weekly*, May 15, 1943)



Finally, many difficulties are caused by differentiation of rations. The need for food differs with sex, age, weight, occupation, etc., and when, as on the continent of Europe, 95% or more of the foods are rationed, the rationing system must take into account the varying requirements of different consumer groups. While rationing during the last war, with some exceptions for heavy workers, was based on the principle of equality, during this war it is highly differentiated. Populations are divided into categories by sex, age, and occupation, and special regulations are frequently in force for the sick, the old, and for expectant and nursing mothers. In Sweden, for instance, official statistics show some 50 different consumer categories, and on the Continent 10 groups or more are not uncommon.<sup>1</sup>

Table I summarizes available information on food rations in different countries. For the sake of convenience the rations are throughout expressed in grammes per week,<sup>2</sup> and the foodstuffs are arranged in eleven groups; while the grouping is based on nutritional affinity, the rationing systems do not always permit the separation of the rations in the manner required for this classification. The data relate generally to the late autumn of 1943, but in some cases, particularly in Eastern and Southeastern Europe, they may relate to a somewhat earlier date. Known changes since the autumn of 1943 are given in the footnotes.

It may be convenient to consider the countries given in the table under the following groups: a) Germany, German-occupied Europe, Finland, Italy and the U.S.S.R.; b) The United Kingdom and the European neutrals; c) the rest of the world.

#### I. *Germany, German Occupied Europe and the U.S.S.R.*

Ideally it would be desirable to compare average consumption *per capita*, or per adult male. As this is not generally possible in the absence of statistics showing the number of consumers in each consumer category, attention may be turned first to the "normal consumers" who constitute the largest single category.<sup>3</sup>

*Rations of Normal Consumers*—In order to express the various rations in a single unit of measure, it is a common practice to con-

<sup>1</sup> Table I below takes into account the most important categories.

<sup>2</sup> 453.6 grammes = 1 lb.

<sup>3</sup> In Germany, for instance, in 1941 42.6% of all consumers were "normal consumers"; for the period 1939/41 corresponding figure for France was 35.5%.

TAB  
LEGAL FOOD RATIONS IN  
(Grammes per week; A)

Explanation: *r.*: rationed; *l.r.*: locally rationed;

COUNTRY	CONSUMER CATEGORY	BREAD & <sup>B</sup> FLOUR (IN TERMS OF BREAD)	CERE- ALS <sup>C</sup>	POTA- TOES
Canada	<i>All consumers</i>	Free	Free	Free
United States <sup>1</sup>	<i>All consumers</i>	Free	Free	Free
United Kingdom <sup>1</sup>	<i>Normal consumer</i>	Free	Free	Free
	Children under 6 yrs.	Free	Free	Free
	Children 6-17 yrs.	Free	Free	Free
Italy <sup>1</sup>	<i>Normal consumer<sup>2</sup></i>	1400	500	250
	Children 0-3 yrs.	1400	680	250
	Children & Adolescents	1575	500	250
	Light worker	1750	650	250
	Heavy worker	2475	650	250
	Very heavy worker	3475	650	250
Germany	<i>Normal consumer<sup>1</sup></i>	2425	150 <sup>2</sup>	3500 <sup>3, 4</sup>
	Children 0-3 yrs.	1275	275	3500
	Children 3-6 yrs.	1375	210	3500
	Children 6-10 yrs.	2000	150	3500
	Children 10-14 yrs.	2775	150	3500
	Young persons 14-18 yrs.	2775	150	3500
	Young persons 18-20 yrs.	2775	150	3500
	Night worker	3125	150	3500
	Heavy worker	3825	150	3500
	Very heavy worker	4825	150	3500
Belgium	<i>Normal consumer</i>	2100	60	3500
	Children 0-3 yrs.	2100	60	3500
	Children 3-6 yrs.	2100	60	3500
	Children 6-14 yrs.	2100	60	3500
	Young people 14-18 yrs.	2100	60	3500
	Light worker	2700	60	3500
	Heavy worker	3300	60	3500
	Very heavy worker	3900	60	3500
	Miners	5100	60	3500
Bulgaria	<i>Normal consumer</i>	3865 <sup>1</sup>	100	Free
	Children 0-1 yrs.	1765	100	Free
	Children 1-5 yrs.	1765	100	Free
	Heavy worker	5615	100	Free
	Miners	7365	100	Free
Czechoslovakia: 1) Protectorate of Bohemia and Moravia	<i>Normal consumer</i>	2425	150	2500
	Children 0-3 yrs.	1275	275	2500
	Children 3-6 yrs.	1375	210	2500
	Children 6-10 yrs.	2000	150	2500
	Children 10-14 yrs.	2775	150	2500
	Young people 14-20 yrs.	2775	150	2500
	Night worker	3125	150	2500
	Heavy worker	3825	150	2500
	Very heavy worker	4825	150	2500

## THE LATE AUTUMN OF 1943

1 ounce = 28.4 grammes)

*p.r.*: point rationing; blank: no information

SUGAR	JAM' HONEY	MEAT <sup>D</sup> MEAT PROD.	FATS <sup>E</sup>	LIQUID MILK (WHOLE)	CHEESE	EGGS (PIECES)	COFFEE <sup>F</sup>
225 <sup>1</sup>	115 <sup>2</sup>	s	225 <sup>4</sup>	Free	Free	Free	150 <sup>5</sup>
225 <sup>2</sup>	Free	p.r. <sup>1</sup>	p.r. <sup>1</sup>	Free	p.r. <sup>1</sup>	Free	Free
225 <sup>3</sup>	115 <sup>3</sup>	sh 1/2 <sup>4</sup>	225	1185 <sup>6</sup>	85	7	55 <sup>8</sup>
225	115	sh -/7 <sup>8</sup>	225	3980	85		
225	115		225	1990	85		
125	nil	30-80 <sup>3</sup>	75	200 <sup>4</sup>	100	l.r.	nil
250	450	30-80	75	l.r.	100	l.r.	nil
135	450	30-80	75	l.r.	100	l.r.	nil
125	nil	30-80	75	l.r.	100	l.r.	nil
125	nil	30-80	75	l.r.	100	l.r.	nil
125	nil	30-80	75	l.r.	100	l.r.	nil
225 <sup>5</sup>	175	250	185	nil <sup>6</sup>	60 <sup>8</sup>	.5	60 <sup>F</sup>
225	205	100	135	5250	60	.5	°
225	205	100	200	3500 <sup>7</sup>	60	.5	60 <sup>9</sup>
225	250	300	280	1750	60	.5	60 <sup>9</sup>
225	250	300 <sup>6</sup>	280	1750	60	.5	60 <sup>9</sup>
225	175	300	245	nil	60	.5	60
225	175	250	185	nil	60	.5	60
225	175	450	205	nil	60	.5	60
225	175	600	285	nil	60	.5	60
225	175	850	555	nil	60	.5	60
230	140 <sup>1</sup>	140 <sup>2</sup>	105	s	50	nil	25 <sup>F</sup>
230	140	140	105	5250 <sup>4</sup>	50	nil	25
230	140	140	105	3500	50	nil	25
230	140	140	105	1750	50	nil	25
230	140	140	105		50	nil	25
230	140	180	170		50	nil	25
230	140	220	235		50	nil	25
230	140	260	300		50	nil	25
230	140	300	700		50	nil	25
375	Free	400	200	nil <sup>2</sup>	75		5 <sup>F</sup>
375	Free		100	5250	150 <sup>4</sup>		
375	Free		100	3500 <sup>3</sup>	75		
375	Free			nil	75		5
375	Free			nil	75		5
250 <sup>1</sup>	205	200	175	nil <sup>2</sup>	r <sup>4</sup>	.5	75 <sup>F</sup>
250	235	50	135	3500 <sup>3</sup>		.5	75
250	235	50	135	3500		.5	75
250	235	250	210	1750		.5	75
250	205	250	210	1750		.5	75
250	205	200	175	nil		.5	75
250	205	350	185	nil		.5	110
250	205	500	285	nil		.5	110
250	205	750	555	nil		.5	110

TABLE I  
LEGAL FOOD RATIONS IN  
(Grammes per week; A

Explanation: r: rationed; l.r.: locally rationed;

COUNTRY	CONSUMER CATEGORY	BREAD & B FLOUR (IN TERMS OF BREAD)	CERE- ALS <sup>C</sup>	POTA- TOES
2) Slovakia	<i>Normal consumer</i>	1670 <sup>1</sup>	r <sup>3</sup>	3000
	Children 0-1 yrs.			3000
	Children 1-6 yrs.			3000
	Children 6-14 yrs.			3000
	Heavy worker	1970 <sup>1</sup>		3000
	Very heavy worker	3010 <sup>2</sup>		3000
Denmark	<i>Normal consumer</i>	2350	310 <sup>1</sup>	Free
	Children 0-6 yrs.	1270	230	Free
	Heavy worker	3050	425	Free
	Very heavy worker	3750	540	Free
Finland	<i>Normal consumer</i>	2275	60 <sup>1</sup>	3750
	Children 0-1 yrs.	1365	60	3750
	Children 1-3 yrs.	1365	60	3750
	Children 4-13 yrs.	1820	60	3750
	Adolescents 14-17 yrs.	2730	60	5620
	Light worker	2730	60	5620
	Heavy worker	3640	60	5620
	Very heavy worker	4550	60	5620
France	<i>Normal consumer</i> <sup>1</sup>	2100	55	900 <sup>5</sup>
	Children 0-3 yrs.	955 <sup>2</sup>	125 <sup>3</sup>	900
	Children 3-6 yrs.	1655 <sup>2</sup>	95 <sup>4</sup>	900
	Children 6-13 yrs.	2100	55	900
	Young persons 13-21 yrs.	2625	55	900
	People over 70 yrs.	1655 <sup>2</sup>	55	900
	Heavy worker	2450	55	900
	Very heavy worker	2450	55	900
	Miners	4200	55	900
	Engine drivers	2800	55	900
Hungary	<i>Normal consumer</i>	2660 <sup>1</sup>		2000
	Children 0-3 yrs.	2660		2000
	Children 3-14 yrs.	2660		2000
	Heavy worker	3710		2000
	Very heavy worker	5110		2000
Baltic States	<i>Normal consumer</i>	2000	150	2000
	Children 0-3 yrs.	1000	275	2000
	Children 3-6 yrs.	1100	210	2000
	Young persons 6-18 yrs.	2700	150	2000
	Night worker	2700	150	2000
	Heavy worker	3400	150	2000
	Very heavy worker	4400	150	2000
	Jews <sup>1</sup>	850	75	
Netherlands <sup>1</sup>	<i>Normal consumer</i>	1890 <sup>2</sup>	150	3000
	Children 0-3 yrs.	990	210 <sup>3</sup>	1500
	Children 4-13 yrs.	1890	150	3000
	Young people 14-20 yrs.	2290	150	4500
	Heavy worker	2790	150	4500
	Very heavy worker	3690	150	6000

(Continued)

[ 18 ]

## THE LATE AUTUMN OF 1943

1 ounce = 28.4 grammes)

p.r.: point rationing; blank: no information

SUGAR	JAM HONEY	MEAT <sup>D</sup> MEAT PROD.	FATS <sup>E</sup>	LIQUID MILK (WHOLE)	CHEESE	EGGS (PIECES)	COFFEE <sup>F</sup>
175-230 <sup>4</sup>	Free	200	60	700	Free	1	
300-355	Free	200	125	5250	Free	1	
300-355	Free	200	125	3500 <sup>5</sup>	Free	1	
175-230	Free	200	125	3500	Free	1	
175-230	Free	300	120	700	Free	1	
175-230	Free	300	120	700	Free	1	
300	Free	l.r. <sup>2</sup>	300	Free	Free	Free	nil
300	Free	l.r.	300	Free	Free	Free	nil
300	Free	l.r.	425 <sup>3</sup>	Free	Free	Free	nil
300	Free	l.r.	425 <sup>3</sup>	Free	Free	Free	nil
120 <sup>2</sup>	125	4.2 F. Mks. <sup>4</sup>	125 <sup>5</sup>	2100	<sup>6</sup>	nil	60
255 <sup>3</sup>	125	4.2 F. Mks.	175	7000			60
120	125	4.2 F. Mks.	175	4200 <sup>7</sup>			60
120	125	4.2 F. Mks.	175 <sup>6</sup>	4200			60
120	125	4.2 F. Mks.	125	4200			60
120	125	5.1 F. Mks.	125	2100		nil	60
120	125	5.1 F. Mks.	150	2100		nil	60
120	125	5.6 F. Mks.	175	2100		nil	60
130	l.r.	120	50-70 <sup>7</sup>	nil <sup>8</sup>	50	.25 <sup>9</sup>	35 <sup>F</sup>
300 <sup>6</sup>	l.r.	120	50-70	5250	50	.25 <sup>9</sup>	nil
130	l.r.	120	50-70	5250	50	.5	30 <sup>10</sup>
130	l.r.	120	50-70	1750	50	.5	60 <sup>10</sup>
185	l.r.	200	50-70	nil	50	.5	90 <sup>11</sup>
130	l.r.	120	50-70	nil	50	.25	65 <sup>12</sup>
130	l.r.	220	120-140	nil	50	.25	35
130	l.r.	325	190-210	nil	50	.25	35
130	l.r.	525		nil	50	.25	35
130	l.r.	405		nil	50	.25	35
80-260 <sup>2</sup>	Free	l.r.	140 <sup>4</sup>	nil	Free	1	l.r.
130-260	Free	l.r.	140	5250 <sup>5</sup>	Free	1	l.r.
130-260 <sup>3</sup>	Free	l.r.	140	3500	Free	1	l.r.
80-260	Free	l.r.	225	nil	Free	1	l.r.
80-260	Free	l.r.	225	nil	Free	1	l.r.
150	l.r. <sup>2</sup>	250	180	nil	l.r. <sup>2</sup>	l.r. <sup>2</sup>	80 <sup>F</sup>
200	l.r.	125	100	5250	l.r.	l.r.	nil
200	l.r.	125	160	3500 <sup>5</sup>	l.r.	l.r.	80
150	l.r.	300	230	1750 <sup>4</sup>	l.r.	l.r.	80
150	l.r.	375	200	nil	l.r.	l.r.	80
150	l.r.	500	260	nil	l.r.	l.r.	80
150	l.r.	725	490	nil	l.r.	l.r.	80
75		125	90				40
250 <sup>4</sup>	125	125	145	nil <sup>6</sup>	50	.5	30 <sup>F</sup>
250	125	125	75	5250	50	.5	30
250	125	125	175	3500 <sup>7</sup>	50	.5	30
250	125	125	175	nil	50	.5	30
250	125	300 <sup>5</sup>	220	nil	50	.5	30
250	125	500	440	nil	50	.5	30

TABLE I  
LEGAL FOOD RATIONS IN  
(Grammes per week;<sup>A</sup>

Explanation: *r.*: rationed; *l.r.*: locally rationed;

COUNTRY	CONSUMER CATEGORY	BREAD & <sup>B</sup> FLOUR (IN TERMS OF BREAD)	CERE- ALS <sup>C</sup>	POTA- TOES
Norway	<i>Normal consumer</i>	1820	60 <sup>1</sup>	3000
	Children 0-2 yrs.	910	160 <sup>2</sup>	3000
	Children 2-5 yrs.	1140	160	3000
	Children 5-12 yrs.	1820	160	3000
	Young people 12-20 yrs.	2500	60	3000
	Heavy worker	2500	60	3750
	Very heavy worker	2950-3640	60	4500-6000
Poland <sup>1</sup> Gov. General	<i>Normal consumer</i>	2250 <sup>3</sup>	50	2000
	Children under 14 "Privileged" <sup>2</sup>	1125	75	2000
	and heavy workers	2250-2850	125	4000
Rumania <sup>1</sup>	<i>Normal consumer</i>	2100	1250 <sup>2</sup>	Free
	Heavy worker	4200	2250 <sup>2</sup>	Free
Yugoslavia 1) Croatia	<i>Normal consumer</i>	1375 <sup>1</sup>	115 <sup>2</sup>	2000
	Children 0-2 yrs.		55	1000
	Children 2-5 yrs.		55	
	Heavy worker	2425	115	
2) Serbia <sup>1</sup>	<i>Normal consumer</i>	2000		
	Children 0-3 yrs.	2000		
Ireland	<i>Normal consumer</i>	Free	Free	Free
Spain	<i>Normal consumer</i>	1050-1750 <sup>1</sup>	r.	r.
	Heavy worker	2450		
Sweden <sup>1</sup>	<i>Normal consumer</i>	1515 <sup>2</sup>	300 <sup>3</sup>	Free
	Children 0-5 yrs.	1135	300	Free
	Children 5-8 yrs.	1515	300	Free
	Children 8-13 yrs.	1705	300	Free
	Young persons 13-20 yrs.	1895	300	Free
	Heavy workers	1895-3790	300	Free
Switzerland <sup>1</sup>	<i>Normal Alternative A<sup>2</sup></i>	1755 <sup>3</sup>	80	Free
	<i>Consumer Alternative B</i>	2105	110	Free
	Children 0-5 yrs.	1290 <sup>4</sup>	285	Free
	Children 5-13 yrs.	1755	80	Free
	Young people 13-19 yrs.	2455	80	Free
	Heavy worker	Alt. 2455	80	Free
	Very heavy worker	A 3155	80	Free

(Continued)

## THE LATE AUTUMN OF 1943

1 ounce = 28.4 grammes)

p.r.: point rationing; blank: no information

SUGAR	JAM HONEY	MEAT <sup>D</sup> MEAT PROD.	FATS <sup>E</sup>	LIQUID MILK (WHOLE)	CHEESE	EGGS (PIECES)	COFFEE <sup>F</sup>
200 <sup>3</sup>	70	50 <sup>4</sup>	210	nil <sup>5</sup>	45	nil	nil
200	70	50	210	5250 <sup>6</sup>	45	nil	nil
200	70	50	210	5250	45	nil	nil
200	70	50	210	3500	45	nil	nil
200	70	50	210	1750 <sup>7</sup>	45	nil	nil
200	70	300	210	nil	45	nil	nil
200	70	300	245-315	nil	45	nil	nil
75	125	100 <sup>4</sup>	nil <sup>5</sup>	Lr.	nil	nil	30 <sup>8</sup>
75	125	100	nil	Lr.	nil	nil	30
105-135	185	225-400	125-225	Lr.	nil	nil	60
80-250	Free	500	375	Free	Free	Free	Free
80-250	Free	500	375	Free	Free	Free	Free
75		250	110	nil	100	1	
75		250	110	3500	100	1	
75		250	110	3500	100	1	
75		250		nil	100	1	
125		100	245				
250		100	245				
340	Free	Free	170 <sup>1</sup>	Free	Free	Free	20 <sup>2</sup>
45			r.	Free Free	Free Free	Free Free	r.
425 <sup>4</sup>		500 <sup>8</sup>	250 <sup>7</sup>	Free <sup>8</sup>	35 <sup>9</sup>	1 <sup>10</sup>	60 <sup>11</sup>
425		250 <sup>8</sup>	250	Free	35	1	
425		500	250	Free	35	1	
425		500	310	Free	35	1	
425		500	310	Free	35	1	
425-630		500-1210	310-440	Free	35	1	
115 <sup>5</sup>	60	420	105	2905	50	2 <sup>9</sup>	60 <sup>8</sup>
115	60	nil	105	3720	140	2 <sup>7</sup>	60
175	60	140	115	5115	50	4 <sup>7</sup>	50
115	60	420	105	4305	50	2	60
115	60	490	165	4305	75	2	60
115	60	490	165	3605	75	2	60
115	60	570	225	3605	95	2	60

NOTE: Several countries not given in the table above ration one or more commodities (in grammes per week): Bread: Tunis (3300); Turkey (3150); Rice: Japan (2310); Sugar: Australia (455); New Zealand (340); Japan (170); Meat: Australia (680-1815); Fats: Australia (225); Tea: Australia (55); New Zealand (55); Newfoundland, persons over 10 yrs. (55), under 10 yrs. (15).

LOCAL RATIONING: A partial list of locally rationed commodities not mentioned in the table above is as follows:

FRUIT AND VEGETABLES: Germany, Protectorate, Italy, Norway, Belgium, France, Finland.

FISH: Germany, Protectorate, Italy, Norway, Belgium, France, Finland.

POULTRY: Belgium, France.

- A. Weekly rations: calculated on basis of 4.3 weeks per month.
- B. 100 grammes of flour = 130 grammes of soft bread.
- C. Generally including dried beans and peas.
- D. Meat: as purchased including bone and waste, unless otherwise indicated.
- E. Fats: all fats including butter, margarine, lard and vegetable oil.
- F. Substitute or mixture.

#### CANADA

<sup>1</sup> Additional sugar for home-canning on application.

<sup>2</sup> As an alternative, consumer may buy the same amount of sugar.

<sup>3</sup> Meat consumers receive 2 coupons per week. Each buys  $\frac{1}{4}$  pound of meat in category A (Smoked and cured meats, sliced bacon, etc.);  $\frac{1}{4}$  pounds in category B (fresh and some cured meats (ham), boneless steak, etc.); 1 pound of category C (meat with some bone as for instance sirloin steak);  $\frac{1}{4}$  pounds of Category D (meat with high bone content), fancy meats and meat with more than 50% bone content are unrationed. Meat rationing suspended March 1944.

<sup>4</sup> Butter.

<sup>5</sup> As an alternative—40 grammes of tea per week. Both coffee and tea for persons over 12 years of age.

#### UNITED STATES

<sup>1</sup> Point Rationing. 1. MEAT, FAT, CHEESE. These commodities are rationed on a common point basis (red coupons). Each consumer irrespective of age and occupation receives 16 points a week; the average point value of meat in September 1943 (100 items) was 6.9 points, of fat (7 items) 6.4 points, and of cheese (7 items) 4.8 points. Examples of point values per pound of some important items were as follows: Meat: BEEF—Porter house steak (12 points)—Rump roast bone-in (8 points)—Flank meat (7 points)—Hamburger (7 points)—Veal loin chops (or roast) (10 points)—Round steak cutlets or roast (12 points)—LAMB—MUTTON—Loin chops or roast (9 points)—Leg, whole or part (6 points)—Breast and flank (1 point)—PORK—Tenderloin (10 points)—Loin roast whole, half or end cuts (7 points)—Ham, whole or half (7 points)—BACON—slab or piece—end on (5 points)—Canadian style, piece or sliced (11 points)—READY-TO-EAT-MEATS—Ham, bone-in slices (11 points)—SAUSAGE, Semi-dry sausage (7 points)—Fresh sausage, Group 1, 100% meat content (6 points)—VARIETY MEATS (not included in 100 items taken above) Beef brains (1 point), Beef kidneys (3 points), Veal liver (8 points), Veal tongue (4 points), Lamb-mutton brains (1 point), Lamb-mutton liver (4 points). Fats: LARD (3 points), MARGARINE (4 points), BUTTER, creamy butter (16 points), Cheeses: Cheddar (8 points), cream cheese (3 points), creamed cottage cheese, containing more than 5% butter fat (3 points).

2. CANNED GOODS. Canned goods (fruits, juices, vegetables, concentrated soup and sauce, frozen fruit and vegetables and dried fruits) are rationed on a common point basis (blue coupons). Each consumer receives 48 points per calendar month (or about 11 points a week). Examples of typical point values in September 1943 for cans weighing about one pound are given below: Apricots (18 points), Pineapple (20 points), Berries, all varieties (9 points), Grapefruit juice (2 points), Tomato juice (3 points), Asparagus (12 points), Tomato catsup or chili sauce (20 points), Beans, fresh lima (18 points), Peas (16 points), Beans, green or wax (8 points), Carrots (6 points), Spinach (11 points), Tomatoes (14 points); Frozen foods (over 12 oz. to 16 oz.) all fruits and berries (12 points), Beans, baked (6 points), Corn, cut (12 points), Spinach (12 points); All fruit juices (2 points); Prunes and raisins (4 points per lb.).

<sup>3</sup> 4536 grammes of sugar allowed for jam making for the whole period May 24-Oct. 31. Extra allowance upon application.

#### UNITED KINGDOM

<sup>1</sup> Point Rationing. The following goods are rationed on a common point basis: Canned meats and fish, canned baked beans, biscuits, dried fruits, pulses, cereals, canned fruits and vegetables, condensed milk and porridge oats. Each consumer, irrespective of age and occupation, receives 20 points for a four-week period. Examples of typical values per pound are given below: Canned meat and meat products: Pork sausage—8 points, Minced meat loaf—16 points; Canned fish and fruit—12 points (large tin); Canned vegetables: Beans—4 points, Tomatoes—6 points, Peas—4 points; Condensed milk—unsweetened—4 points (tin); Cereal breakfast foods: Rolled oats—2 points, Wheat flakes—4 points; Rice, Sago and Tapioca—4 points; Dried peas, beans—1 point, Lentils—2 points; Dried fruits—6 points, Dates—8 points; Biscuits: Plain—4 points, Sweet—8 points.

<sup>2</sup> 1 pound of preserves may be exchanged for 1 pound of sugar. During July an extra 1 pound allotted for home-preserving.

<sup>3</sup> Additional ration of 1 lb. of certain imported and home produced jams for each four-week period beginning September 19, October 17, November 14.

<sup>4</sup> In addition bacon and ham rationed at 115 grammes per week per person.

<sup>5</sup> Expectant mothers receive an extra 7d a week of meat on child's ration book.

<sup>6</sup> Expectant mothers receive 3980 grammes a week on child's ration book in addition to normal consumer ration. Mothers of children under 12 months receive priority supply of 3980 grammes a week.

<sup>7</sup> Normal consumer gets from 0.5 to 1.25 shell eggs per week and 1.5 dried eggs. Expectant mothers, infants between 6-18 months and certain classes of invalids get fresh eggs at rate of 3 a week. Children under 5 years get twice the dried egg allotment. Expectant mothers also get one shell egg and two packets of dried egg on child's ration book per allocation period.

<sup>8</sup> Tea only, persons over 5 years. (Coffee free).



**ITALY**

<sup>1</sup> These rations refer to Northern Italy; according to the latest information on Southern Italy, *New York Times*, February 4, 1944, increased imports from the United Nations will allow civilians behind the combat lines 1400 grammes of bread a week as compared with the present ration of 875 grammes.

<sup>2</sup> German workers in Italy receive rations prevailing in Germany.

<sup>3</sup> Rural and urban.

<sup>4</sup> Locally rationed, priority to children, sick, expectant and nursing mothers, men in unhealthy occupations. According to the *New York Times*, July 15, 1943, the ration was 200 grammes per week.

**GERMANY**

<sup>1</sup> In addition, from June to September 1943 consumers were allotted 500 grammes barley, 250 grammes potato flour, 125 grammes rice and an undisclosed cheese ration.

<sup>2</sup> It is reported that from November 1943 the ration of potato starch of 31.25 grammes a week has been halved and the rations given above should accordingly be reduced by some 15 grammes.

<sup>3</sup> Miners receive 4500 grammes of potatoes.

<sup>4</sup> It is reported that from November 1943 the rations have been reduced by 20%.

<sup>5</sup> May 1943—1000 grammes allowed for jam making.

<sup>6</sup> Normal consumer receives 1120 grammes skimmed milk.

<sup>7</sup> Expectant and nursing mothers, and men in unhealthy occupations get same rations as children 3-6 years.

<sup>8</sup> Including 30 grammes of quark.

<sup>9</sup> Children 0-14 years receive 15 grammes of cocoa powder.

**BELGIUM**

<sup>1</sup> Instead of 140 grammes of jam, 105 grammes of honey may be obtained.

<sup>2</sup> In addition 25 grammes of sausage.

<sup>3</sup> Adolescents 14-18 years get 1750 grammes, old people 3500 grammes of skimmed milk.

<sup>4</sup> Expectant and nursing mothers receive the same ration as children under 3 years.

**BULGARIA**

<sup>1</sup> Including 280 grammes of flour in terms of bread.

<sup>2</sup> Skimmed milk locally rationed.

<sup>3</sup> Expectant and nursing mothers receive the same ration as children 1-5 years, sick people 1750 grammes.

<sup>4</sup> Children under 2 years receive the same ration.

**CZECHOSLOVAKIA-PROTECTORATE**

<sup>1</sup> 1 kilogramme of sugar for preserving in addition—May 31-June 27. Normal consumer receives 50 grammes of sweets, children 75 grammes.

<sup>2</sup> Normal consumer gets 400 grammes of skimmed milk.

<sup>3</sup> Expectant and nursing mothers receive the same ration.

<sup>4</sup> Rationed according to supply. Ration for May 1943—16 grammes a week.

**CZECHOSLOVAKIA-SLOVAKIA**

<sup>1</sup> Including 475 grammes of flour in terms of bread.

<sup>2</sup> Including 700 grammes of flour in terms of bread.

<sup>3</sup> Rice, semolina, oatmeal, biscuits reserved for children.

<sup>4</sup> Rural and urban communities respectively.

<sup>5</sup> Expectant and nursing mothers receive the same ration.

**DENMARK**

<sup>1</sup> Oatmeal and barley.

<sup>2</sup> Since May 1943, rationing through retailers on basis of family size, ordinary consumption and economic position.

<sup>3</sup> Butter.

**FINLAND**

<sup>1</sup> Potato flour.

<sup>2</sup> Consumers with tobacco card receive reduced rations.

<sup>3</sup> Children under 6 mos. receive 340 grammes; children 6-12 months receive 170 grammes.

<sup>4</sup> Weekly value. Special ration 5 F. marks from September 16-30. Fish locally rationed.

<sup>5</sup> Double amount of cheese can be obtained on the fat ration.

<sup>6</sup> Children under 7 years.

<sup>7</sup> Expectant and nursing mothers receive 4200 grammes.

**FRANCE**

<sup>1</sup> Wine is rationed at 1 litre per week for normal consumers, 2 for heavy workers, 3 for very heavy workers.

<sup>2</sup> Including 60 grammes of flour in terms of bread.

<sup>3</sup> Including 300 grammes of rice per month.

<sup>4</sup> Including 200 grammes of rice per month.

<sup>5</sup> Département de la Seine.

<sup>6</sup> Children and old people receive 30 grammes of sweets per week.

<sup>7</sup> Rural and urban respectively.

<sup>8</sup> Expectant and nursing mothers get 3500 grammes per week.

<sup>9</sup> Locally rationed.

<sup>10</sup> Chocolate.

<sup>11</sup> Including 55 grammes of chocolate.

<sup>12</sup> Including 30 grammes of chocolate.

**HUNGARY**

<sup>1</sup> Including 700 grammes of flour in terms of bread.

<sup>2</sup> The higher figure relates to Budapest, the lower to rural districts.

<sup>3</sup> Children under 12.

<sup>4</sup> Margarine and lard only—butter irregularly distributed.

<sup>5</sup> Expectant and nursing mothers receive the same ration.

**BALTIC STATES**

<sup>1</sup> Jews employed in war industries receive normal consumer rations. Those not so employed receive half.

<sup>2</sup> According to supply.

<sup>3</sup> Expectant and nursing mothers receive the same ration.

<sup>4</sup> Young persons 6-14 years.

**NETHERLANDS**

<sup>1</sup> According to official information relating to December, 1943, potato rations were 4,000 grammes and milk rations 1750 grammes for "normal consumers." Had it been possible to take these figures into account calorie figures of total "normal consumer rations" would have turned out about 100 calories more than indicated below.

<sup>2</sup> Including 70 grammes of flour in terms of bread.

<sup>3</sup> Children under 2 years receive 60 grammes of rice. Children 2-4 years receive 60 grammes of oatmeal.

<sup>4</sup> Children under 14 years get 50 grammes of sweets and all consumers receive 50 grammes of chocolate.

<sup>5</sup> Night workers receive from 175 to 225 grammes of meat.

<sup>6</sup> Normal consumer gets 1300 grammes and adolescent 14-20 years receive 1750 grammes skimmed milk per week.

<sup>7</sup> Expectant and nursing mothers receive the same ration.

**NORWAY**

<sup>1</sup> Pulses and potato flour.

<sup>2</sup> Children under 12 years receive 100 grammes of rice.

<sup>3</sup> Special distribution of 1 kilogramme sugar in month of August.

<sup>4</sup> All consumers receive 500 grammes of tinned fish per week.

<sup>5</sup> Normal consumers receive 750 grammes and adolescents 1750 grammes of skimmed milk per week.

<sup>6</sup> Expectant and nursing mothers receive the same ration.

<sup>7</sup> Adolescents 12-15 years receive 3500 grammes, 16-18 receive 1750 grammes.

**POLAND**

<sup>1</sup> Germans receive the same rations as in the Reich. Information regarding Jews differs but according to information available their rations for bread (395 grammes per week) and sugar (45 grammes per week) are about half normal consumer rations and they receive no meat, fat, or milk.

<sup>2</sup> "Privileged" refers to official employees and workers in industries performing special tasks for the Germans and their families.

<sup>3</sup> Poles not entitled to wheat bread, wheaten flour, rolls, luxury pastry and cakes.

<sup>4</sup> Poles not entitled to veal and pork, ham, poultry game, salt, fresh and smoked fish, sardines and mackerel, anchovies, marinated fish and crabs.

<sup>5</sup> Information as regards the fat ration differs but it is reasonable to assume that normal consumers and children receive none.

**RUMANIA**

<sup>1</sup> Bucharest only.

<sup>2</sup> 250 grammes are oatmeal, the rest maize flour.

**YUGOSLAVIA—CROATIA**

<sup>1</sup> Including 150 grammes of flour in terms of bread.

<sup>2</sup> Pulses.

**YUGOSLAVIA—SERBIA**

<sup>1</sup> Belgrade.

**IRELAND**

<sup>1</sup> Butter.

<sup>2</sup> Tea only.

**SPAIN**

<sup>1</sup> Rations vary inversely with income.

**SWEDEN**

<sup>1</sup> Swedish rationing system contains about 40 different professional categories. The maximum and minimum rations are indicated above.

<sup>2</sup> Bread free in restaurants.

<sup>3</sup> Including 70 grammes of potato starch.

<sup>4</sup> Instead of 100 grammes of sugar, consumers are permitted to buy 140 grammes of syrup and 125 grammes of artificial honey.

<sup>5</sup> During the second two weeks of July, the above rations were reduced by 20%. Mutton free since February, 1944.

<sup>6</sup> Normally half the normal consumer ration. It may sometimes be somewhat higher or lower.

<sup>7</sup> Extra allowance of 38 grammes per week of butter allowed for period from January 10 to February 21.

<sup>8</sup> Cream free.

<sup>9</sup> Expectant mothers receive additional 330 grammes of cheese a week.

<sup>10</sup> Expectant mothers receive 3 eggs a week.

<sup>11</sup> Children 3-17 receive 6 grammes of cocoa per week.

**SWITZERLAND**

<sup>1</sup> Consumers are permitted to exchange coupons of certain foodstuffs at the following rates: (Autumn 1943) 250 points of meat = 100 grammes of cheese = 100 grammes of beans, peas, etc.: 100 grammes of butter = 200 grammes of cheese: 1 litre of milk = 1000 grammes of cheese.

<sup>2</sup> In addition certain quantities of food released from time to time on the so-called "blind" coupons. It would appear that, in December, extra cereals for a normal consumer amounted to 195 grammes a week.

<sup>3</sup> Including 95 grammes of flour in terms of bread.

<sup>4</sup> Including 185 grammes of flour in terms of bread.

<sup>5</sup> The chocolate ration is 35 grammes per week, other candy 10 grammes.

<sup>6</sup> In addition 50 grammes of egg powder.

<sup>7</sup> In addition 25 grammes of egg powder.

<sup>8</sup> Points per week for coffee, tea and cocoa.

vert them into calories. Calories are a convenient yardstick of quantitative comparison, but they do not, of course, reflect the nutritional value of the diet except as a source of energy.<sup>1</sup>

For the purpose of comparison the countries have been divided into two groups: countries in which practically all foods are rationed, and those in which one or more of the important staple foods is free. In the first group rationed food amounts to 95% or more of the calories normally derived from these foods in peacetime, and rationing can be considered as "total" in the sense that no substantial additions to the rations can be obtained legally. In the second category of countries the total intake of calories is not rationed, as consumers may purchase free foods.

Diagram IA shows the composition and calorie value of legal rations in countries where total rationing is in force. Normal consumers in Germany and Bulgaria receive just about 2000 calories a day, and between 1800 and about 1500 calories in the Protectorate, Finland, the Netherlands, Norway and Belgium. In France, the Baltic States, Italy, Poland and Greece rations vary between 1500 and about 1000 calories.

Diagram IB shows rations in countries where rationing is partial. It is reported that rationing in Roumania is not rigidly applied outside Bucharest, and the rations of fats and cereals are ample.<sup>2</sup> In Denmark, milk and potatoes are free and meat locally rationed; the supply of calories appear to be ample. In Hungary—also a preponderantly agricultural country—the rations in the towns are somewhat smaller, but there are no signs of serious calorie deficiency. In Serbia and Croatia, on the other hand, the rations are

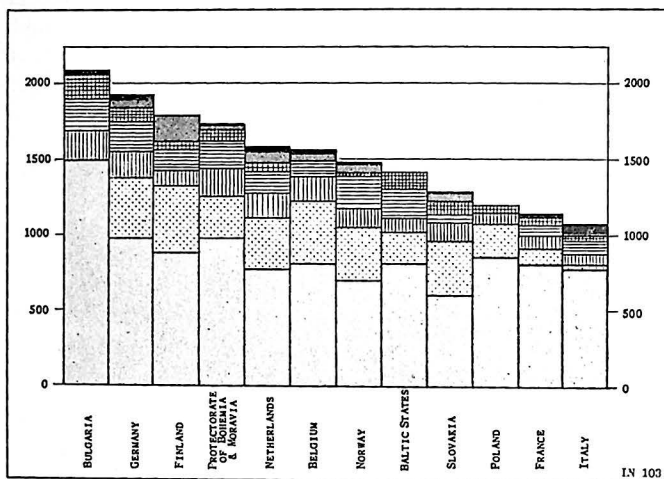
<sup>1</sup> The conversion of the original rations expressed in grammes naturally gives rise to certain errors. Standard calorie tables give figures of the calorie content of individual, well-defined foodstuffs, while we deal here with broad groups composed of a number of different foods. The groups differ in composition from country to country and from time to time in the same country. While an attempt has been made to take into account national differences in the composition of food-groups, it has been found impossible to allow for deterioration during the war in the composition of individual groups—such as the lowering of fat content of meat, milk and cheese. The calories in this study are calories net. The following factors of conversion have been used in expressing 1000 grammes of food in terms of calories: Bread: (1 kg of flour = 1.3 kg of bread) 2600; cereals: 3500 (in the case of Italy 3800); sugar: (jam, honey, etc., in terms of sugar) 3800; potatoes: 800; meat and meat products, 2600 (where separate bacon figures are given the conversion factor is 4500); fats: 7500; milk: 650; cheese: 3000; eggs: 75 apiece.

<sup>2</sup> It has subsequently been reported that food rationing has been abolished in Roumania.

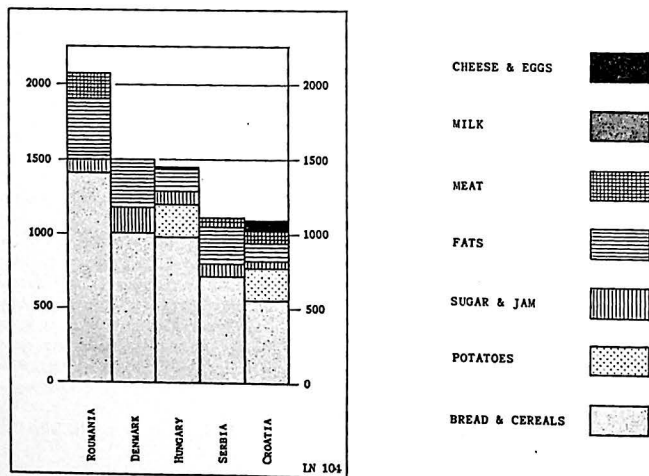
DIAGRAM I








RATIONS IN CALORIES OF "NORMAL CONSUMERS" IN THE  
AUTUMN OF 1943

A. COUNTRIES WHERE RATIONING IS TOTAL  
(95% or more of pre-war consumption)



B. COUNTRIES WHERE RATIONING IS PARTIAL



- CHEESE & EGGS 
- MILK 
- MEAT 
- FATS 
- SUGAR & JAM 
- POTATOES 
- BREAD & CEREALS 

very low, and the supply of unrationed food to the non-agricultural population is understood to be very restricted indeed. The situation in parts of Yugoslavia would seem to be as serious as anywhere in Europe.

*The U.S.S.R.*—Comparable statistics are not available for the U.S.S.R. The Russian rationing system covers all staple foods and rations are sold at fixed minimum prices, but a legal open market exists in which consumers, able to pay the prices ruling may supplement their rations.

The food in the open market comes chiefly from the share in kind received by the collective farmers after the division of the harvest. The very high prices ruling in this market indicate that the supplies entering it are strictly limited.<sup>1</sup>

Consumers are divided into four main categories: Manual workers, office workers, adult dependents and children under 13. The rations are highest for manual workers and fall category by category; but children receive extra rations of milk and dairy products and, in addition, cheap balanced meals in nurseries, kindergartens and primary schools. Nursing and expectant mothers get supplementary rations of milk, sugar and cereals.

Figures of rations by category are available in a few cases only, but Gruliow and Lederer<sup>2</sup> estimate that the average Russian diet based on rationed and free foods adds up to the following quantities per week per head:

	<i>Grammes per week</i>	<i>Calories per day</i>
Bread	3175	1180
Cereals	590	295
Meat	400	150
Potatoes	1050	120
Sugar	85	45
Vegetables	800	40
Cheese	Irregular	—
Total	—	1830

According to this estimate (which does not include any fat purchased as such) the calorie intake *per caput* is about 1800 a day

<sup>1</sup> Open market prices are 800% to 15,000% of the ration prices. Bread per pound costs 0.46 ruble in the rationed and 66.00 rubles in the free market; sugar 2.50 rubles and 363.00 rubles respectively, etc.

<sup>2</sup> *Russia Fights Famine*, by Leo Gruliow and Sidonie K. Lederer, Russian War Relief, Inc., New York, 1944.

—higher for workers and lower for children and dependents.<sup>1</sup> These rations are not significantly lower than in Germany, and are higher than in most of the occupied areas. It should be remembered, however, that the German rations are better composed, containing a much higher proportion of animal foods and fats.

*Changes in rations.* The table below gives a comparison of the calorie rations of "normal consumers" in April 1942 and in the autumn of 1943 in ten countries.

	1942	1943		1942	1943
Bulgaria	—	2085	Belgium	1355	1555
Germany	1625	1930	Norway	1270	1480
Finland	1070	1780	Poland	975	1200
Protectorate	1685	1740	France	1075	1115
Netherlands	1705	1580	Italy	1000	1065*

\* Northern Italy.

In most countries legal rations were increased in 1943; in some cases the improvement is substantial, particularly in Germany, Poland, Finland, Norway, and Belgium. Imports of cereals, sugar and to some extent fats from other parts of Europe largely explain the improvement in the last three countries. There has been no great change in the Protectorate and the Netherlands. In Italy the situation in the autumn of 1943 was dominated by the spread of military operations, and food distribution, which even before this had been better in the North than in the South, became inestimably more uneven. The feeding of the South is now in Allied hands, and the rations in the North, reduced in the early autumn, have been increased to a level somewhat above that a year ago. The North is the chief grain growing area of Italy, and the cutting of communications with the South has increased the supplies available for local distribution. In Denmark the situation would appear to be more favourable than in Germany, although tighter than a year ago, owing to lower rations of sugar and bread and the introduction of local rationing of meat.

<sup>1</sup> Gruliov and Lederer estimate that "the Russian wartime diet provides about 1600 calories a day . . . and 90% of the calories are derived from bread, cereals and potatoes." (p. 1) The 1800 estimate is based on consumption figures which include food purchased in the open market.

Diagram II, which shows changes in the rations by quarter in terms of calories per normal consumer *per diem* on a logarithmic scale, gives a bird's eye view of the changes that have taken place. The figures on which the diagram are based relate to about the middle of each quarter; but as the object is only to show the general trend, no attempt has been made to indicate turning points at their precise historical dates; nor have all minor temporary variations been taken into account.

The increase in the total calorie value of the rations is due largely to the good harvest in 1943. It should not be assumed, however, that diets have necessarily improved in proportion to the increase in calories; during the war European diets have, as the diagram shows, become progressively adjusted to a higher relative consumption of foods of vegetable origin and a lower consumption of foods of animal origin. This has rendered available for direct human consumption foods which were previously used for feeding purposes; an increased human consumption of vegetable foods is possible, therefore, even when total crops have decreased or are decreasing. The real significance of the improvement noted above can be understood only after an analysis of the composition of the diets.

*Rations of different consumer categories.* As already mentioned, rations have tended to become more and more differentiated. As the scope of rationing is expanded such differentiation becomes indispensable, for when all or nearly all foods are rationed the individual cannot exercise his choice and special provision has to be made to meet special needs. This differentiation has been both quantitative and qualitative. Persons employed in work requiring great physical activity receive in most countries rations containing more energy producing foods, while children, sick persons, nursing and expectant mothers receive more protective foods such as milk, fruit juice, and eggs.

Table II shows the rations of different categories of workers as percentages of "normal consumer" rations.

In considering this table it is useful to have in mind the estimated calorie requirements under different conditions of work. It has been estimated that a shoemaker uses 2000/2400 calories a day, a weaver 2400/2700, a carpenter or a mason 2700/3200, a

DIAGRAM II

TREND OF FOOD RATIOnS IN VARIOUS COUNTRIES, 1941-1943

(Calories per "normal consumer" per diem)

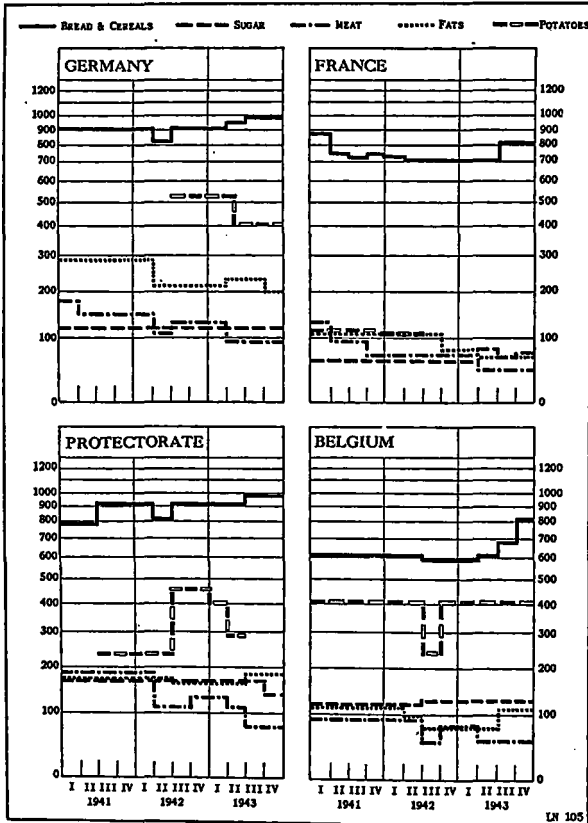
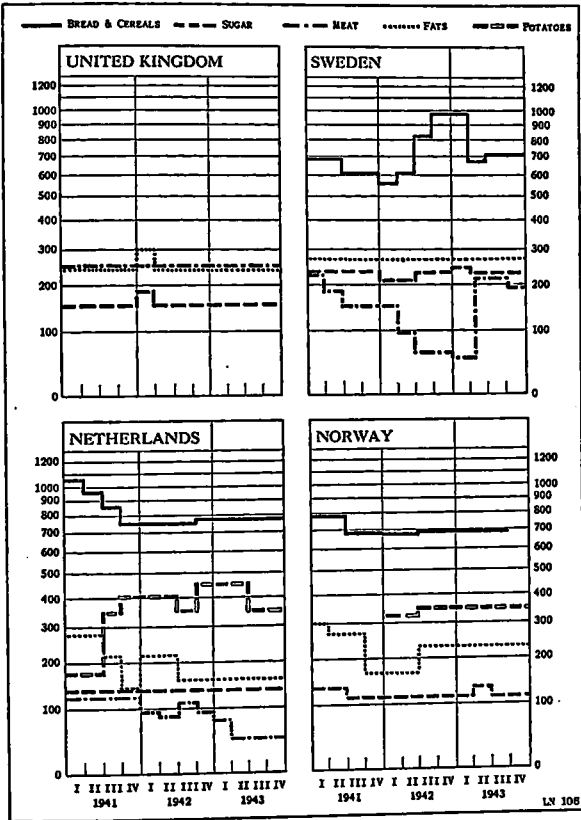




DIAGRAM II (cont'd)



TABL

RATIONS OF DIFFERENT CATEGORIES OF WORKERS IN CALO

COUNTRY	TOTAL RATIONS							
	Normal Consumer		Light Worker		Heavy Worker		Very Heavy Worker	
	Calories	Index	Calories	Index	Calories	Index	Calories	Index
Italy	1065	100	1275	120	1545	145	1915	180
Germany	1930	100	2285	118	2685	139	3435	178
Belgium	1555	100	1860	120	2170	140	2480	159
Bulgaria	2085	100	—	—	2735	131	—	—
Czechoslovakia:								
Protectorate	1740	100	2070	119	2490	143	3245	186
Slovakia	1290	100	—	—	1500	116	1890	147
Denmark	1500	100	—	—	1965	131	2280	152
Finland	1780	100	2180	122	2540	143	2905	163
France	1115	100	—	—	1355	122	1470	132
Hungary	1475	100	—	—	1955	133	2470	167
Baltic States	1420	100	1745	123	2115	122	2815	198
Netherlands	1580	100	—	—	2235	141	3050	193
Norway	1480	100	—	—	1875	127	2415	163
Roumania	2080	100	—	—	3360	162	—	—
Yugoslavia:								
Croatia	1110	100	—	—	1500	135	—	—
Sweden	1420	100	—	—	2240	158	—	—
Switzerland	1350	100	—	—	1780	132	2140	159

farm laborer 3200/4100 and a lumberman 5000 and up.<sup>1</sup> In Germany a light worker's rations contain 2285 calories, a heavy worker's 2685 and a very heavy worker's 3435 calories. Only in the highest categories would intake appear far below requirements. Rations in the occupied area are lower and the extra allowances for heavy work tend to be highest in the countries in which the basic rations are highest; when the basic rations are low, the percentage increases may be inadequate to supply the extra energy required. Men on an average require more calories than women; a seamstress may require 1800/2100 calories a day, while a woman

<sup>1</sup> See, for instance, Henry C. Sherman and Caroline Sherman Lanford, *Essentials of Nutrition*, New York, 1940, p. 78. In more general terms the League of Nations Health Organization gives the following average supplement to the basic allowance (2400 calories net) for muscular activity: Light work up to 75 calories per hour of work, moderate work 75-150, hard work 150-300, very hard work 300 and up.

## E II

## RIES AND AS PERCENTAGE OF NORMAL CONSUMERS RATIONS

<i>Bread &amp; Flour</i>			<i>Meat &amp; Meat Products</i>			<i>Fats</i>		
<i>Light Worker</i>	<i>Heavy Worker</i>	<i>Very Heavy Worker</i>	<i>Light Worker</i>	<i>Heavy Worker</i>	<i>Very Heavy Worker</i>	<i>Light Worker</i>	<i>Heavy Worker</i>	<i>Very Heavy Worker</i>
<i>Index</i>	<i>Index</i>	<i>Index</i>	<i>Index</i>	<i>Index</i>	<i>Index</i>	<i>Index</i>	<i>Index</i>	<i>Index</i>
125	177	248	100	100	100	100	100	100
129	158	199	179	237	332	110	153	298
128	157	186	130	160	190	164	227	291
—	145	—	—	100	—	—	100	—
129	158	199	173	247	373	108	165	322
—	118	181	—	147	147	—	200	200
—	131	162	—	—	—	—	142	142
120	160	200	144	144	144	100	119	137
—	117	117	—	178	267	—	215	331
—	139	191	—	—	—	—	160	160
135	170	219	147	195	284	110	144	269
—	148	196	—	244	411	—	152	303
—	138	181	—	550	550	—	100	133
—	200	—	—	100	—	—	100	—
—	176	—	—	100	—	—	100	—
—	188	—	—	173	—	—	148	—
—	140	180	—	116	135	—	164	218

actively engaged in housework may require 2300/2900. An adolescent boy may burn 3500 calories, while 1500/2000 may suffice for persons over 70 years of age. Hence, "normal consumers" are differently treated when receiving the same ration: young persons receive in relation to needs less calories than old persons, men, less than women, and single men are usually worse off than persons living in family groups.

Heavy and very heavy workers usually receive larger rations not only of cereals, but also of fat and meat. As a result, their diets are probably somewhat better composed nutritionally than those of normal consumers. The chief qualitative differences, however, relate to children's diets. Children's energy requirements are lower than those of adults. To what extent has been variously estimated; but we may adopt the scale of energy requirements laid down by

the Health Organisation of the League of Nations. This scale represents average conditions, and should be interpreted in the light of this fact. Consumption below the average optimum figure is not necessarily harmful, especially over a short period of time.

Table III has been compiled with the aid of this scale. It shows the relationship between energy requirements and rations by age group, and for nursing and expectant mothers. As the age groups in the League Scale and in the rationing systems are different, it has been necessary to show each year of age up to 14 separately and to calculate the requirements for each age by interpolation. The figures relate to theoretical basic needs; but in fact the muscular activity of children varies greatly and extra allowances would frequently be required. Here, these extra needs have been neglected except for the group 14-20 which has been considered to require 3000 calories.<sup>1</sup>

The table illustrates the difficulties of differential rationing. Physiological requirements change gradually during the period of growth. It is practically impossible, however, to change the rations of a child at frequent intervals; and as a general rule, it has been found necessary to divide children and young persons into 3 or 4 groups. The first group, for instance, may include children of 0-3 years of age; but a child of one requires less calories than a child of three, and as both have equal rations, the younger child, in terms of requirements, a larger ration than the older child. The greater the span within each age-group, the greater are the inequalities created.

The ratio between requirements and rations is throughout high for the youngest age groups; infants under 1 have a ratio of 264 in Germany; it is over 200 in all countries included in the table except in the Netherlands, France, the Baltic States, Italy and Poland; in the last mentioned country the figure is only 111. Ratios are by all indications even lower in parts of Yugoslavia and occupied Russia.

In all countries the ratio between rations and needs drops with age until the rations fall, ultimately, below standard requirements;

<sup>1</sup> This figure agrees well with the average figure for adolescents 13-20, as recommended by the Committee on Food and Nutrition of the United States Research Council in connection with the May 1941 National Nutritional Conference for Defense, in Washington, D.C. It recommended the following daily allowances:

Girls: 13-15 yrs.	2800 calories.	Boys: 13-15 yrs.	3200 calories.
" 16-20 "	2400 "	" 16-20 "	3800 "

TABLE III

## CHILDREN, NURSING AND EXPECTANT MOTHERS: RATIONS IN CALORIES PER DIEM COMPARED WITH NORMAL REQUIREMENTS

a = Rations in Calories

b = Rations as Percentage of Requirements

Consumer Category		Italy	Germany	Belgium	Czechoslovakia		Finland	France	Baltic States	Netherlands	Norway	Poland
					Prot.	Slovakia						
Adult Male	a.	1065	1930	1555	1740	1290	1780	1115	1420	1580	1480	1200
(Requirements 2400)	b.	44	80	65	73	54	74	46	59	66	62	50
Nursing & Exp. Mothers	a.	1065	2195	2045	2045	1550	1975	1440	1745	1835	1930	1200
(Requirements 2400-3000)	b.	44-36	91-73	85-68	85-68	65-52	82-66	60-48	73-58	76-61	80-64	50-40
Children 0-1	a.	1355	1900	2045	1605	1855	2020	1310	1490	1455	1645	800
(Requirements 720)	b.	188	264	284	223	258	281	182	207	202	228	111
Children 1-2	a.	1355	1900	2045	1605	1690	1685	1310	1490	1455	1645	800
(Requirements 840)	b.	161	226	243	191	201	201	156	177	173	196	95
Children 2-3	a.	1355	1900	2045	1605	1690	1685	1310	1490	1455	1730	800
(Requirements 1000)	b.	136	190	205	161	169	169	131	149	146	173	80
Children 3-4	a.	1065	1805	1880	1605	1690	1685	1460	1395	1455	1730	800
(Requirements 1128)	b.	94	160	167	142	150	149	129	124	129	153	71
Children 4-5	a.	1065	1805	1880	1605	1690	1855	1460	1395	1870	1730	800
(Requirements 1248)	b.	85	145	151	129	135	149	117	112	150	139	64
Children 5-6	a.	1065	1805	1880	1605	1690	1855	1460	1395	1870	1815	800
(Requirements 1368)	b.	78	132	137	117	124	136	107	102	137	133	58
Children 6-7	a.	1065	2000	1720	1805	1620	1855	1280	1910	1870	1815	800
(Requirements 1512)	b.	70	132	114	119	107	123	85	126	124	120	53
Children 7-8	a.	1065	2000	1720	1805	1620	1855	1280	1910	1870	1815	800
(Requirements 1632)	b.	65	123	105	111	99	114	78	117	115	111	49
Children 8-9	a.	1065	2000	1720	1805	1620	1855	1280	1910	1870	1815	800
(Requirements 1752)	b.	61	114	98	103	92	106	73	109	107	104	46
Children 9-10	a.	1255	2000	1720	1805	1620	1855	1280	1910	1870	1815	800
(Requirements 1872)	b.	67	107	92	96	87	99	68	102	99	97	43
Children 10-11	a.	1255	2285	1720	1805	1620	1855	1280	1910	1870	1815	800
(Requirements 1992)	b.	63	115	86	91	81	93	64	96	94	91	40
Children 11-12	a.	1255	2285	1720	2075	1620	1855	1280	1910	1870	1815	800
(Requirements 2160)	b.	58	106	80	96	75	86	59	88	87	84	37
Children 12-13	a.	1255	2285	1720	2075	1620	1855	1280	1910	1870	1955	800
(Requirements 2280)	b.	55	101	75	91	71	81	56	84	82	86	35
Children 13-14	a.	1255	2285	1720	2075	1620	1855	1465	1910	1870	1955	800
(Requirements 2400)	b.	52	95	72	86	68	77	61	80	78	81	33
Young Persons 14-20	a.	1255 <sup>1</sup>	2135 <sup>1</sup>	1650 <sup>1</sup>	1890	—	2355 <sup>2</sup>	1465 <sup>3</sup>	1910 <sup>1</sup>	1965	1955	—
(Requirements 2400-3000)	b.	52-42	89-71	69-55	79-63	—	98-79	61-49	80-64	82-66	81-65	—

<sup>1</sup> Up to 18 years, then normal consumer rations.<sup>2</sup> Up to 17 years, then normal consumer rations.<sup>3</sup> Up to 21 years, then normal consumer rations.

the critical level is reached first in countries where the level of food consumption is low. In Germany and the Protectorate children up to 10-12 years of age enjoy a surplus; the corresponding age limit in the Baltic States is 9-10, in Finland, the Netherlands and Norway 8-9, Belgium 7-8, in France 5-6, in Italy 2-3, and in Poland 0-1. Maximum deficiencies are to be found in the age group 14-20. The rations of this group represent the following percentages of normal requirements (3000 calories): Germany 71, Finland 79, the Netherlands 66, Norway 65, Belgium 55, France 49, the Baltic States 64, and Italy 42.

As a general rule, therefore infants and young children are given a privileged position in most rationing systems. Their rations are quantitatively satisfactory in Germany, the Protectorate, Finland, the Netherlands up to the age of about 10, and in Norway perhaps not quite up to that age. In fact, they yield a substantial surplus—diminishing with the child's age—that can be used to supplement the rations of other family members. During the first year of life, this surplus in Germany, for instance, amounts to about 1180 calories a day, enough to bring the rations of both father and mother, if they are normal consumers, above the level of standard requirements.

Children's rations are not only more generous in quantity as compared with requirements of adult "normal consumers" but they contain more of the protective foods. The main addition to children's diet is milk which in a majority of cases is reserved for children, nursing and expectant mothers. Table IV below shows children's milk rations in continental Europe.

By way of comparison it can be mentioned that the British ration of milk is 570 grs. per day for children under 6, and half of this for children 6-14 years of age. On the continent of Europe the group 0-3 receives 750 grs. per day for children except in the Protectorate (500) grs., Italy, certain districts of Poland and Yugoslavia, occupied Russia and Greece. The rations for the age group 3-6 years are again, with the exceptions noted, fairly adequate at about 500 grs. a day. The rations for the higher age groups 6 years and over are generally deficient, though in Finland, and the Netherlands, for instance, they are higher for girls and boys of 10-14 years than in the United Kingdom.

*Relation between normal consumer's and average rations. In*

TABLE IV  
MILK RATIONS FOR CHILDREN IN CERTAIN COUNTRIES AS OF  
THE LATE AUTUMN OF 1943  
(Grammes per diem)

	Under 3 yrs.	3-6 yrs.	6-10 yrs.	10-14 yrs.
Germany	750	500	250	250
Belgium	750	500	250	250
Bulgaria	750 <sup>1</sup>	500 <sup>2</sup>	—	—
Czechoslovakia (Protectorate)	500	500	250	250
Slovakia	750 <sup>1</sup>	500 <sup>2</sup>	500	500
Finland	1000 <sup>1</sup> -600 <sup>2</sup>	600	600	600
France	750	750	250	250
Hungary	750	500	500	500
Baltic States	750	500	250	250
Netherlands	750	500	500	500
Norway	750 <sup>1</sup>	750 <sup>2</sup>	500 <sup>3</sup>	250 <sup>4</sup>
Yugoslavia (Croatia)	500 <sup>1</sup>	500 <sup>2</sup>	—	—

*Bulgaria:* <sup>1</sup> Children under 1 yr.    <sup>2</sup> Children 1-5 yrs.

*Slovakia:* <sup>1</sup> Children under 1 yr.    <sup>2</sup> Children 1-6 yrs.

*Finland:* <sup>1</sup> Children under 1 yr.    <sup>2</sup> Children 1-3 yrs.

*Norway:* <sup>1</sup> Children 0-2 yrs.    <sup>2</sup> Children 2-5 yrs.    <sup>3</sup> Children 5-12 yrs.

<sup>4</sup> Young people 12-20 yrs.

*Yugoslavia:* <sup>1</sup> Children 0-2 yrs.    <sup>2</sup> Children 2-5 yrs.

view of the wide differences between the rations of different consumer groups, a comparison based on a single group such as the normal consumer may be misleading. Fortunately it is possible to make a rough check on the representative character of the normal consumer for France and Germany, as the figures of the number of consumers in each country are available for 1941; with the aid of these figures a weighted average of the consumptions per head of the civilian non-agricultural population may be calculated. Were the agricultural population included the average would, of course, be higher. Table V shows the average consumption per head so computed and the rations of the normal consumer.

These figures suggest that rations of all consumers are somewhat higher than those of normal consumers. The reason for this is not difficult to find. The rations of children are not so much below normal consumers rations as to outbalance the extra rations

TABLE V

RATIONS (IN CALORIES PER DIEM) OF "ALL CONSUMERS" AND "NORMAL CONSUMERS" IN FRANCE AND GERMANY

	<i>Bread</i>	<i>Cereals</i>	<i>Potatoes</i>	<i>Sugar</i>	<i>Meat</i>	<i>Fat</i>	<i>Milk</i>	<i>Cheese</i>	<i>Eggs</i>	<i>Total</i>
<i>France</i>										
Normal Consumer	780	30	100	70	45	65	—	20	5	1115
All Consumers	770	35	100	75	60	95	85	20	5	1245
<i>Germany</i>										
Normal Consumer	900	75	400	170	95	200	60*	25	5	1930
All Consumers	958	80	400	175	117	235	115	25	5	2110

\* Skimmed milk.

granted to heavy workers. It is of interest to note, too, that the composition of the rations of all consumers is nutritionally superior to that of normal consumers, owing mainly to the larger rations of milk, etc., granted to children. In countries in which children constitute a different proportion of the total population the results would, of course, be different; but in spite of this fact the figures suggest that the normal consumers rations rather understate than overstate average rations per head of population.

*Worker's Family Consumption.* In general the single individual is less favorably placed under any rationing scheme than the family. This is due both to the greater economy of cooking for a number of persons and to the fact to which reference has already been made, that in most countries there is a surplus of calories, at any rate for children of the lower age groups. It is of interest, therefore, to calculate family rations for a typical family.

In peacetime most countries compute cost of living indices which represent changes in the cost of living of a "typical" working class family. The "basket" of foods and other goods priced in the computation of these indices are obtained by family budget enquiries, which supply the most reliable information we possess on the level and composition of actual diets.<sup>1</sup> In order to link up ration figures with peacetime figures of actual consumption, it is

<sup>1</sup> Figures of national consumption per head are not generally available for more than a few items. Moreover, in the case of many products—cereals, sugar, etc.—it is difficult to distinguish with precision between quantities used for human consumption and for other uses.



necessary to use a unit of comparison as nearly as possible identical to the "typical" family of the budget enquiries. A typical family in this sense, which may or may not be an average family, is composed of husband, wife, and two or three children. It differs, of course, from country to country and in order to have figures fully comparable with peacetime conditions, it would be necessary to take for each country a family identical to that in the budget enquiries. But the national differences are not great, and in order to allow international comparison a standard family has been taken, composed of husband, wife and three children aged 3, 6 and 9. In order to render the figures comparable with standards of physiological requirements, they are given, not per family, but per consumption unit. The consumption unit is the adult male and the typical family used here is according to the League scale taken as equivalent to 3.32 adult males. Subject to these reservations Table VI shows: (1) pre-war consumption of a typical working class family; (2) rations of a "normal consumer" in 1943; and (3) rations per "consumption unit" of a typical family in the same year.

The rations per consumption unit are naturally higher than the rations of the normal consumer. The total rations in terms of calories are compared in Diagram III with peacetime consumption. When examining Table VI and Diagram III it is necessary to bear in mind that the pre-war consumption levels in the different countries vary widely. The diagram shows, therefore, the changes that have taken place; it does not show the comparative adequacy of the various rations today.

The inadequacy of the rations in terms of calories as compared with pre-war consumption according to this calculation amounts to about 50% in Poland for a normal consumer's family; heavy and very heavy workers are slightly better off. Jews have only half of the normal consumer rations. In the Baltic States, Italy and Belgium, and although peacetime figures are lacking, no doubt also in France, the decrease is between some 40 and 25 per cent. In Norway, Netherlands, Finland and the Protectorate, it is between 20 and 10 per cent. In Bulgaria and Germany rations of normal consumers are as large as before the war, but those of heavy workers exceed the average pre-war working class consumption. No doubt in normal times such workers tended to consume more calories than those doing lighter work.

**TABLE VI**  
**COMPARISON OF FOOD CONSUMPTION (IN CALORIES PER DIEM) PER CONSUMPTION UNIT IN THE INTER-WAR PERIOD AND PER "NORMAL CONSUMER" AND CONSUMPTION UNIT IN THE AUTUMN OF 1943<sup>1</sup>**

	ITALY			GERMANY			BELGIUM			BULGARIA				
	1929		1943	1927/28		1943	1928/29		1943		1927/28		1943	
	C.U.	N.C.	C.U.	C.U.	N.C.	C.U.	C.U.	N.C.	C.U.	C.U.	N.C.	C.U.	N.C.	C.U.
Bread & Flour	1320	520	805	995	900	1065	1495	780	1175	1980	1435	1925		
Cereals	605	270	435	70	75	140	45	30	45	190	50	75		
Potatoes	—	30	45	355	400	600	485	400	600	40	—	—		
Sugar, Jam, etc.	55	70	200	195	170	265	205	165	250	110	205	310		
Meat & Meat Products	90	30	45	350	95	115	355	50	75	240	150	225		
Fish	15	—	—	10	—	—	10	—	—	5	—	—		
Fats	305	80	120	485	200	320	570	110	165	205	215	290		
Whole Milk	50	20	30	280	—	295	260	—	295	45	—	100		
Skimmed Milk	—	—	—	5	60	35	—	—	—	5	—	—		
Cream	—	—	—	—	—	—	—	—	—	—	—	—		
Cheese	30	45	70	40	25	40	45	20	30	50	30	55		
Eggs	35	—	—	35	5	10	45	—	—	15	—	—		
Fresh Vegetables	45	—	—	30	—	—	35	—	—	40	—	—		
Fresh Fruits	10	—	—	50	—	—	25	—	—	35	—	—		
<b>TOTAL</b>	<b>2560</b>	<b>1065</b>	<b>1750</b>	<b>2900</b>	<b>1930</b>	<b>2885</b>	<b>3575</b>	<b>1555</b>	<b>2635</b>	<b>2960</b>	<b>2085</b>	<b>2980</b>		
	CZECH.-PROTECT.			FINLAND			FRANCE			ESTONIA				
	1931/32		1943	1928		1943	1943		1943		1937/38		1943	
	C.U.	N.C.	C.U.	C.U.	N.C.	C.U.	N.C.	C.U.	C.U.	N.C.	C.U.	N.C.	C.U.	
Bread & Flour	1190	900	1065	1010	845	1070	780	995	1175	745	985			
Cereals	70	75	140	160	30	45	30	60	145	75	140			
Potatoes	220	285	430	250	430	650	100	150	345	230	345			
Sugar, Jam, etc.	305	195	305	310	100	150	70	135	310	80	140			
Meat & Meat Products	285	75	85	250	45	70	45	70	450	95	115			
Fish	—	—	—	20	—	—	—	—	35	—	—			
Fats	405	185	265	420	135	250	65	95	280	195	275			
Whole Milk	275	—	245	555	195	470	—	345	370	—	295			
Skimmed Milk	—	20	15	20	—	—	—	—	10	—	—			
Cream	—	—	—	55	—	—	—	—	15	—	—			
Cheese	30	—	—	10	—	—	20	30	15	—	—			
Eggs	40	5	10	15	—	—	5	10	25	—	—			
Fresh Vegetables	30	—	—	—	—	—	—	—	30	—	—			
Fresh Fruits	55	—	—	—	—	—	—	—	65	—	—			
<b>TOTAL</b>	<b>2905</b>	<b>1740</b>	<b>2560</b>	<b>3075</b>	<b>1780</b>	<b>2705</b>	<b>1115</b>	<b>1890</b>	<b>3270</b>	<b>1420</b>	<b>2295</b>			

1941

<sup>1</sup> For information on peace-time data see *Wartime Rationing and Consumption*, pp. 44-45, and on war-time data Table I above.

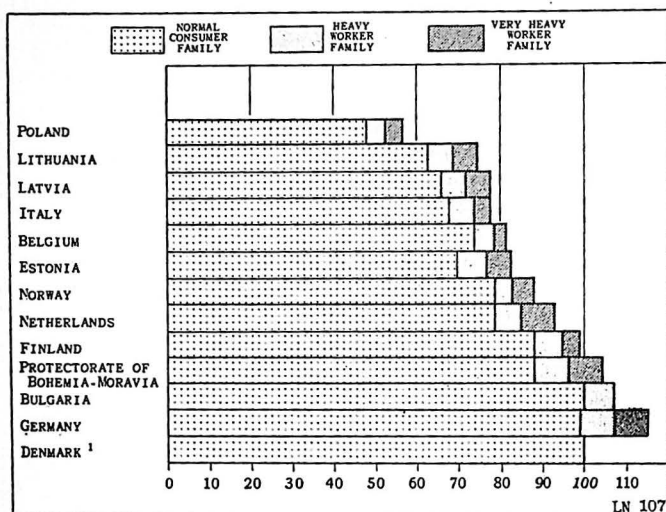
TABLE VI (Continued)

	LATVIA			LITHUANIA			NETHERLANDS			NORWAY				
	1943		C.U.	1943		C.U.	1943		C.U.	1943		C.U.		
	36/37	N.C.		36/37	N.C.		35/36	N.C.		27/28	N.C.			
Bread & Flour	1155	745	985	1275	745	985	1210	700	955	1090	675	940		
Cereals	65	75	140	10	75	140	60	75	120	55	30	90		
Potatoes	380	230	345	400	230	345	370	340	460	205	340	510		
Sugar, Jam, etc.	330	80	140	265	80	140	250	170	255	280	130	195		
Meat & Meat Products	475	95	115	680	95	115	235	45	70	310	20	30		
Fish	25	—	—	15	—	—	10	—	—	65	—	—		
Fats	340	195	275	335	195	275	510	155	230	590	225	340		
Whole Milk	465	—	295	300	—	295	310	—	345	290	—	340		
Skimmed Milk	15	—	—	—	—	—	25	70	40	45	40	25		
Cream	105	—	—	110	—	—	10	—	—	85	—	—		
Cheese	15	—	—	60	—	—	45	20	30	70	20	30		
Eggs	25	—	—	50	—	—	40	5	10	30	—	—		
Fresh Vegetables	30	—	—	55	—	—	55	—	—	15	—	—		
Fresh Fruits	75	—	—	80	—	—	65	—	—	25	—	—		
<b>TOTAL</b>	<b>3500</b>	<b>1420</b>	<b>2295</b>	<b>3635</b>	<b>1420</b>	<b>2295</b>	<b>3195</b>	<b>1580</b>	<b>2515</b>	<b>3155</b>	<b>1480</b>	<b>2500</b>		
	POLAND			SWEDEN			SWITZERLAND							
	1943		C.U.	1933		C.U.	1943		C.U.	1936/37		C.U.	1943	
	1929	N.C.		1933	N.C.		C.U.	N.C.		1943	N.C.			
Bread & Flour	1550	835	885	900	560	825	735	650	930					
Cereals	100	25	50	65	150	225	195	40	90					
Potatoes	445	230	345	250	—	—	145	—	—					
Sugar, Jam, etc.	215	75	115	435	230	345	325	80	130					
Meat & Meat Products	335	35	55	350	185	250	255	155	200					
Fish	5	—	—	25	—	—	—	—	—					
Fats	120	—	—	510	270	425	390	110	170					
Whole Milk	140	—	—	435	—	—	485	270	545					
Skimmed Milk	5	—	—	10	—	—	—	—	—					
Cream	20	—	—	70	—	—	—	—	—					
Cheese	15	—	—	55	15	25	55	20	30					
Eggs	15	—	—	55	10	15	40	25	45					
Fresh Vegetables	50	—	—	10	—	—	50	—	—					
Fresh Fruits	10	—	—	55	—	—	140	—	—					
<b>TOTAL</b>	<b>3025</b>	<b>1200</b>	<b>1450</b>	<b>3225</b>	<b>1420</b>	<b>2110</b>	<b>2815</b>	<b>1350</b>	<b>2140</b>					

## DIAGRAM III

WORKERS' DIETS IN THE AUTUMN OF 1943 AS PERCENTAGE  
OF PRE-WAR CONSUMPTION

(Calories per consumption unit per diem)

<sup>1</sup> 3000 calories or more.

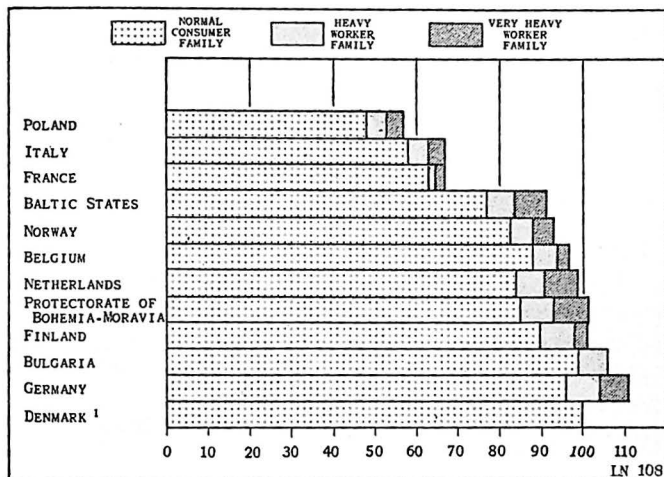
In order to permit international comparison in spite of the wide variations in pre-war national consumption it is convenient to compare rations with physical requirements. Three thousand calories per consumption unit a day may perhaps be taken as an optimum figure for the requirements of an active population. But it is definitely an optimum. Large sections of the population—even in Western Europe—existed on a far less generous allowance.<sup>1</sup> The three thousand calorie standard assumes an average body weight of 70 kgs. But body weight is less in Southern Europe, for instance, than in Northwestern Europe and North America. Moreover requirements are smaller in a warm than in a cold climate. It is not quite accurate therefore to apply the same standard of requirements

<sup>1</sup> Unemployed workers' budgets on the continent of Europe in peacetime contained as little as 1700-1800 calories per consumption unit a day. See in particular, International Labour Office, *Workers Nutrition and Social Policy*, Appendix V.

## DIAGRAM IV

WORKERS' DIETS IN THE AUTUMN OF 1943 AS PERCENTAGE OF  
NORMAL REQUIREMENTS (3,000 CALORIES)

(Calories per consumption unit per diem)



<sup>1</sup> 3000 calories or more.

to countries as different, for instance, as Italy and Norway. But to make the correct allowances on account of all these factors is impossible. Diagram IV shows, therefore, the estimated family consumption in each country as a percentage of the three thousand calorie standard.

It has unfortunately not been possible to construct index figures for the most seriously affected areas—Greece, parts of Yugoslavia or occupied Russia. But in order to give an impression of conditions in these areas, as it were, below the level of statistical measurement, it has been thought of interest to summarise by the way of illustration, information available on the situation in Greece. This country normally imported about 25% of her requirements of cereals and large quantities of cattle. Owing to the cessation of imports, the fall in production and the strain of seven months of war, available supply in the autumn of 1941 is estimated to have been at most

40% of normal. The loss of the richest grain-producing areas to Bulgaria further accentuated existing scarcities. Attempts at price-control and rationing under these conditions of extreme scarcity tended rather to hamper the movement of goods from country to town than greatly to aid the urban population. Not even the black market could—in spite of soaring prices—furnish substantial quantities of food.

On August 15, 1941, bread rations were reduced from 192 to 96 grammes per person a day in the Athens-Pireus region where the situation was the most serious; but even this reduced quantity was not regularly available. On different occasions between June and August the following one time distributions were made: sugar 130 grammes, rice 130 grammes, and meat 65 grammes. Between September 1941 and April 1942 conditions further deteriorated, and famine resulted. Bread distributions varied from time to time between 192 and 45 grammes a day, and were intermittently suspended. During this period children received 640 grammes of figs and certain quantities of currants. The calorie value of the distributed foods is calculated to have been 458 per person a day in July 1941, 183 in November and 357 in March 1942. Communal soup kitchens had been set up, but they supplied, it is estimated, only 140 calories a person a day. Taking into account all sources, including the black market, it is estimated that for the majority of the population the daily calorie intake per head was about 600-800, or per consumption unit of a typical family perhaps 950-1200 calories, representing about a third of standard nutritional requirements. It should be remembered, however, that, owing to the absence of any regular system of distribution, these averages are not strictly comparable with those in countries having a regular rationing system; the food available varied for different categories and from time to time; the population lived from hand to mouth.

Certain imports from Turkey, Palestine, and the United States arrived in the early spring of 1942 and from April to September 1942 bread distribution varied between 160 and 215 grammes per head a day, and the International Red Cross supplied extra food to the local soup kitchens; between February and May 1942 the number of meals served by these centres increased from 465,000 to 833,000 a day. Minute quantities of olive oil, sugar, rice and currants were also distributed.

In September 1942 a relief plan came into force under which the Allied Governments consented to send food to occupied Greece under the supervision of a commission composed of representatives of the International and Swedish Red Cross; the necessary shipping tonnage for imports was obtained from Sweden.

Conditions at once improved; the Commission distributed some fifteen thousand tons of wheat, and three thousand tons of pulses a month to about three million persons. The average weekly distribution amounted to about 1500 grammes of flour, gruel, etc., expressed in terms of bread.<sup>1</sup> The rations were slightly higher in Athens than in the provinces, and varied somewhat—according to the shipping situation—from month to month.

During the spring of 1943 the situation further improved because of increased local supply of fruits, vegetables, etc., but by the autumn the country was again threatened by serious shortages owing to the effects of a bad crop, guerrilla warfare and inflation. The amount of relief wheat was accordingly increased to 24,000 tons a month and of pulses, dried milk (of which 600 tons a month were imported) rice, fish, sugar, soup, spaghetti, etc. to 7200 tons a month. Moreover, sugar, pulses and potatoes have been imported from Germany.

With the increase in supplies, the distribution system was modified. A referendum among the population of Athens in November 1942 polled an overwhelming majority in favour of distribution through the ordinary channels of trade rather than by the communal soup kitchens. Consequently the activity of these kitchens was greatly reduced. Special feeding centres, however, were maintained for children showing clinical symptoms of undernourishment. In the winter 1943/1944 some 100,000 children obtained a full balanced meal a day, and in addition special infant centres distributed milk, semolina and cocoa to between 15 and 20 thousand infants under 2 years of age.

The population of the rest of Greece amounts to over five millions of which about 3 millions can be considered self-supporting. For the rest the relief plan proposes a) distribution of flour to non-producers; b) the establishment of people's kitchens to supply a

<sup>1</sup> The milling percentage of wheat fixed by the Commission was as high as 96; 1 kg. of flour should supply 1.4 kgs. of bread.

full meal a day to the most destitute, and c) the establishment of children's canteens.

The situation in Greece must still be considered critical; but the International Commission, in spite of its relatively small scope and resources, has been able to deal successfully with it and conditions would not, at present, appear to be worse than in certain other occupied areas.

Conditions in Poland are far from uniform but the average rations would seem to permit 1450 calories, more or less, per consumption unit a day. In addition it may be assumed that many derive some supplements from the black market. Poland, moreover, is normally more self-sufficient than Greece in that the farming population forms a greater portion of the total population. Jews are only allowed half as much under their rations as Poles, and unless they are able to supplement their rations by one means or another it is difficult to understand how they can survive for any considerable period of time. Rationing, in their case, appears to be rather a part of the policy of extermination than as an attempt to effect a fair distribution of restricted supplies.

In France and Northern Italy rations would seem to represent between 50 and 70% of requirements; in considering these figures, it should be kept in mind that on the one hand rations are not always available and on the other that the black market plays a not unimportant role. Conditions are therefore most critical among those of the urban population who cannot afford to utilize the black market. In the Baltic States, Slovakia, Belgium and Norway rationed calories constitute some 70% to 90% of requirements, but they are not always available, though on the other hand some persons are able to supplement their diet from the black market. In the Netherlands, Bulgaria, Finland, the Protectorate and Germany, as well as in Hungary and Roumania, there does not appear to exist any serious calorie deficiency. In Germany and Denmark, in fact the calorie intake was well up to, or even above, normal requirements.

Although in an analysis of wartime diet the first question naturally concerns its adequacy with respect to calories, it is essential also to consider its composition. In peacetime the majority of mankind existed on diets which in one or several respects fell short of what were considered desirable or optimum levels, and even in



Western Europe and North America, where calorie intake was on the whole ample, large sections of the population existed on diets short in high-grade proteins, and of certain vitamins and minerals; all present food deficiencies should not therefore be attributed to wartime conditions.<sup>1</sup>

*The Animal-Vegetable Ratio.* It is useful to consider first the balance between vegetable and animal food. The great staple foods—bread, potatoes and also sugar which for the sake of convenience may be included with the starch group, though it is nutritionally less valuable than the others in this group—are of vegetable origin. They are the cheapest sources of calories, and the poorer a country (or individual) and the more it has to economize in the use of land, the greater is the part of its diet derived from this source. For a number of vegetable calories are required to produce one calorie of animal food. This proportion differs among different animal products. It may require on an average some 5 primary calories to produce one calorie in the form of milk; 18 or more to produce one calorie in the form of beef or eggs. The higher the proportion of animal foods in a diet of a given calorie level, the greater is the number of primary vegetable calories required in its production. If, for instance, it is assumed that it takes on an average seven feed calories to produce one animal calorie for human consumption, the number of primary calories represented in a diet composed of 50% animal and 50% vegetable calories would then be  $(1500 + 7 \times 1500 =)$  12,000 calories. If the proportions were 10% and 90%, respectively, the number of primary calories required would be 4800 and, if all calories were of vegetable origin 3000.

In the poor countries of Eastern Asia, diets are almost exclusively of vegetable origin; as we proceed towards the richer countries the percentage of animal calories increases and it is in the United States and some countries of Northwestern Europe as high as 40% on an average. The richer countries thus had a reserve to fall back on. They could in case of need divert a part of their primary crops to human consumption by decreasing animal production. An additional reserve was constituted by the livestock itself.

<sup>1</sup> Moreover accepted standards contain a considerable margin of safety, and it should not be concluded that a diet which falls short of optimum requirements in certain respects is necessarily conducive to a rapid deterioration of health.

In countries, on the other hand, where the consumption of food of animal origin was very small, crop failures periodically resulted in famine.

According to estimates by J. H. Richter,<sup>1</sup> the continent of Europe produced, before the war, roughly 90% of its calorie food requirements. At the same time Richter estimates these requirements were met by calories of vegetable origin 78%, calories of animal origin 22%. These averages, of course, cover great national differences; the ratio in Germany was roughly 2 to 1, in Scandinavia about 3 to 2.

Mr. Richter estimates that the yearly supply of calories amounted to 995,000 billions of which 10% were imported either directly in the form of vegetable food for human consumption or in the form of animal foods and feeding stuffs. Of this total supply, 230,000 billion calories went to feed for draft animals, seed, losses and waste leaving 765,000 billion calories for human consumption; of these 270,000 billions were consumed by human beings in vegetable form; the rest was used to produce 75,500 billion animal calories for human consumption. If it is assumed that the amounts for seed, losses, waste and draft animals cannot be greatly reduced, the food reserve in terms of primary calories amounted to 495,000 billion calories—or little less than double the amount used for direct human consumption.

The first effect of the war was to cut off imports causing a decrease in the number of primary calories of some 10%. For some time this loss could be made good out from stocks of cereals and vegetable oils which had been accumulated in anticipation of war. These stocks were relatively soon used up, and the Continent depends at present on current production. The reduction of the supply of primary calories by 10%, however, was in view of the large reserve which the system of animal husbandry represented less serious than is generally realised. If the loss had been limited to this figure a relatively small change in the ratio between animal and vegetable production would have sufficed to maintain the human calorie consumption unchanged. If it required on an average 7 feed calories to produce 1 calorie of animal products for human consumption an increase of the vegetable ratio in the human diet

<sup>1</sup> *Continental Europe's Pre-War Food Balance*, U.S. Dept. of Agriculture *Foreign Agriculture*, August, 1942.

from 78 to 84 would have secured "self-sufficiency" at the old calorie-level.<sup>1</sup>

In reality, as has been shown in Chapter I, domestic crop production has also decreased and in consequence the change over to a more vegetarian diet has been much more radical. Diagram V below shows the ratio of vegetable calories in a typical working class family before the war and in the rations of a typical family in 1943.<sup>2</sup>

All over the continent (except in Bulgaria, and possibly Roumania and Hungary) the proportion of vegetable calories in the human diet has increased. The German authorities in charge of rationing have followed the natural course of decreasing the production of animal food, and using the primary crops for direct human consumption; but a not inconsiderable proportion of the rations, which varies from country to country, is still composed of foods of animal origin. In Germany the percentage of vegetable foods has increased from about 67 to 77: ratios not much lower than in Germany (74-76) are found in Finland, Netherlands, Norway, the Baltic States and France. For the Protectorate, Italy, Bulgaria and Belgium the figures are between 80-90. In Poland and, to judge from available data, in Greece, parts of Yugoslavia and Russia, over 90% of the diet is of vegetable origin.

The animal vegetable ratio cannot, however, be changed either very rapidly or beyond a certain point. Europe is short of fertilizers and, if animal manure were not available, crop yields would shrink drastically. Moreover, only a certain proportion of the land is suitable for the production of food for direct human consumption and some of the by-products obtained from the processing of food are most economically used as feeding stuffs.

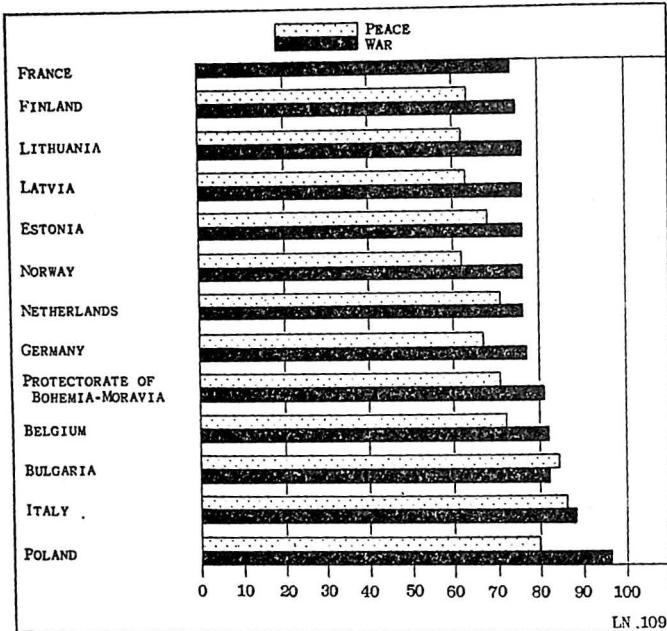
Nevertheless, the figures show that the reduction in animal consumption is uneven. It has been fairly well maintained in Germany, and in some of the more favoured areas in Northwestern and Northern Europe. In Germany the diet has been maintained ade-

<sup>1</sup> In fact, the actual change in the ratio could have been even less if the composition of the animal food group had been changed, and more of the animal foods (like milk) and less of the less economical (like eggs and beef) had been produced.

<sup>2</sup> In the calculation of these ratios vegetable foods have been supposed to include: bread, cereals, potatoes, sugar and half the fat rations, and animal food meat, milk, cheese, eggs and half the fat ration. In view of the low calorie content of fresh fruit and vegetables their exclusion does not materially affect the results.

## DIAGRAM V

PERCENTAGE OF VEGETABLE CALORIES IN THE DIET OF A PRE-WAR  
WORKING CLASS FAMILY AND A TYPICAL FAMILY  
IN THE AUTUMN OF 1943



quate in calories, at a vegetable ratio of roughly 77:23, which is about the same as for the Continent as a whole before the war. In all the occupied areas, the number of calories allowed for human consumption is smaller or the ratio of vegetable calories is higher or both.

But Germany imports considerable quantities of animal products from occupied Europe and thus lowers the diet in the areas from which these imports are derived not only by the amount of those imports but also by the amount of economy in primary calories that might be effected were vegetable substituted for animal production. No general estimate of what that economy might

amount to can be made, for the cycle of farming in most areas requires animals in order to produce crops as well as crops in order to produce animals.

*Composition of diets.* The main energy-giving constituents in the diet are carbohydrates and fats. In theory these are interchangeable as sources of energy, but in fact, fat must be a constituent of the normal diet, though in what proportion is not certain. Fats are the most highly condensed source of energy, and are of special importance to persons who perform heavy work or live in a cold climate and need a diet rich in calories. When fat consumption is too low morale and efficiency may be affected and a general feeling of discomfort—hidden hunger—be caused even if the total calorie intake is sufficient.

*Fats.* Fat purchased as such, however, represents only a part of total fat consumption—much is consumed in the form of milk, cheese, cream, meat, bacon, nuts, etc. Most of the foods containing fat have been rationed, and their fat content has been reduced. Hence, it is difficult to estimate the total fat in rationed diets, and the following figures of fats “purchased as such” understate the actual decrease in fat consumption.

FATS “PURCHASED AS SUCH”: RATIONS OF A  
TYPICAL FAMILY IN 1943

(calories per diem per consumption unit)

France	95	Protectorate	265
Belgium	165	Baltic States	275
Italy	120	Bulgaria	290
Netherlands	230	Norway	340
Finland	250	Germany	320

In North America and Europe dieticians tend to favour a diet furnishing from one-fourth to one-third of total calories in the form of fat. The lower figure would give a daily allowance of about 700 calories, though less should not necessarily be considered as insufficient. A large part of this allowance, however, is normally in the form of indirect consumption, and fats purchased as such rarely exceeded some 500 calories a day per consumption unit, and figures of 400 and less were not uncommon. The highest wartime consumption is found in Denmark, Germany, and Norway where rations allow some 300 calories or more per consumption unit.

Rations between 230 and 300 calories occur in Bulgaria, the Netherlands, Finland, the Protectorate and the Baltic States. These rations are considerably lower than in peacetime; but there is no direct evidence that they are physiologically insufficient, though probably below the level required for comfort. Rations in Italy, France, Belgium vary between 80 and 165 calories, and are so low that they must give rise to great discomfort. Indeed in many of the occupied areas the lack of fat is more keenly felt than all other shortages.

*Proteins.* Proteins are the main body building constituents in the diet, though they also generate energy. The question of what constitutes a satisfactory allowance is not easy to answer. The Health Organisation of the League of Nations states that: "In practice, the protein intake for all adults should not fall below 1 gramme of protein per kilogramme of body weight. The protein should be derived from a variety of sources, and it is desirable that a part of the protein should be of animal origin."<sup>1</sup> The requirements of growing children and pregnant and nursing mothers are considerably higher—amounting for children 1-3 years of age to as much as 3.5 grammes per kilogramme of body weight. The average adult male, however, requires, according to these standards, about a tenth of his normal calorie requirements (or roughly 300 calories a day) in the form of protein. But the generally accepted standards lean toward liberality as compared with actually demonstrated need, which according to some authorities only amounts to about half or some 150 calories a day.<sup>2</sup>

It is even more difficult to decide how large a portion of proteins should be in form of animal proteins. Large populations exist on almost completely vegetarian diets, and there appears to be little evidence to show that a temporary shortage of animal proteins, except in the form of milk for children, has a serious or lasting effect on health. The matter, however, is complicated by the fact that the nutritive value of proteins depends on the mixture of proteins contained in the diet. While animal proteins, and particularly those of milk and eggs, have a higher value than those sup-

<sup>1</sup> "Report on the Physiological Bases of Nutrition" drawn up by the Technical Commission of the Health Committee of the League of Nations, *Quarterly Bulletin of the Health Organisation of the League of Nations*, Vol. V, Extract No. 6.

<sup>2</sup> Cf. for instance, Sherman and Lanford, *Essentials of Nutrition*, New York, 1941, p. 103.

plied by cereals, and still more than those supplied by legumes, it is found that when grains and milk are fed together in suitable proportions, their proteins so supplement each other that the combination is practically as efficient as milk proteins alone. This supplementary relationship renders simple conclusions as to the value or adequacy of the proteins in different diets difficult to make.

Considering the total requirements of proteins, however, it is perhaps reasonable to assume that when proteins constitute between 5-10 per cent of the total calories in a diet adequate in calories, there is not likely to be any critical deficiency. When calorie intake is insufficient to maintain the energy equilibrium, the body uses proteins as fuel, and little would actually be gained by increasing the proportion of proteins in the diet.

Cereals, peas, beans and nuts, are good sources of proteins. Potatoes, on the other hand, are relatively poor in protein. One kilogramme of whole wheat bread contains 97 grammes, or about 390 calories of proteins, about 16% of the total calories contained in bread. One kilogramme of potatoes contains 20 grammes. As a general rule, when the rations of whole bread are adequate the minimum requirements of proteins are also met. Protein deficiency would seem to occur mainly in cases where the diet is composed to a large extent of potatoes and of vegetables other than peas and beans. There appears to be no evidence of any lack of proteins as a whole in Germany, the Protectorate, Bulgaria, Hungary, Roumania, the Netherlands and Norway. In other countries the protein deficiencies are similar to the calorie deficiencies, and the situation is capable of remedy only to the extent that total rations can be increased. Hence, the evidence regarding total protein-intake points to the conclusion that it cannot be divorced from the question of calorie-intake in general; it fluctuates with the general level of rations and where it is satisfactory, the proportion of proteins appears to meet, if not always optimum requirements, at least the level of demonstrated physiological requirements.

The question of the proportion of animal proteins in the diet is more difficult. Given an adequate supply of milk it is possible to compose diets of whole meals, fruits and vegetables that meet all known nutritional requirements; in fact the question of the adequacy of the diets turns largely around the milk supply. But it should not be overlooked that a drastic, or too rapid decrease in

meat consumption is met by considerable consumer resistance; such a decrease may—beside its physiological repercussions—depress the morale of the population; a common characteristic of most diets is increasing dullness and lack of variety which in turn may react on appetite, and indirectly on nutrition. Food must be digested and to be digested must be reasonably appetizing.

The table below shows the number of calories derived from the rations of the chief foods yielding animal proteins. Although the figures are subject to many reservations and a considerable margin of error, they are likely to give a correct expression of general trends. Consumption of meat and eggs has been drastically reduced; in many cases eggs have been almost eliminated from the ordinary diet, while cheese consumption has been curtailed to a varying degree. The most striking feature of the table is the extent to which milk consumption has been maintained and in some cases even increased. A larger proportion of animal foods is obtained now in the form of milk than before the war. In Germany the percentage has increased from 40 to 67 per cent; in Finland, which before the war had the highest known milk consumption per capita, the figure has gone up from 64 to 87 per cent. In the rest of Western and Northwestern Europe the percentage is now between 70 and more than 80; in Southern Europe, Poland, Greece and Yugoslavia, milk consumption has always been low; such information as is available points at extreme scarcity.

It is not possible to draw any hard and fast conclusions as to the adequacy of animal proteins in the diet from the table below. The figures suggest, however, that except in the very low consumption areas (Poland, Greece, Yugoslavia, occupied Russia) and probably in Italy, the diet contains sufficient milk to permit a healthy growth of children, when rations are actually available, and other requirements are met. It would hardly appear that the question of animal proteins is at the present particularly critical where total calorie intake is sufficient.

*Minerals.* Analysis of the contents of diets in mineral salts and vitamins present even greater difficulties. These elements are present in minute and varying quantities in different foods, and averages based on broad food groups mean little or nothing. Moreover, fresh vegetables and fruits which are rich sources of both vitamins and minerals are in many cases not at all or only partly rationed.



CALORIES DERIVED FROM MILK,\* CREAM, EGGS, CHEESE AND MEAT PER CONSUMPTION UNIT PER DIEM

	TOTAL CALORIES			CALORIES DERIVED FROM MILK					
				CALORIES			PERCENTAGE OF TOTAL		
	PRE-WAR	1942	1943	PRE-WAR	1942	1943	PRE-WAR	1942	1943
Finland	905	355	540	575	315	470	64	89	87
Netherlands	665	585	495	335	390	385	50	67	78
Germany	710	475	495	285	295	330	40	62	67
Norway	830	620	425	335	590	365	40	95	86
Estonia	885	—	410	380	—	295	43	—	72
Latvia	1100	—	410	480	—	295	44	—	72
Lithuania	1200	—	410	300	—	295	25	—	72
France	—	—	455	—	—	345	—	—	76
Belgium	705	430	400	260	295	295	37	69	74
Protectorate	630	530	355	275	390	260	44	74	73
Italy	205	140	145	50	—	30	24	—	21
Poland	530	75	55	145	—	—	27	—	—

\* Skimmed and whole.

Of the many mineral elements which are essential to the growth and functioning of a healthy body, nutritionists attach special importance to calcium, phosphorous and iron, the elements most frequently deficient in ordinary diets. Calcium and phosphorous are required for the bones and teeth, and soft tissue and both fulfill regulatory functions. Thus calcium regulates heart beat and aids in the clotting of blood.

The richest sources of calcium and phosphorous are milk, cheese, eggs, vegetables and fruit. An adult male requires a minimum of 0.45 grammes of calcium per day, but optimum intake is considerably higher, say 1 gramme. The Committee on Food and Nutrition of the American National Research Council recommends 0.8 grammes and relatively larger doses for children and pregnant mothers. Phosphorous requirements are at least 0.88 grammes per adult male and optimum standards about 50% higher. The daily optimum requirements of calcium for an adult male is thus contained in 830 grammes of milk, or 1500 grs. of oatmeal, or 300 grs. of broccoli leaves, or 2000 grs. of whole wheat. Adequate maintenance rations can be obtained from roughly half these quantities. Daily optimum requirements of phosphorous, 1.3 grs., is contained in 320 grs. whole cereals or in 1200 grs. broccoli flower buds. The richest normal source of calcium is milk and milk products, particularly cheese. Where milk consumption is maintained at some 400 grs. per consumption unit or more (corresponding to less than 300 calories) the minimum requirements (0.45 grs.) are covered. Milk and cheese rations fairly adequate to meet the minimum requirements would appear to be quite common in Europe, exceptions are Poland, Italy, and the other very low consumption areas. The actual intake is higher when the diet is rich in green vegetables and the minimum milling proportions for flour are high. In most countries on the continent vegetable consumption has increased and the milling percentage has been raised. The situation with respect to phosphorous would appear to be analogous; milk is a relatively less rich source but whole cereals are a richer source of phosphorous than of calcium. Iron, used in the formation of hemoglobin in the blood, is found in a great number of foods, and as deficiencies are easier to detect and remedy, they should not constitute so serious a danger as certain other deficiencies.

*Vitamins.* The situation with regard to vitamins is extremely difficult to appraise; not only are optimum standards generally high in relation to demonstrated need, but it is impossible to give, on the basis of available data, reliable estimates of actual content of the various vitamins in the diet.

Ascorbic acid, or vitamin C, is essential for the prevention of scurvy, for growth and maintenance of teeth and bones, and of the capillary walls. Good sources are fruits, berries, and vegetables, and potatoes cooked in their skins. Vegetable and potato consumption has increased relatively in most countries, and where the number of calories in the diet is adequate, the position as regards vitamin C may be less unfavourable than before the war; this is the case for instance in parts of Germany and Czechoslovakia. In Northern countries such as Norway where imports of many fruits can no longer be procured, and vegetables are scarce in winter, serious shortages may have developed. The same holds true of consumption in the low consumption areas, particularly in the towns, not only in Poland, but probably also in Belgium, the Netherlands, and France. To a certain extent these shortages have been counteracted by the distribution of ascorbic acid to children, as in Germany, and by the collection of such natural rich sources as rose hips and wild berries.

Thiamin (vitamin B or B<sub>1</sub>), the anti-beri-beri vitamin is essential for growth, the proper maintenance of appetite and digestion, and the efficient use of carbohydrates by the body. It is common in both animal and vegetable foods; whole bread and cereals, beans and peas are relatively rich sources, while bread made of white flour, and green vegetables and fruits are not nearly so rich. The general increase in the milling percentage has tended to increase the relative supply in the diet, and it does not appear that deficiency of this vitamin can be separated from the general problem of undernutrition and starvation. Where the diet is sufficient in calories the supply of vitamin B is probably, at any rate, not lower than before the war. Available information concerning deficiencies of many other water soluble vitamins such as riboflavin and niacin, is too scarce to permit general conclusions.

Vitamins A and its precursors, are important for growth, and the maintenance of health, particularly of the skin, of vision in semi-darkness and resistance to infection. The main sources of vitamin

Are milk, butter, eggs, fish liver oil, green vegetables and yellow vegetables such as carrots. Bread, muscle meat, fats (other than bacon) and potatoes are poor or negligible sources. In countries which rely largely on these staples there is risk of severe shortages unless consumption of vegetables and dairy products is maintained. In countries where vegetable production has been well maintained, as in Germany, and milk rations are fairly adequate, there is little reason to believe that deficiencies have increased since before the war, particularly as margarine is frequently fortified with vitamins A and D. In the countries, however, where diets are low in calories, it is to be assumed that intake falls below requirements. This, of course, holds particularly true of the urban centres during winter, when the supply of vegetables and dairy products is at a low ebb.

Vitamin D is essential for building and maintaining bones and teeth, for the utilisation of dietary calcium and phosphorous, and for the prevention of rickets. It may be formed in the body under the influence of ultra-violet rays in sunshine, and deficiencies are most likely to arise in countries with long sunless winters, especially in those of the northern countries where the diet is also short of milk, dairy products and fat fish. In Germany synthetic vitamin D is supplied free to infants.

*Summary of Conclusions.* Reviewing all the evidence, it is clear that food conditions differ greatly from country to country and from one consumer category to another. Farmers are not, as a rule, greatly affected by rationing, and food scarcities are greatest in the urban centres. Here actual consumption depends on (a) the size of the official ration; (b) the extent to which rations are made available in the shops; (c) the purchasing power of wages; and (d) additions from the black market. No numerical estimates of the last three factors are possible. But, except where the measures to render distribution more equitable are exceptionally complete and well administered, it is the lower income groups in the urban centres that suffer. Considering the official rations alone, however, certain conclusions as to the relative position of different countries seem possible.

The theoretical calorie intake appears up to pre-war levels in Denmark, Germany, Bulgaria, Roumania and Hungary; in most cases, and in Germany in particular, the intake is sufficiently high to meet the accepted average requirements of 3000 calories a day

per adult male. In the Protectorate, Belgium, Finland, the Netherlands and Norway, rations represent between 2500 and 2800 calories per adult male, which in most areas is lower than before the war; the national averages, however, cannot (on the basis of official rations) be considered critically short, though more or less severe shortages occur among special consumer groups. In the Baltic States, Slovakia, France and Italy, rations represent between 2400 and 1500 calories. Both physiological needs and peace time consumption were far from identical in these countries, but rationing is drastic in all cases. The average rations are too low to permit of full working efficiency and optimum health.

In Poland, Greece, parts of Yugoslavia, and by all indications occupied Russia, rations in 1942 were so low that actual famine was frequent. In 1943 the situation in these areas, except possibly occupied Russia for which information is lacking, conditions have recently improved. Still, levels of consumption are so low that many people, particularly in the towns, would appear to live in a state of semi-starvation.

But the absence of starvation does not imply that the diet is also adequate for maintaining health and efficiency. The trend during the last decade has been to assume that people in the Western world had, as a rule, sufficient calories and that the problem of real importance was to assure a consumption of foods rich in animal proteins, vitamins and minerals—in particular milk and milk products, eggs, meat, fruits and vegetables—sufficient to guarantee optimum health and efficiency. In wartime, however, the problem is to a large extent that of balancing quantity against quality. While malnutrition (in the sense of an insufficient intake of one or more of the elements essential to optimum health and well-being) can co-exist with a sufficient intake of calories, an insufficient intake of calories involves malnutrition as well. If a diet is too low in calories to maintain energy equilibrium, the body will use proteins as fuel, and the proportion of proteins of different grades, while important in the optimum diet, loses much of its significance. Hence, the immediate problem of calorie deficiencies tends to overshadow the problem of adequacy in other respects.

In the first groups of countries, particularly in Denmark and Germany, the war diet contains more vegetable foods than was customary before the war. Since, however, milk consumption has

been fairly well maintained—at least for children—this change should not by itself be taken as a sign of a deterioration of the nutritive value of the diet. The German diet contains less meat and meat products than before, and certainly less than what is consistent with a palatable and varied diet; it contains also less fat, and fat shortages and the shortage of animal proteins, constitutes a serious social problem. There seems to be no reason to believe, however, in view of the increased intake of vegetables, potatoes and whole bread, and the fortification of margarine with vitamins A and D (together with special distribution of vitamin and mineral preparations to children) that the diet is necessarily poorer in essential minerals and vitamins than before the war.

In the second group of countries (the Protectorate, Finland, the Netherlands and Norway) the composition of the diet is not significantly different from that in Germany. Owing, however, to the lower calorie intake (and the less regular distribution of rations) deficiencies in particular elements in the diet are likely to be aggravated. For instance, the lack of vitamin C in parts of Norway is serious.

In the third group of countries (Belgium, the Baltic States, Slovakia, France and Italy) the problem of quality is progressively overshadowed by the problem of calories. Except for the Baltic States, milk consumption is lower and meat rare or non-available. Much of the vegetable and fruit crop is exported to Germany and the diet is monotonous. Even if the *proportion* in the diet of various elements may, on paper, seem fairly satisfactory, absolute scarcities exist to a large extent, particularly of fats, proteins, and probably vitamins.

The diet in the fourth, the very low consumption group is deficient in almost all respects, though international relief to Greece has improved conditions there and rations in Poland have been increased. In fact, until the primary calorie needs are again more nearly adequate, the question of the composition of the diet is subordinated to that of calories.

## II. *The United Kingdom and the European Neutrals*

The situation in this group of countries, excepting Spain, is throughout more favourable than in Germany and the German-dominated Europe. The war has naturally, as described in *Wartime*

*Rationing and Consumption*, brought about a considerable tightening in the supply situation; in the case of the United Kingdom this is caused chiefly by the necessity of husbanding shipping space required for imports; in the case of Sweden and Switzerland the continental blockade has reduced imports to a fraction of peacetime requirements. Nevertheless, in spite of these difficulties the over-all situation is less strained than on the German-dominated Continent, and leaves room for more flexible systems of rationing than in Germany. The British system has developed on lines different from those in other countries and it is useful to deal separately with the situation in this and the other countries in this group.

While the German system is highly differentiated, and rigid, the British system is characterized by less differentiation and more flexibility and freedom of individual choice. Britain has succeeded in maintaining an adequate supply of calories of vegetable origin for human consumption. Some vegetables and fruit are scarce or almost non-available, but all consumers have been free at all times to buy as much bread and potatoes as they required. Price control and wage policies have placed these items within the reach of the population as a whole. There has thus never been rationing of the total calories consumed, and each individual has the opportunity—as distinct from the totally rationed populations on the Continent—to consume as many calories as his individual requirements indicate.

An attempt to estimate the number of calories consumed is then without direct interest here. It is known that average intake is at or above the standard of 3000 calories per consumption unit a day.

While the purpose has been to maintain a diet adequate in all essential nutritive elements, this end could only be achieved with the greatest possible economy of means, and foods requiring more shipping space, land and labor have been reduced in favour of those requiring less. The ratio between vegetable and animal foods has been but little disturbed. Consumption of meat, eggs, etc., has been compressed and of milk encouraged, and milk consumption is now higher than before the war. The percentage of animal calories derived from milk would appear to have increased roughly from 23 to 39%.

Rationing is concerned mainly with protein foods, milk and fats. The need for these foods varies less between different groups than

does the need for other nutritive elements, and it has been possible to adopt a system of relatively undifferentiated individual rations. Meat, bacon, cheese, fats, sugar and jam are specifically rationed in definite quantities per head, and these rations are considered adequate to meet average physiological requirements. The supply of vitamins and minerals has been improved by the introduction of whole bread, the use of more vegetables, and the fortification of margarine with vitamins. Nevertheless it is recognized that an over-all per capita rationing is not capable of taking into account all special nutritional requirements which have been met by various schemes superimposed, as it were, on the basic system. The most important of these schemes are:

(1) *Communal feeding.* While on the Continent workers engaged in heavy or night work receive extra individual rations of certain foods—and in Germany workers have to surrender coupons to obtain meals at industrial canteens—Great Britain has adopted the policy of leaving needed or useful additions to the diet outside the ration. Communal feeding takes the following chief forms: (a) Industrial canteens in factories and at the docks and mines; (b) school canteens for school children; (c) British restaurants for the public.

Industrial canteens were introduced early in the war. Employers who employ 250 persons or more are required to operate them in their establishments; but even smaller employers can be required to set up canteens where special circumstances make it desirable. In some cases a number of smaller firms pool their resources and operate a single canteen. In other cases the workers have the use of near-by British restaurants.

Some school canteens were in operation before the war, but their number has been greatly expanded and it is the policy to supply all school children with one well balanced meal a day. The Board of Education pays a minimum of 70% and a maximum of 95% of the cost to local authorities supplying these meals. In case of need they are supplied to the children at reduced cost or free.

British restaurants have been sponsored by the Ministry of Food with the assistance of the local authorities. They arose originally as an emergency programme, but have gradually taken a firm hold and become a fixed part of wartime living. The object of British restaurants is to serve a hot, nutritious meal at about 1/- a head



—which is a price within the reach of every worker. These restaurants are open to the general public, but many local authorities give priority to workers during the rush hours. By the end of 1942 1800 British Restaurants were in operation; and plans had been approved by the Ministry of Food for several hundred more. It has been the policy of the Ministry to encourage their establishment in areas where there are many small factories without independent canteens.

The Ministry of Food grants the canteens and the British Restaurants the supplies necessary to provide the right kind of meals. School canteens are registered as priority catering establishments and receive such special allowances as are required. Canteens and catering establishments feeding industrial workers likewise receive higher allowances of rationed foods than ordinary cafés, hotels and restaurants. They are classified in two categories, the first catering to heavy workers, the second to ordinary workers. The first receive a meat allowance double that of ordinary establishments, the second one and a half times as much. Increased allowances of sugar, butter, marmalade, margarine, cooking fat, cheese and preserves are granted to both categories, and to the British Restaurants, which are entitled to priority supplies of unrationed foods such as cake, cocoa powder, starch, food powders, coffee essence and shredded suets.<sup>1</sup>

(2) *Distribution schemes.* Children of pre-school age—as well as nursing and pregnant mothers—do not generally benefit from the communal feeding. These categories of consumers have special need of foods rich in first class proteins, minerals and vitamins. Their needs are met through special schemes for the distribution of protective foods, namely milk, eggs and certain fruit and fruit juices for which special ration cards are given. The best-known and most important of these schemes relates to milk. Children under one year of age have a priority right to two pints of milk a day, and nursing or expectant mothers and children 2-5 years of age of 1 pint a day at 2 d. a pint. The milk is supplied free if the

<sup>1</sup> The feeding of miners presents certain difficulties, but much progress has been made in providing pit head canteens at the larger, and "Snack Bars" at the smaller mines. The programme for feeding miners envisages the setting up of 856 canteens to provide meals for 680,500 men, or 98% of all miners in the country. Seamen and certain classes of fishermen obtain rations on the liberal scale laid down in the Merchant Shipping Act.

parents' income falls below a certain minimum. Children of school age receive milk under the "milk in schools" scheme inaugurated before the war; this system has been extended to include, in principle, all school children. The ration of non-priority consumers varies with the season of the year; in winter the allocation has varied between 2 and 3 pints weekly. The total milk production in Great Britain was not inconsiderably higher than before the war. In the case of eggs priority consumers receive 4 times as many as ordinary consumers, and the price is kept down by means of subsidies. In addition children receive through welfare and maternity clinics certain quantities of fish liver oil and fruit juices.

(3) *Point rationing.* A third means of directing the distribution of a number of foods, which are desirable, but not essential additions to the basic diet, is the "point rationing scheme." It is employed particularly in the case of commodities the supply of which is too small, or too erratic, to permit of specific rationing. Each consumer receives a card containing a certain number of points, and the commodities are "priced" not only in ordinary currency but also in points. At present tinned meat, fish and beans, for instance, are under point rationing. The system renders it possible to include or exclude foods as the situation demands, and through the double mechanism of price and point changes demand can be steered in the direction desired. At the same time, the system leaves a considerable latitude of choice to the consumer.

The improvement in the British diet during the last year is due, not to changes in the basic rations, but to a more liberal allotment of foods through the various schemes just discussed, and the point system in particular. By an empirical use of point and price changes the Ministry of Food has been able to introduce and popularise food items—often obtained through lend-lease—which were previously unknown to the British public or in little demand.

It would be little use to lay down a theoretically perfect system of rationing, if a part of the population did not possess the income necessary to purchase the legal rations. The British system, therefore, which aims at establishing a minimum diet for all, requires an intimate coordination with price policy and social policy in general. We have mentioned above the milk distribution scheme and the system of school lunches, distribution of fruit juices, etc., designed to provide essential foods to special categories of consumers; the

canteens and British Restaurants are also designed to be within the reach of all. But, in fact, the policy goes farther than this. The Ministry of Food has virtual monopoly powers over the distribution of all imported and most home-grown foods. It fixes the price of foods to the consumer according to considerations of social policy. Prices have been stabilized at low levels, and the difference between the cost of production and/or imports is met by the Treasury from subsidies or by profits earned on the sale of other foods.

The rationing systems in Sweden and Switzerland are in theory based on the German pattern of specific rationing; but both countries in practising the social policy of more equitable distribution have introduced interesting modifications and developments of the original. In Sweden non-rationed milk and potatoes permit the population to satisfy in a nutritionally favourable manner their extra requirements for calories.<sup>1</sup> In Switzerland potatoes are free, and in combination with the system of flexible individual rationing discussed below, individuals seem to have the possibility of satisfying in full their needs for calories. Rationing in both countries is partial, and all evidence points to the conclusion that the population in practice reaches or even exceeds the three thousand calorie standard per adult male.

While the diets are thus quantitatively satisfactory, rationing has naturally imposed changes in their composition. The important ratio between animal and vegetable food in the diet was in Sweden before the war 41:59; it would not appear that it has changed greatly during the war. A rough calculation would place the present ratio at 39:61. Simultaneously, however, the composition of the animal group has been modified in both Sweden and Switzerland. The consumption of meat has decreased relatively to that of milk. Rough calculations would indicate that the percentage of animal calories derived from milk has increased from 36 to 56 in Sweden, and from 47 to about 60 in Switzerland.

In order to achieve an equitable distribution (that is, rations proportionate to requirements) Sweden has greatly extended the number of consumer categories, which at the present time would

<sup>1</sup> In February, 1944, rationing was further eased. Mutton and cream were unrationed and bread and other cereals can now be had without cards in restaurants and on trains. Milk consumption during the first half of 1943 was almost double of that for the corresponding period of 1939. Production of butter and cheese, however, had decreased, butter by 14% and cheese by 66%.

appear to have reached about 50. By a simultaneous policy of price-control, subsidies, and rebates, the country is, in fact, achieving the same general purpose as Great Britain in securing for its whole population the elements of sound nutrition. In Switzerland, since the summer of 1943, consumers have the choice between two alternative rationing plans: A and B. It was found that the poorer section of the people could not always afford to buy their full rations of the more expensive foods, and plan B, containing relatively more cheap foods, but of the same nutritive value, was devised as an alternative to plan A. Card B contains larger rations of bread, cereals, milk, and cheese, no meat, and smaller fat rations. Moreover, coupons for certain foods may be substituted, at officially fixed rates of exchange, for coupons of other foods. Thus, 250 points of meat gives the holder the right to 100 grammes of cheese or 100 grammes of peas, beans, etc.; 100 grammes of butter may be purchased or 200 grammes of cheese; and 1 litre of milk or 100 grammes of cheese. The right of exchange invests the specific rationing system with some of the flexibility otherwise characteristic of the point rationing system, and tends to limit the need for further differentiation by consumer category.

Conditions in Ireland and Portugal have not necessitated the rationing of more than a few foods which are generally imported. The situation in Spain, on the other hand, though it has improved, is still one of scarcity. Bread rations are small, varying inversely with income, between 1050 grammes and 1750 grammes a person a week, and sugar rations are insignificant—45 grammes a week. Milk, cheese, and eggs are not rationed; but a number of other foods are rationed locally. It is not possible to estimate the average diet either in calories or by nutritional value; but conditions, by all indications, are uneven, and even though they have improved during the last year, the aftermath of the Civil War, rather than the present war, makes itself felt in widespread malnutrition and in some areas among some classes in semi-starvation.

### III. *Consumption in Other Parts of the World*

The Americas, New Zealand and Australia have not been confronted during the war with any general food shortage. If some foods have been rationed, the reasons are different from those applying to Europe. The need for rationing in the United States

has arisen in spite of increased production on account of fuller employment and the higher earnings of the employed persons, coupled with the demands of the armed forces and lend-lease. In order to prevent a rise in the price of animal products and an undue expansion of animal production, meats, butter, cheese and fats have been rationed as well as certain products which, for one reason or another, happened to be in short supply. Thus, sugar was the first food to be rationed; canned goods were also rationed, not because of scarcities of the canned food materials, but to relieve pressure on the canning industry and to safeguard the needs of the armed forces and lend-lease. Coffee was also rationed in order to save shipping during the height of the submarine campaign but since July, 1943 has been free. As there has been no need to ration energy foods, fresh fruit and vegetables, or fluid milk, the free food-stuffs are enough to secure for everybody the chief elements of a sound nutrition. Fats (including butter), cheese, meat and meat products have been rationed by the "point" system as a single group. The adoption of the point system on such a wide basis keeps down total demand for these foods, while hardly interfering with the free individual choice. Each family can arrange purchases to suit its own needs, tastes and preferences. The system possesses also some of the chief advantages of differential rationing. While in a system of complete and specific rationing the number of calories obtainable by each individual is determined by the rations, the American consumer has the possibility of increasing or decreasing the calories he obtains from rationed foods. He may consume margarine, which is cheap in terms of points, instead of butter, cuts of meat which require fewer points instead of steak and so on.

As long as fresh commodities are not rationed, the rationing of canned goods does not necessarily limit consumption of the commodities in question although indirectly it may affect the quantities consumed. Some people, particularly in wintertime, may find it difficult to buy, or to prepare the equivalent quantities of fresh fruit or vegetables. Considered as a whole, however, food rationing in the United States does not compress ordinary food standards; it has not even significantly changed the ratio between animal and vegetable food in the national diet—the proportion having remained fairly stable at about 40:60. The rations are thus mainly a

means for rendering the general controls over production and prices more effective.

In Canada food rationing covers sugar (including jam, etc.), meat, fats and tea and coffee together. The rations are generous, particularly of meat; according to the cuts chosen, consumers may buy 455 to 1135 grammes<sup>1</sup> of meat a week, and on February 9th, 1944, the Minister of Finance, Mr. T. L. Isley, announced in the House of Commons that the situation now permitted that consideration be given to the discontinuance of meat rationing and the "meatless Tuesdays."<sup>2</sup>

In Australia sugar, tea, meat, and fats are subject to rationing. Rations here also are generous: for meat on an average about 1250 grammes a week, and for sugar 455 grammes. In New Zealand tea and sugar are rationed and meat became rationed on March 6th, 1944, at 1 sh. 9 d. to 2 sh. per person a week.

In all these countries rationing serves, in principle, the same general purposes as in the United States. It is so restricted in scope and so generous as to interfere little, if at all, with the satisfaction of ordinary nutritional requirements.

*The Middle East.* Conditions in the Middle East vary much from country to country. The first concern of the Governments has been to control supplies and prices of the bread grains, which constitute the mainstay in the diets of these areas. The measures adopted have met with a fair degree of success, and since supplies have become increasingly assured, Governments are more concerned with the problems of controlling distribution.

The conditions of the areas affected, however, are so different, and often so primitive, that it has proved impracticable to adopt uniform systems of rationing. Not only are statistics of population, crops and stocks generally little developed, but large parts of the population are illiterate, nomadic or living under the conditions of a primitive agricultural economy. The administrative machinery had in many instances to be created from the bottom. In the Sudan, for instance, rationing of consumers is on a household basis, by individual commodities; in Palestine, point rationing was preferred because its elasticity rendered it suitable to a country with mixed populations having different needs and consumption habits. In

<sup>1</sup> 1 to 2.5 lbs.

<sup>2</sup> *New York Times*, February 10, 1944. Meat rationing was suspended in March.

Cyprus a mixture of specific rationing and point rationing is preferred. The material available on actual rations does not permit a systematic study or analysis. A few examples, however, are quoted in the table below:

RATIONS OF SELECTED FOODS IN GRAMMES PER WEEK  
PER CAPITA IN 1943

	<i>Bread</i>	<i>Rice</i>	<i>Flour</i>	<i>Sugar</i>	<i>Oil</i> <i>(incl. fats)</i>
Tripolitania	1260	100	125	100	100
Iraq	—	2320	—	150/175	—
Iran	—	—	—	115	—
Eritrea	2310 <sup>1</sup>	—	—	185	230
Cyrenaica	—	500	1000	200	200
Syria and Lebanon (towns)	3000	—	—	230	—
Transjordan	—	175	—	175	—

<sup>1</sup> Includes 700 grammes of pasta = 910 grammes of bread.

In Palestine, the cultural, social, and economic differences between population groups has rendered a uniform scheme of rationing impracticable, and the great differentiation in rationing in this relatively small area affords a good illustration of the administrative problems to be overcome in introducing consumer rationing in Eastern and Middle-Eastern areas in general.

All persons are subject to rationing, but the larger urban areas, comprising approximately 650,000 people, are rationed according to the "point system," while the rest are on a straight allocation to each town, village, and settlement. Both systems are correlated in respect to the quantities of foods allowed.

The table below gives a list of commodities rationed in June, 1943, and shows average quantities consumed in areas under the point system, and actual consumption per head in the rest of the country.

*The Far East.* Conditions in China and India have already as far as supply is concerned been described in Chapter I and as shown above, recent news from India indicates that the crisis in the food situation had passed by the end of 1943, and that conditions are now rapidly improving. The price of food grains fell in the open market below government ceiling prices as private hoards

RATIONS IN PALESTINE IN JUNE 1943 AND CONSUMPTION 1937-1939

(Grammes per head per week)<sup>1</sup>

COMMODITY	ALLOCATION SYSTEM				POINT SYSTEM	SPECIAL ISSUES— (ALL AREAS)	AVERAGE (ALL AREAS)	
	ARAB AREAS		JEWISH AREAS		LARGER URBAN AREAS		1943	1937/39
	VILLAGES	SEMI-URBAN AREAS	VILLAGES	SEMI-URBAN AREAS				
Flour	1745	1745	1745	1745	1625	85	1715	1980
Sugar	70	140	140	140	275	25	185	350
Macaroni	—	—	45	45	25	1.4	15	10
Margarine	—	10	45	45	75	3.9	35	20
Edible Oil	—	20	140	140	125	5	60	125
Jam	—	10	40	40	35	2.1	20	15
Tea	.46	1.4	1.8	1.8	1.4	.23	1.4	3.2
Coffee	10	15	10	10	20	2.3	15	25
Cocoa	—	—	—	—	1.4	.23	.69	3
Halawa	10	10	5	5	25	.23	15	10
Meat, Beef		3.9			20	3.9	6.9	140
Meat, Mutton		6.9			17.9	6.9	5	175

<sup>1</sup> Monthly ration divided by a coefficient of 4.3.



were disgorged. Estimates of the 1944 Bengal rice crop place it as high as 10,000,000 tons, well up to the normal crop of some 8,000,000 tons.<sup>1</sup> This improvement, however, was not achieved without the introduction of a number of measures intended to coordinate the activities of the provincial governments. The policy adopted by the Central Government is that recommended by the Food Grains Policy Committee, reporting in the summer of 1943, and an all-India Food Conference held at New Delhi October 13-16, 1943, reached the following decisions: The Government of India should prepare a basic food plan. The first stage was to come into effect already in November 1943, and early in 1944 it was to be put on a more permanent basis.<sup>2</sup> Decision with respect to policy will ultimately rest with the central government. Procurement, however, will be carried out by local government agencies but under general central supervision. Requisitioning may be used with caution and competitive purchases are to be eliminated. For all major grains there will ultimately be initiated statutory price control on a provincial and regional basis. Rationing of food grains should be established in towns with a population of 100,000 or more. Cereal rations should in principle not fall below 1 pound per adult a day. Rationing of sugar and milk should also be considered.

Statistics for China are more than difficult to obtain, but due to lack of an adequate system of communications, food supplies naturally vary both in time and from place to place. The Chinese population like the Indian exists close to the minimum of existence and relatively small disturbances are capable of causing local famines of considerable magnitude. The monetary inflation affects adversely large sections of the population, particularly in the towns. No information is available on conditions in the provinces occupied by Japanese.

<sup>1</sup> "Indian Affairs," Vol. II, No. 25, London, December, 1943.

<sup>2</sup> The formula suggested in calculating future requirements is as follows: "Normal consumption requirements should be taken as the average of the estimated harvests of all food-grains over a five-year period ending 31st March, 1942, plus the imports and minus the exports of the same period. Surpluses and deficits should be calculated on the basis of normal consumption thus determined and compared with the estimates of the forthcoming years, or half-year's production of all food grains." *India. (Food Situation, 1943)* p. 27.

## CHAPTER II

### NUTRITION AND HEALTH

A STUDY of wartime nutrition would be incomplete without some reference to public health. In the foregoing chapter, diets were compared with theoretical standard requirements; but the final test of the adequacy or inadequacy of a diet lies not in its more or less close conformity with theoretical standards but in its effect on health and efficiency. It must be remembered, however, that diet is far from being the only factor to be taken into account. Housing conditions have deteriorated. New residential construction has been suspended and dwellings have been extensively destroyed or damaged by aerial bombardment and land warfare. Some urban areas have been evacuated, while others have attracted large numbers of refugees or of workers in expanding war industries. Lack of fuel is common, and cold is in many countries almost as great a hazard to health as malnutrition. Hygienic and sanitary conditions have also grown worse. Soap and hot water have in many places become rare luxuries. Hospitals, doctors and nurses have been mobilized for war, and the civilian population have to get along with less medical services, and in many cases, with less medicines and drugs, or go without.

While living conditions have generally undergone a drastic change for the worse, the amount of work required of the individual has grown. The hours of work have been lengthened, and housewives, even if they do not work outside the home, have to spend more time in procuring and preparing the family meals. Fatigue and overwork have naturally increased. To these more or less tangible factors must be added less tangible but no less important factors of a psychological order. There is first the daily strain of the war itself and of the war effort. In many, perhaps most families, is the deep-seated worry over the fate of relatives and friends in the armed forces or on forced labour abroad, and ever present in many districts the fear of aerial bombardment. In the occupied areas the presence of the enemy and the constant threat of the police constitute a daily strain on the nerves. For these and other reasons it can not be assumed that the relation between health and

diet is a simple one; that relationship is in practice extremely difficult to determine.

The available measures of health are negative in character, relating to morbidity and mortality rather than directly to health itself, and the statistics of morbidity must be interpreted with care. To be truly significant they should cover all serious illnesses. Some, perhaps most illnesses, increase in frequency and severity during wartime; but it has been observed that others, such as diabetes and certain nervous diseases, decrease. Single diseases are not representative of the general condition of health; and it is particularly dangerous to form general judgments based on those epidemic diseases—meningitis, typhus, diphtheria, etc.—the incidence of which in peace-time is relatively light and varies widely from year to year. Moreover, as has been said above, the nutritional standards differ within one and the same country. The greatest malnutrition is, as a rule, found among the poor in the industrial centres. Obviously, statistics which relate to isolated towns or city hospitals, while representative of conditions in these areas, are most unlikely to be representative of average conditions in the country as a whole. Morbidity statistics should, insofar as possible, be national in scope.

In view of all these difficulties, it is not possible to give anything like a detailed picture of the effect of malnutrition on health in Europe today. In this chapter, we shall not attempt more than to select a few illustrations of certain tendencies in certain areas.

Quantitatively the most serious symptom of malnutrition is probably tuberculosis. Morbidity and mortality from this cause has shown a general increase in the belligerent and occupied countries, particularly in the low consumption areas. Tuberculosis is also reported to be not only more widespread, but more acute, and frequently to develop into a type of broncho-pneumonia. In Belgium, for instance, the number of advanced cases of tuberculosis was 70,000 in December, 1941, and 110,000 in February, 1943. In 1939 five out of every 100 deaths were due to tuberculosis; in 1942 the figure was 6.5. In France tuberculosis mortality is estimated to have increased by 50%; in Paris the death rate per 100,000 inhabitants was 168 in 1940 and 234 in 1942. The incidence is particularly heavy among adolescents and young people.

Among the epidemic diseases, diphtheria has perhaps shown the most general increase. In Norway some 15,000 cases were reported for 1943, and in Holland they increased from 1,730 in 1940 to 19,407 in 1942. A similar picture is offered by scarletina. The number of cases of bacillary dysentery and typhoid fever have also gone up; but these diseases were relatively rare before the war and, so far, serious epidemics have not occurred. The same is true of cholera and meningitis; no influenza epidemics of the 1918 type have occurred, in spite of local outbreaks in some countries. In Greece, as an aftermath of the 1941/42 famine, the resistance of the population was greatly weakened, and malaria has increased catastrophically and tuberculosis, also, very severely.

The prevalence of specific deficiency diseases is difficult to determine statistically. Almost all over Europe a loss of body weight is noted among adults, and cases of retarded growth amongst children have been reported in many areas. The loss of body weight may be partly connected with the nervous tension and increased activity discussed above, but it should be remembered that the wartime diet is, at the best, dull, and that even if unlimited quantities of bulky foods, such as potatoes and turnips, are available, appetite forms a limiting factor in their consumption. In Norway losses of weight up to 40-50 lbs. are not uncommon. "Investigations undertaken during the last two years among factory workers in Oslo and other places (in Norway) show beside the general loss of weight some characteristic symptoms in 80-95% of the persons examined, namely: constant feeling of hunger, weakness, tiredness, reduced working capacity and endurance, increased need of sleep. . . . The same thing is found among the forestry workers, who on the present inadequate rations are able to work only 3-4 days a week."<sup>1</sup> These symptoms, to larger or smaller degree, are typical of most occupied countries. Even more serious, however, than loss of weight amongst adults is the retarded growth of children and adolescents. The weight of new-born babies is below normal—in Belgium at one year usually by about 1 kg.<sup>2</sup> The deficiencies are par-

<sup>1</sup> *Statement on Health Conditions and Health Problems in Norway*, by Dr. O. Galtung Hansen. Presented to the Atlantic City Conference—(Reception No:225, symbol: I/F/4.2/No. 19).

<sup>2</sup> *Food and Health Conditions in Occupied Belgium* by Dr. E. Bigwood, in a report presented to the Atlantic City Conference (Reception No:269, symbol: L/F/4.2/No. 23).

ticularly serious among adolescents, whose calorie rations, in terms of need, are smaller than those of most other groups.

Hunger oedema, practically unknown before the war, has made its appearance in the occupied areas, and there is an increase in rickets. Gastro-intestinal troubles due to vitamin B<sub>1</sub> deficiency, and cases of scurvy have occurred in a large number of countries.

As pointed out above, however, the statistics of specific illnesses do not give a balanced picture of the national situation. But in the long run, changes in morbidity and health are reflected in mortality rates. How rapidly the strain of war will affect those rates depends on a multiplicity of factors; it is probable that it will continue to exercise an influence for some years after the termination of hostilities. Mortality statistics relating to the war years therefore fail to tell the whole story.

Diagram I shows the number of deaths per thousand civilian inhabitants in 1938 and 1942 (in some cases, 1941) for those countries for which the information is available.

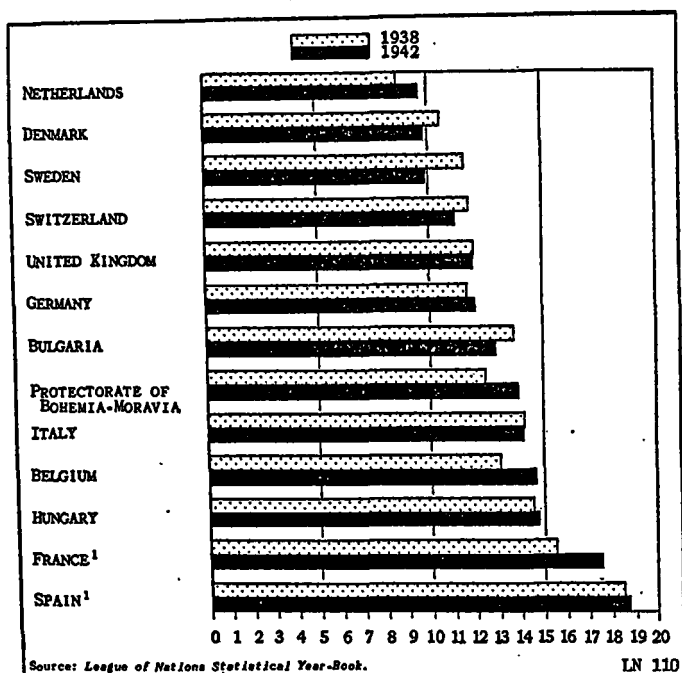
In considering this diagram it is necessary to bear in mind that the figures relate to civilian population only. In those countries, therefore, in which large numbers of persons are in the armed forces, a reduction in the number of deaths would occur if the specific death rates remained unchanged.

Recent demographic data are lacking for Norway and most of the Eastern European and Balkan countries. Norway, however, had one of the lowest death rates (10<sup>0</sup>/<sub>00</sub>) in 1938, while it was 13.8<sup>0</sup>/<sub>00</sub> in Poland, 13.3<sup>0</sup>/<sub>00</sub> in Greece and 15.6<sup>0</sup>/<sub>00</sub> in Yugoslavia. The figures for 1941 and 1942 do not show any significant changes in the comparative levels of mortality in the countries included in the diagram, though, of course, certain changes have occurred. Thus it should be noted that mortality has decreased or remained stationary not only in the United Kingdom, Sweden, and Switzerland, but also in Denmark and Bulgaria. It has increased slightly in Italy, Germany, the Netherlands (where the pre-war level was exceptionally low), Hungary, and Spain. In the latter country, owing partly to the civil war, the level in 1938 was already high. The increase in the Protectorate, Belgium and France is more marked.

Data are available relating to deaths in the Athens-Pireus area but are believed to understate the actual death rate. According to

## DIAGRAM I

CIVILIAN DEATHS PER THOUSAND INHABITANTS IN SELECTED COUNTRIES IN 1938 AND 1942 (1941)

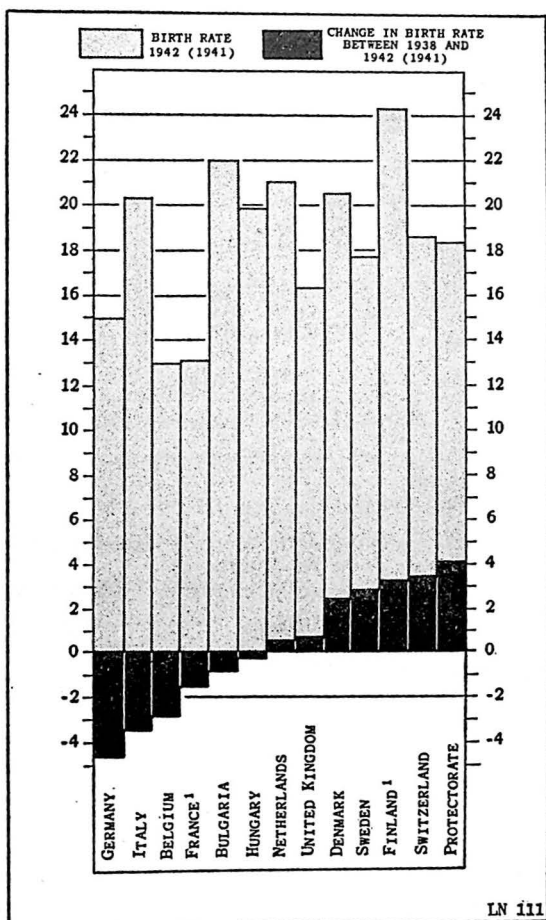


<sup>1</sup> France, Spain: 1941.

these figures deaths increased from a normal rate of about 900 persons per month to 1700 in September, and, during the period of serious famine, up to 6600 in December 1941 and January 1942. In September 1942 the number had gone down to about 2250 and continued to show a falling tendency until in March 1943 it reached 898—about the normal figure. In Poland mortality has reached appalling heights among the Jews and non-favoured city groups, but Poland is more self-sufficient than Greece, and the peasant population, which is less affected than the city population, forms a greater part of the total.

## DIAGRAM II

BIRTHS IN 1942 (1941) PER THOUSAND OF THE POPULATION IN SELECTED COUNTRIES AND NET DECREASE (-) OR NET INCREASE (+) IN THIS RATE SINCE 1938



<sup>1</sup> Finland, France: 1941.

The development in 1943 can not yet be adequately gauged, but statistics for the first nine months of 1943 for Germany shows the number of deaths to be 725 thousand as compared with 746 for the corresponding period in 1942. In Belgium the monthly number of deaths was 9,156 in 1938, 10,054 in 1942; in December 1942 it was 10,872, and in January and February 1943, 11,432 and 9,557 respectively.

It is well known that during the generations before the war births exhibited a falling trend in practically all the countries of Western civilization. In many cases, the fall had gone so far that the populations did not reproduce themselves, each succeeding generation being numerically feebler than the preceding one. If actual numbers of population were generally still increasing, this was due to the lower number of deaths and the prolongation of the expectation of life. The population question had become one that engaged the attention of governments more and more, and policies had in many countries been instituted to increase birth rates.

It would be expected that the war would have accentuated the decline in births, especially since a great number of the adult male population was absent from their families. In fact, births, in a number of countries, have increased during the war. This holds true not only of the United States and Canada, but also of the United Kingdom, Sweden, New Zealand, and such occupied areas as the Netherlands, Denmark, and the Protectorate.<sup>1</sup>

But Germany, which more than any other country had carried out a positive population policy before the war, showed the opposite trend. By a series of measures the Nazi Government had succeeded in lifting it from an average of 16.6<sup>0</sup>/<sub>00</sub> for the five-year period 1931/35 to 20.4<sup>0</sup>/<sub>00</sub> in 1939. A slight decrease was registered in 1940, and by 1942 births had fallen to 14.9<sup>0</sup>/<sub>00</sub>. Births likewise declined in Italy, Belgium, France, Bulgaria, and Roumania, but in most cases by less than in Germany.

While nativity is indirectly a measure of health, in the sense that it falls in a population that is deprived of the essentials of living, its development is of a more direct interest in its relation to the death rate and its fluctuations. It is well known that the frequency of deaths is greatest in the first year of life. Even a moderate change in the birth rate, therefore, has an appreciable influence on the

<sup>1</sup> The birth rate in the Netherlands during the first three quarters of 1943 was 22.9<sup>0</sup>/<sub>00</sub> as compared with 21.3<sup>0</sup>/<sub>00</sub> during the corresponding period in 1942.



general death rate. In fact, during the first World War births generally declined, and the general death rates were lower than if births had remained constant; the crude rates, therefore, give an unwarrantedly favourable picture of the specific mortality—and thus, indirectly, of health. In the light of the varying development of births during the present war, therefore, the comparison based on the crude death rates is to a certain point misleading; but the dangers involved can be partly avoided by considering infant deaths and deaths of persons over one year of age separately.

Table I summarizes available rates of infant mortality during the present and the first World War by countries. Diagram III shows the infant mortality rates in countries for which data for 1941 or 1942 are available, and for 1938. It will be observed, first, that the general pre-war picture has only been slightly modified, and, secondly, that the development during the war differs considerably from country to country. To bring out developments more clearly Diagram IV has been added, showing infant mortality by countries during the two wars.

In spite of the war, infant mortality has decreased in Switzerland, Bulgaria, Denmark, Roumania, Sweden, and the United Kingdom. In the Netherlands it has gone up by 8% but is still lower than in any European country except Sweden and Switzerland. Mortality increased in Hungary, Italy, Belgium, France, and Germany.<sup>1</sup> It is throughout lower than during the first World War. It is of interest to note, too, that a maximum occurred in 1941 in the United Kingdom, connected with the effects of bombing, and in 1940 in Western Europe, in connection with the German invasion of Belgium, Holland, and France. In spite of worse nutrition mortality later decreased slightly.

Considering mortality among the population over one year of age, we meet difficulties in constructing comparable rates. While the statistics relate in principle to civilians and exclude military deaths,<sup>2</sup> it is not always possible to estimate correctly the total number of persons on the basis of which comparable percentages can be calculated. For the present purpose it has seemed most useful, therefore, to base comparisons on the absolute numbers of deaths, and in order to give an overall picture of the situation about 1942,

<sup>1</sup> Infant deaths in the Netherlands were 39.1 per thousand during the first three quarters of 1943 as compared with 40.2 per thousand during the corresponding period of 1942.

<sup>2</sup> Military deaths are included in the case of Belgium and the Netherlands.

TABLE I  
 INFANT MORTALITY, 1913-1919 AND 1938-1942  
 (Deaths under one year per 1,000 live births)

	A. B.	1913 1938	1914 1939	1915 1940	1916 1941	1917 1942	1918	1919
Belgium	A	130	130	125	116	140	134	103
	B	73	73	85	84	78		
Bohemia- Moravia	B	—	95	94	99	98	—	—
Bulgaria	B	144	139	136	123	127		
Denmark	A	97.8	98.3	94.99	99.86	99.6	74.2	91.6
	B	59	58	50	55	55 <sup>1</sup>		
Finland	A	113	104	111	110	118	115	135
	B	68	70	88	—	—		
France	A	112	110	143	125	126	140	123
	B	66	63	91	73	70		
Germany	A	151	164	148	140	149	158	145
	B	60	60	63	63	66		
Hungary	B	131	121	134	117	134		
Italy	A	138	130	153	167	159	196	131
	B	106	97	103	116	108		
Netherlands	A	91	95	87	85	87	103	93
	B	37	34	39	43	40		
Roumania	B	183	176	189	169	—		
Sweden	A	69.7	72.9	75.8	69.7	64.5	64.6	69.6
	B	42	39	39	37	—		
Switzerland	A	96	91	90	78	79	88	82
	B	43	43	46	41	38		
United Kingdom	A	108	105	110	91	96	97	89
	B	55	53	59	62	52		

Source: 1913-1919: Office of Population Research, Princeton University.

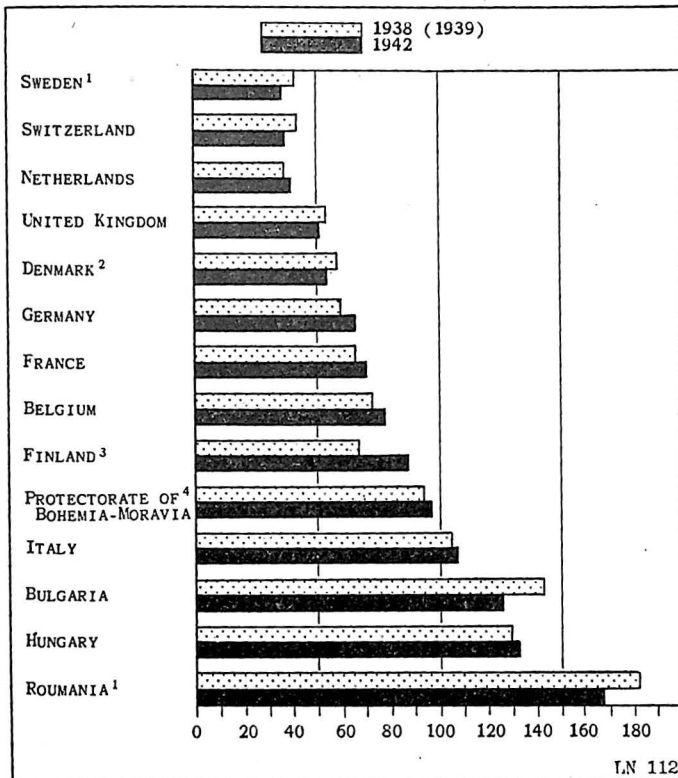
1938-1942: League of Nations Statistical Yearbook.

<sup>1</sup> Estimated figure.

## DIAGRAM III

INFANT MORTALITY IN 1938 AND 1942 (1941) IN SELECTED COUNTRIES

(Deaths under one year per thousand live births)



<sup>1</sup> Sweden, Roumania: 1941. <sup>2</sup> Denmark: estimate 1942. <sup>3</sup> Finland: 1940.  
<sup>4</sup> Protectorate: 1939.

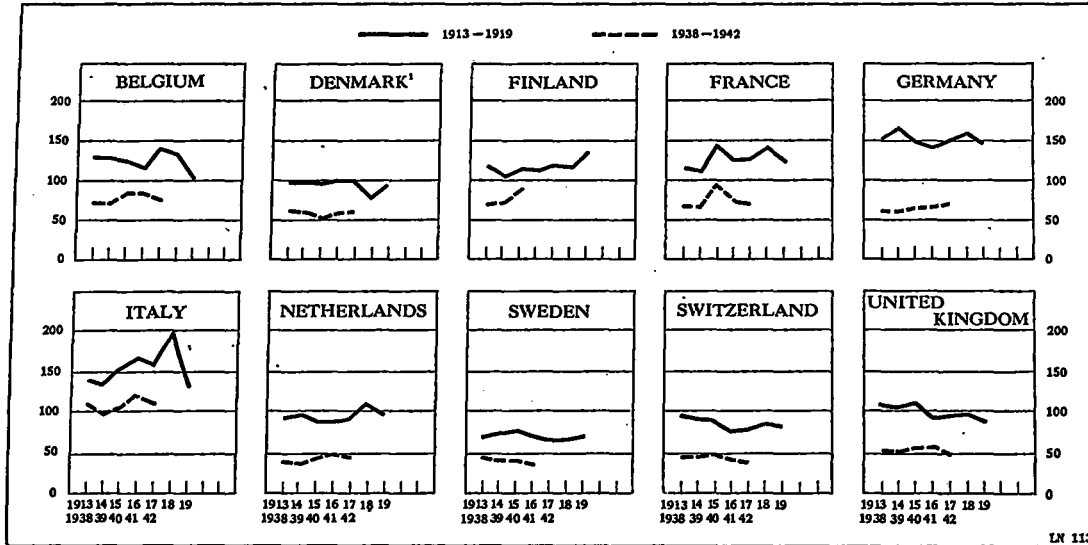
the number of deaths in that year has been expressed as a percentage of those in 1938 and is represented graphically in Diagram V.

The absence of many men in the armed forces would, *ceteris paribus*, tend to decrease the number of civilian deaths. A stable, or even slightly decreasing index of deaths, therefore, is a sign of a

## DIAGRAM IV

### INFANT MORTALITY RATES IN SELECTED COUNTRIES 1913-1919 AND 1938-1942

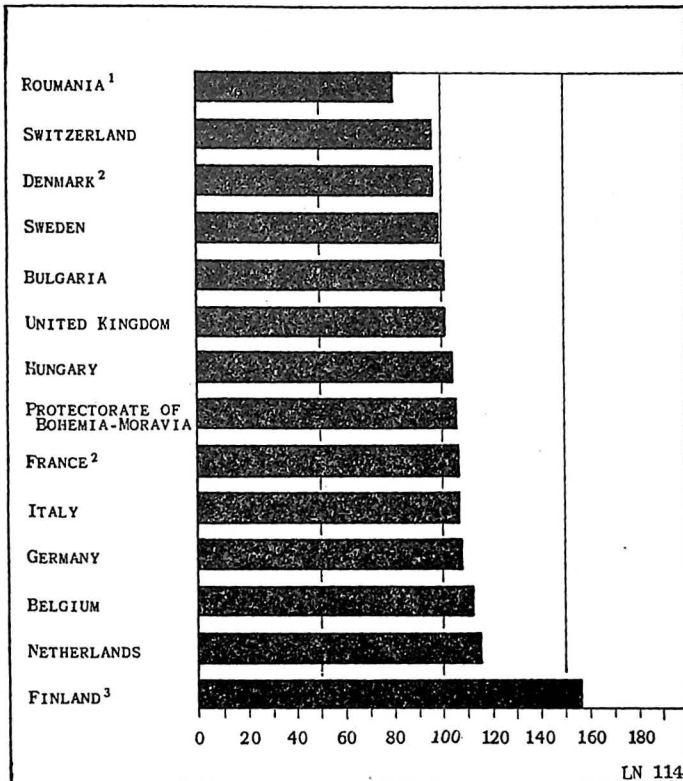
(Deaths under one year per thousand live births)



<sup>1</sup> Denmark: estimate 1942.

## DIAGRAM V

NUMBER OF DEATHS IN 1942 (1941) AS PERCENTAGE OF THOSE  
IN 1938



<sup>1</sup> Roumania: 1941. <sup>2</sup> Denmark, France: estimate 1942. <sup>3</sup> Finland: 1940.

deterioration of health. The indices of deaths have remained more or less stationary—or have decreased—in the United Kingdom, Bulgaria, Sweden, Denmark, Switzerland, and Roumania. Increases of some 5% to 6% are shown for Hungary and the Protectorate; of 7-8% in France, Italy, and Germany. The highest figures in 1942, 13-16%, are found in Belgium and the Netherlands.

In conclusion, data on mortality and morbidity point to a situation which, like nutrition, is becoming diversified on regional lines. The United Kingdom, Sweden, Switzerland, and Denmark have been able to retain their pre-war gains; they would even appear to have been able to register some further advances. Such reductions in nutrition and standard of living as the war has necessitated have been balanced by a more equitable distribution of available resources and by a scientifically improved composition of diets.

The situation in Germany is less favourable. Without stressing the importance of any one factor, death rates of both infants and adults have increased to a marked degree. Considering the German-occupied areas, it is possible, as in the case of nutrition, to divide countries into groups. The first group includes the Netherlands, the Protectorate, and Norway. No recent statistics are available from the last-mentioned country; but all the information of a non-statistical character points to the conclusion that the situation there does not differ greatly from that in the other countries in the group. The progress of the inter-war period has been interrupted; national health is exposed to a serious threat from lack of many of the usual elements of the standard of living; but infant mortality, while increasing, seems to have gone up less in the Netherlands and the Protectorate than in Germany.

In the second group, Italy, France, and Belgium, the situation is decidedly more serious: mortality was relatively high in peacetime and has increased in 1942, though not greatly. Conditions in this group would appear to differ much between different localities and social classes. Increasingly large numbers of persons, particularly in the urban centres, live under conditions which, if continued, threaten to have cumulative effects on health and mortality.

Eastern and Southeastern Europe form a third area. The Axis satellite countries—Bulgaria, Hungary, and Roumania—normally have a low standard of living and high death rates; but the demographic phenomena do not appear to have deteriorated on account of the war, and in some cases mortality has even continued its pre-war decrease. For Poland, Yugoslavia, Greece and occupied Russia,

where conditions are the worst, the statistical blackout is complete, and no reliable estimates can be made as to the true increase of ill-health and death. But such partial information as has leaked out leaves no doubt that for shorter or longer periods famine conditions have caused drastic increases in death rates, as well as a violent increase in deficiency diseases and tuberculosis.

### CHAPTER III

#### PRODUCTION AND SUPPLY

IN the course of the first three years of the war, a continuous and serious deterioration of the food supply took place on the Continent of Europe, while production increased rapidly in the British Isles and in North America. Production was well maintained on the whole in Oceania, South America and Africa, and fairly well maintained up to 1941 in Asia outside the war-stricken regions of China. Rapid strides in production were made in the U.S.S.R. until the German invasion wrought havoc or caused havoc to be wrought to the rich fields of the Ukraine, the Don region, and the Northern Caucasus.

##### *Continental Europe*

Agricultural production in Continental Europe declined steadily after the outbreak of war until 1943. In 1940 it had fallen off by about 8%, and in 1941 probably by about 12%. In 1942 there was a still more serious falling off.

In most areas, however, the impact on consumption was not immediately serious, owing either to the existence of stocks of cereals or to emergency slaughtering of flocks and herds, which helped for a time to maintain the meat supply and reduced the demand for fodder. The crops of 1941 were somewhat better than those of 1940; but dairy products continued to decline, and meat production fell off sharply. By this time stocks had been largely depleted, and as the blockade became tighter supplies available for consumption ran seriously short, particularly in the occupied countries. Rationing, which had been comparatively rare and lenient during the first year, became general during the second, and was rendered increasingly severe during the third year of the war.

A heavy decline in cereal crops in most countries of the Continent<sup>1</sup> occurred again in 1942, partly owing to weather conditions, and the decline in animal food production continued unabated throughout the greater part of this fourth year of the war. The potato crop was more favourable, however, and the sugar-beet production, which had been encouraged, was well maintained. Well

<sup>1</sup> The northernmost countries and also Portugal were notable exceptions.



maintained, also, it is believed (though it is difficult to obtain a general picture) was garden produce, the cultivation of which had been expanded and is stated in Germany to have yielded larger total returns than before the war. A considerable effort was also made to expand the cultivation of oleaginous plants in order to relieve the fat shortage. Yields, however, proved disappointing.

Such estimates as can be made for the Continent as a whole from the rather vague and incomplete data available seem to suggest that, in this fourth war-year (1942/3), the total consumption of food may have declined to roughly two-thirds of the immediate pre-war average.<sup>1</sup> The decline in aggregate calories consumed, however, was no doubt considerably less, for as livestock production, which absorbs on an average perhaps some seven vegetable calories per animal calorie produced, had been drastically cut, a larger proportion of the supply of cereals, potatoes, etc., remained available for direct human consumption.

The grain crops in 1943 were much better than in 1942. They have been estimated, for German-dominated Europe as a whole, as high as 90% of the pre-war average. In Germany, Hungary, Roumania, and Bulgaria they seem to have been the best of any year of the war, though, according to the Reich Minister of Agriculture, bread grains in Germany were still 10% below normal and fodder grains more than 15% below normal. In Northern Italy the bread grain harvest would appear to have been up to the pre-war average.<sup>2</sup> In France the crop was fairly good, though below normal requirements, as the acreage had been reduced for lack of manpower and equipment. Denmark's wheat harvest, on a reduced acreage, was only about half the normal. In Holland, bread cereals were up to the average of the rest of Europe, but there had been a considerable diversion of acreage from oats to rye so that the total cereal crop was now considerably below the pre-war average.

Harvests in the periphery of Europe were less good than in the central regions. The bread grain crop in Portugal and Norway was poor, and in Sweden it was about 17% below normal, while the

<sup>1</sup> The total mentioned is based not on calories but on fixed pre-war value weights. The grain harvest alone (*i.e.* that gathered in the autumn of 1942) is estimated to have amounted to somewhat less than three-fourths of the average pre-war crop, which was some 7% short of requirements.

<sup>2</sup> Certain estimates put the wheat harvest even somewhat above the pre-war average.

fodder grain and hay crops were light. The wheat crop in Spain is estimated at only about 60% of normal, and in Southern Italy the harvest proved disappointing.

As shown in Chapter I, the bread rations have been increased in most countries of Europe as a result of the more favourable harvest. But root crops, especially potatoes, and the maize harvest were poor, and the consequent lack of feeding stuffs is likely to affect the production of animal foodstuffs.

In considering the prospects of Europe's food production in 1944, it is well to recall the experience of the last war. As on this occasion, the cereal crop was considerably larger in the fourth year, 1918, than in the third. But productive equipment had been allowed to run down, and there was a serious shortage of manpower, of draught power, and of certain fertilizers. It was largely on account of these factors that the 1919 harvest was smaller than any during the war.

Today the Continent is again seriously short of fertilizers, draught power, and manpower. The shortage of fertilizers has been accentuated during the course of the last twelve months by the cutting off of the North African external supplies of phosphates owing to the conquest of North Africa, and by the bombing of nitrate plants. It has been estimated that in 1943 the supply of nitrates to agriculture in Germany was only about a half of what it had been before the war, and that elsewhere the curtailment was still greater.

#### *U.S.S.R.*

During the first year of the German invasion there would not appear to have been any severe food shortage in unoccupied Soviet Russia.<sup>1</sup> With the continued invasion in 1942 of rich agricultural regions normally yielding a surplus of food, the situation became serious, though it was relieved to some extent by good crops in other parts of Russia and by the reclaiming of previously uncultivated land in the east.<sup>2</sup> At the beginning of November, when the German penetration was greatest, over 100,000,000 acres, or about two-fifths of Russia's pre-war grain area, between 80 and 90 per cent

<sup>1</sup> See *World Economic Survey 1941/42*, page 55.

<sup>2</sup> The sown area of unoccupied Soviet Russia is officially reported to have been increased in the 1941/42 season by 5 million acres over 1940/41 (in identical territory).

of her sugar area, and about a half of her potato area had been occupied. The supply of cereals from the new crop and reserves in the regions remaining under Soviet control may still have represented, however, 85 to 90 per cent of the normal requirements of the population of those regions and of the civilians and soldiers from the evacuated territories.<sup>1</sup> Difficult transport conditions and great shortages of sugar, meat, lard, and vegetable oils had developed, which could not be made good by cereals, and during the Russian counter-offensive in the winter and spring of 1942/43 the reabsorption of the liberated population naturally increased the strain on the food resources.

In the territories still occupied by the Germans, the plight of the population was extreme. Even according to German estimates, the grain area sown in the Ukraine during the autumn of 1941 was only 50 to 60 per cent of the pre-war acreage, and subsequent conditions did not lend themselves to larger later sowings. As the food requirements of the occupying armies were satisfied as far as possible from the local resources, little was left for the indigenous population.

In certain parts of the U.S.S.R. the food shortage was somewhat relieved by shipments of food from allied nations. In September 1942 credit arrangements were made for Soviet purchases of up to 9 million bushels of Canadian wheat, most of which is reported to have been shipped to Russian ports by the middle of 1943. There were additional though materially smaller shipments from other parts of the British Commonwealth. Further, up to the end of October 1943, 345,000 (American) tons (approximately 11½ million bushels) of wheat and flour were shipped from the United States to the U.S.S.R. under lend-lease arrangements. These shipments were nearly all effected after the late autumn of 1942. Other lend-lease food shipments to the U.S.S.R. up to the above-mentioned date included 277,000 tons of sugar, 324,000 tons of canned meat, 441,000 tons of edible fats and oils, 136,000 tons of dried fruit and vegetables, 38,000 tons of dried eggs, and 33,400 tons of butter. Large though these quantities are, particularly of the highly concentrated foods, they were small in relation to Russia's total food requirements, and were almost exclusively used for the Soviet armies.

<sup>1</sup> Estimate of the Food Research Institute, Stanford University, California; see "Wheat Studies," November 1943, p. 64.

Most of the grain area that had been recovered by midsummer 1943 was sown to spring crops, but, owing to lack of adequate equipment and draught power, it was not in condition to yield anything like normal crops. Moreover it was affected by severe drought, as were also large areas behind the Russian lines. On the other hand, another 5 to 6 million acres was added in the 1942/43 season to the area under grain in the unoccupied regions, and crops in central Siberia are reported to have been excellent.

The outlook for next summer's crops, and hence for supplies in the 1944/45 consumption year, seems in certain respects much more favourable. At least one-half of such predominantly grain and oil seed producing areas as were still held by the Germans at the middle of 1943 was recovered in time to be sown to winter crops, and the additional areas recovered during the winter will be available for spring sowing. Moreover, the Government agricultural programme for 1943 called for a further extension of the sown area, east of the above regions, by 16 million acres—a goal which is reported to have been exceeded—and for increases in the herds of cattle by 12%, of pigs by over 16%, and of sheep and goats by nearly 14%.<sup>1</sup> The production of sugar-beet, potatoes and vegetables—particularly in factory workers' gardens—of fruit and medical plants, tobacco, and flax is also reported to have been considerably increased and is being further encouraged. But, however successful these various measures, the healing of the scars caused to Russian agriculture by the German invasion is bound to take time.

### *British Isles*

Before the war nearly two-thirds of the food supply of the United Kingdom was imported; by 1943 over two-thirds was grown at home. The national diet had become less varied but had been but little reduced in terms of calories per head, and from a nutritional standpoint, had been improved. Costs had naturally risen; in June 1943, the index of farm prices including Government subsidies was 85% higher than in June 1939. But a very great saving of shipping space had been rendered possible.

<sup>1</sup> In March 1944, the Government decreed another extension by 18½ million acres in the agricultural land to be put under cultivation this year, 13½ million acres of this additional area to be devoted to wheat production.

Official statements have revealed that by 1942 agricultural output, measured in terms of calories, had increased by 70%, if production derived from imported feeding stuffs is ignored. This enlarged output was raised on a total agricultural area (including grassland) that had shrunk by 2%, more agricultural land having been lost to industrial and military use (e.g. aerodromes) than was gained through reclamation.<sup>1</sup> But the tillable area had increased by 52.3% and arable land by 33.7%. The acreage under potatoes had increased by 80.4%, under cereals by 65.7%, and under vegetables by 55.1%. In addition, the number of allotments had grown from 830,000 to 1,675,000 and the number of private gardens from 3 million to 5 million. The acreage of these individual plots has not been published.

The area under wheat alone was raised by 35.6% in 1943 (official preliminary estimate) to some 70% over pre-war. The conversion of grassland continued on an extensive scale in 1943<sup>2</sup> and entailed a reduction in livestock including non-dairy cattle. By 1943, sheep had decreased in number by 18%, and commercially-kept pigs and poultry by 52% and 24%<sup>3</sup> respectively; but dairy herds had grown, raising the total number of cattle by 4½%. Feeding stuffs derived from imports dropped in the agricultural year 1942/43 to 1.3 million tons from a pre-war average of 8.5 million tons.

The expansion in domestic food production was achieved by more intensive farming and by increased mechanization. The total labour force in agriculture, including a substantially increased number of women, as well as prisoners of war, "is probably not much greater than before the war,"<sup>4</sup> while the number of tractors nearly trebled, rising from 55,000 in 1939 to 150,000 in 1942, and tractor implements increased nearly six-fold, rendering British agriculture the most highly mechanized in Europe.

In 1943, as a result both of favourable weather and a further expansion in the tillage area by an estimated 750,000 acres, the harvest greatly exceeded the record crop of the preceding year, the increase in bread grains being officially estimated at one million

<sup>1</sup> According to a press statement (London correspondence to *New York Times*) of October, 1943, some 4¼ million acres "have been or are being improved under Britain's draining program."

<sup>2</sup> The grassland ploughed in 1942/43 totalled 1,250,000 acres.

<sup>3</sup> If domestic poultry were included, the decrease would be less than 20%.

<sup>4</sup> *The Economist*, London, June 26, 1943, page 831.

tons and in potatoes at a quarter of a million tons. Plans are being put into effect for a still further increase in 1944.

The grain situation in Ireland in 1943 was less favourable. The wheat harvest was not good, and the shipping shortage was acute. After the outbreak of the war, the Irish farmers were obliged to keep a certain proportion of their land under the plough. The minimum was raised from 12½% in 1940 to 15% in 1941, 20% in 1942, 25% in 1943, and again to 37½% for 1944. Until recently no stipulation was made as regards the crop to be sown, but wheat growing was encouraged by a guaranteed price. The area under wheat increased from 255,000 acres in 1939 to 574,000 acres in 1942, but dropped in 1943 by an estimated 67,800 acres; the area under potatoes also dropped by some 20,000 acres or by almost 5%, although the total area under grain, root and green crops increased by 30,000 acres. The area under oats, barley and sugar beet increased by 114,000 acres (10%). Owing to the inadequate wheat harvest, the food situation deteriorated in 1943.

The growing of wheat is not traditional with the majority of farmers in the southern and western parts of Ireland, where it suffers more than other crops from the risks and uncertainties of the wet climate. The Government has accordingly endeavoured to stimulate production on the one hand by raising the guaranteed price from 50s to 55s a barrel (or 57s.6d including the fertilizer credit allowance), and on the other by decreeing that in the 1943/44 season every farmer must sow a minimum area in wheat, varying, according to counties, from one-tenth down to one twenty-fifth of his holding. Though the wheat acreage will thus be increased,<sup>1</sup> the crops are unlikely to increase in proportion, since the area extension will in part relate to poorer land and there is shortage of both fertilizers and machinery.

In the late autumn of 1943 the total space available in the ships that remained was utilized in transporting wheat from America. But it is feared that any further decrease in the volume of Irish tonnage, pending the 1944 harvest, may expose the country to a dangerous shortage of bread.

<sup>1</sup>To enable Ireland to dispense with imports of wheat, an acreage of at least 700,000 would be required, a target which might not be easily reached in a short time.

There is, however, no lack of meat or animal products, though the pig population has been reduced very considerably. The changes in livestock numbers since the beginning of the war are shown below:

	June 1st (000's)				
	1939	1940	1941	1942	1943
Cattle	4057	4023	4151	4083	4136
Sheep	3048	3071	2909	2693	2560
Pigs	931	1049	764	519	434

Exports of pork are reported to have ceased completely by 1943 and mutton and lamb exports were insignificant. But the shipments of slaughter cattle to the United Kingdom amounted in terms of meat to about twice the estimated domestic consumption of beef and veal.

#### *Far East*

The available information about Far Eastern food supply is scant. The rice crop in Japan in 1942 was good, perhaps a fifth larger than in the previous year. Food conditions during the 1942/3 season, therefore, appear to have been not unfavourable, though the wheat crop in 1942 was only mediocre. The 1943 wheat crop is unofficially estimated to have been the largest on record and the rice crop about average. The supply of fish, one of the largest items in the national diet, is believed to have been reduced.

Rice constitutes the main crop in the fifteen provinces of Free China, as the following figures compiled by the Deputy Director of the National Agricultural Research Bureau shows. In the period under review, the cultivated area had increased by over fifty million acres.

	Piculs (000,000's) <sup>1</sup>	
Total Annual Production of	1931/37	1938/42
Rice	726.3	698.9
Wheat	169.1	195.4
Barley	83.6	86.2
Corn	59.2	68.9
Sweet Potatoes	216.0	266.6

<sup>1</sup> 1 picul = about 110 lbs.

Although the greater part of the wheat surplus area is under Japanese control, the tendency during the war years, as indeed these figures suggest, has been to render the diet more varied and to supplement rice to a greater extent by corn, sweet potatoes, etc. The production of the principal food crops in the fifteen free provinces is estimated to have been 7% higher in 1943 than in 1942, the wheat harvest being perhaps as much as 15% higher. But, owing largely to difficulties of transport, famines occurred in certain districts of the interior, especially in Honan.

At the root of the recent famine in India lies the traditional phenomenon of intense population pressure upon available resources. India's population has of late been increasing by some five million annually—in British India alone by over 300,000 every month. The primitive agriculture, from which virtually all of India's present 340 million rural dwellers—87% of its inhabitants—have to subsist, cannot easily provide the additional food required by the new millions to be fed. Since the vast majority of the population are subsistence cultivators deriving their livelihood from some 50 million small holdings, even a comparatively small disturbance of the precarious food balance can have disastrous consequences, particularly for the urban population drawing their food supplies in the main from the narrow and fluctuating surplus coming forward to the market.

Several factors combined in 1942 to upset the balance. Farmers enjoyed higher money incomes as a result of the wartime inflation, but at the same time, owing to scarcity of supplies, met with difficulty in obtaining the non-farm products they required. In consequence they kept back more of their crops than formerly for home consumption or for safety reserves. Political unrest and the fear of invasion accentuated this tendency, as they did the accumulation of speculative stocks by middlemen in the villages and towns. Moreover, in normal years India imports somewhat over 1,000,000 tons of rice and paddy, practically the whole of which came from Burma, French Indo-China, and Thailand. These sources of supply had been cut off, and dangerous shortages developed in many of the larger cities, although the 1942 total harvest had been close to average. Those of the poorer town dwellers whose incomes under inflation had not risen proportionately to prices naturally felt these shortages the most acutely.



Under the Indian Constitution, the assurance of adequate food supplies falls within the administrative functions of the provincial and state authorities. But towards the end of 1942 the situation looked so threatening that the Central Government, which earlier in the year had initiated and subsidized a "Grow More Food" campaign resulting in the expansion of the food-growing area by some 12 million acres, convoked an all-Indian conference of the provincial and state governments. It was decided at this conference to drop the price control on wheat which had been found to keep supplies off the market. Further, a plan for feeding deficit from surplus areas was drawn up under which the provincial governments undertook to investigate the position in their territories, to procure all surplus supplies and make them available for distribution by the Centre to areas which were in deficit. These arrangements, helped as they were by substantial emergency imports in spite of the shipping difficulties, and helped also, a little later, by a bumper wheat crop in the Punjab early in 1943, largely achieved their immediate purpose in the cooperating regions.

Bengal alone among the principal Provincial Governments, confident that it would manage to subsist on its own rice crop, declined to join in the collective scheme drawn up at the December 1942 Food Conference, when the main anxiety was about wheat. Within a few weeks of the conference it became clear, however, that the main Bengal rice crop was so seriously affected by a cyclone and by floods that the total supply would be less than 7 million tons, which represented a deficit of over one million. Famine conditions soon developed and gained in severity in the summer and early autumn, particularly in Calcutta and other large towns to which a great number of destitute villagers, landless labourers and professional beggars had drifted, often in the last stages of weakness, and where thousands were dying each week from hunger and disease. Every effort was made to get food through to Bengal from the rest of India and from abroad. In the six months up to October nearly half a million tons of rice and other grains were thus brought into Bengal, and another 300,000 tons were assured for subsequent delivery, sufficient to see Bengal through to the winter rice crop, while a rationing scheme for Calcutta was worked out to be put

into operation in the course of November.<sup>1</sup> By December the shadow of famine was gradually lifting as the aman (winter) crop began slowly to move into the village markets. A rice crop in Bengal of over 10 million tons is forecast for the 1943/44 season against an average of 8 million tons. Further, the Government of India has arranged to import into Bengal some 650,000 tons of food grains during 1944 to relieve the Bengal Government of the responsibility for feeding the City of Calcutta and its environs.

#### *Middle East and French North Africa*

During the war there has been a fairly general tendency in the Middle East—Turkey, Iran, Iraq, Syria and Lebanon, Palestine, Transjordan and Egypt, to increase production of cereals and encourage the cultivation of vegetables. This has been partly at the expense of raw materials. In Egypt, for instance, the Government has pursued a policy which has resulted in a substantial shift from cotton to food crops.

However, owing to unfavourable weather conditions and other factors, such as lack of fertilizers and—particularly in Turkey—mobilization of farm labourers, yields fell and the crops, especially of wheat, in 1941 and 1942 were below average. Indeed, the 1942 wheat crop in the Middle East as a whole was the lowest in more than a decade, although the Egyptian harvest was somewhat above the pre-war average. In Turkey, by far the largest producer and normally an exporter of wheat, the crop was one-third short of the average for 1936-40. Except in Egypt, where, indeed, the barley, millet and maize crops were quite exceptional, and the rice crop was good in 1942, food supplies in the Middle East were generally deficient in the second and third years of the war. Conditions appear to have been the most difficult in Turkey and Iran, which had to effect considerable purchases abroad.

The tightness of the situation was accentuated in several of these countries by inflation and a consequential hoarding of supplies by the farmers. The short supplies of bread-cereals, however, were stretched under government orders in most countries, even in

<sup>1</sup> Rationing had been enforced earlier in 1943 in Bombay and certain other cities of British India outside Bengal as well as in the States of Travancore and Cochin. In October another all-India Food Conference decided on the introduction of rationing by Provincial Governments at the earliest possible moment in all towns with a population of over 100,000.

Egypt, by high extraction rates and by admixture of feed grains or bean flour. Rationing has been in force in Turkey throughout the critical years. But in Iran an effective rationing system was only introduced after the Anglo-American Agreement of December 4, 1942, which promised Iran help in obtaining cereal imports on that express condition. Considerable shipments of wheat were subsequently effected which relieved the food situation in 1943.<sup>1</sup>

The preliminary estimates regarding the 1943 crops in the Middle East indicate a considerable improvement of food conditions in the current season. Cereal crops in Turkey except maize are estimated to have been substantially better than in 1942.<sup>2</sup> The wheat crop, which is by far the most important, was nearly 50 per cent higher, and all crops except barley were at or above the pre-war average. In Egypt a record crop of barley compensated, at least in part, for a drop in the rice harvest due to insufficient water for irrigation and to lack of fertilizers. For the same reasons the wheat crop was expected ultimately to prove only little larger than the good 1942 harvest, although the area under wheat had been extended by over 20 per cent. The wheat crop for the Middle East as a whole, according to the latest estimates available, was nearly 30% larger in 1943 than in 1942.

In French North Africa, normally an exporter of wheat to the mother country, the wheat crops in recent years have been estimated as follows:

		Bushels (000,000's)				
Average						
1934/38	1939	1940	1941	1942	1943	
72	102	60	76	64	69	

The 1942 crop was small and, though some stocks may have been at hand, the supplies for the 1942/43 season were reduced by substantial shipments to France in the summer of 1942 to relieve the acute season-end shortage of wheat in the mother country. In November, when the Allies landed in Morocco and Algiers, the larger cities were found to be seriously short of food. The situation was relieved in the early part of 1943, however, by allied shipments to

<sup>1</sup> The Food Research Institute, Stanford University, California, has calculated the net imports of wheat into the Middle East during the 1942/43 season at about 10 million bushels, most of which went to Turkey and Iran under Anglo-American agreements negotiated in December and January (*Cf. Wheat Studies*, Nov. 1943).

<sup>2</sup> The 1942 maize crop was above average.

North Africa of comparatively moderate quantities of food (including some 4 million bushels of wheat) and—what was more important—of additional quantities of textiles and clothing, soap, petrol and agricultural equipment which were required *inter alia* in order to induce the farmers to liberate a part of the grain they were hoarding. The imports of agricultural equipment, moreover, helped in the agricultural rehabilitation which (as distinct from long-term reconstruction) was reported nearly concluded in North Africa in the autumn of 1943.

#### *Wheat Surplus Position in the Chief Exporting Countries*

In the three harvest years prior to the outbreak of war, the Continent of Europe grew on an average 1,626 million bushels (44.3 million tons) of wheat per annum, and imported about 160 million bushels.<sup>1</sup> Of the imports some 138 million bushels (86 per cent) came from the Argentine, Australia, Canada, and the United States. The United Kingdom and Ireland imported some 200 million bushels,<sup>1</sup> of which 86 per cent came from these sources. It is of interest to compare these figures and the available reports on recent European harvests with the figures contained in the following table, especially with the current rates of export and carry-over. The stocks of wheat available at the end of hostilities will constitute one of the most important factors in determining the measure of relief that can be afforded to impoverished areas whether in Europe or elsewhere.

It will be observed that the carry-over has grown steadily from 634 million bushels at the beginning of the war to 1680 million bushels at the end of the 1942/3 harvest year.

But in the six years between 1937 and 1943 the wheat acreage of these four countries shrank by nearly one-third, the United States reducing its area from a peak of 81 million acres in 1937 to 52½ million in 1942, Canada from 29 million in 1940 to 17½ in 1943, Australia from 14½ in 1938 to 8½ in 1943, and the Argentine from 21½ million in 1938 to 17 million acres in 1942 and 1943. These reductions were imposed or induced by government regulations to check the rapid increase in supplies and divert production to more immediately needed foodstuffs. Owing to higher yields, however, large crops were harvested up to the 1942/3 season. The wheat acreage has been diverted mainly to feed grains and olea-

<sup>1</sup> Net imports of wheat and wheat flour in terms of grain.

WHEAT ACREAGE AND SUPPLIES

Totals for Canada, U.S.A., Argentine, and Australia\*

CROP-YEAR	AREA UNDER WHEAT <sup>a</sup> MILLIONS OF ACRES	SUPPLIES			DOMESTIC UTILIZATION	SURPLUS FOR EXPORT OR CARRY-OVER	NET EXPORTS	SEASON-END STOCKS
		INITIAL STOCKS	CROP <sup>b</sup>	TOTAL				
MILLIONS OF BUSHELS								
1937-38	141	206	1449	1655	961	694	393	301
1938-39	140	301	1814	2115	996	1119	485	634
1939-40	121	634	1603	2237	948	1289	504	785
1940-41	120	785	1734	2519	950	1569	454	1115
1941-42	114	1115	1649	2764	970	1794	373	1421
1942-43	100	1421	1921	3342	1317	2025	345	1680 <sup>c</sup>
1943-44	95	1680 <sup>c</sup>	1500 <sup>c</sup>	3180 <sup>c</sup>	1670 <sup>d</sup>	1510 <sup>d</sup>	about 350 <sup>d</sup>	about 1160 <sup>d</sup>

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\* Sources:—Dominion Bureau of Statistics, Canada: Monthly Review of the Wheat Situation; U.S. Department of Agriculture: The Wheat Situation, Crop Production, Foreign Crops and Markets; Food Research Institute, Stanford University, California: Wheat Studies.

<sup>a</sup> Area planted to the 1937 crop, 1938 crop, etc.

<sup>b</sup> Harvest of 1937, of 1938, etc.

<sup>c</sup> Provisional estimate subject to revision.

<sup>d</sup> Forecast.

ginous plants; in the United States alone, 24 million acres were put under these crops between 1939 and 1943.<sup>1</sup> In 1943 the United States and the Argentine, in anticipation of increased relief shipments and increased domestic utilization of wheat for purposes other than bread, removed the wheat acreage restrictions. This change in policy came too late, however, to affect 1943 sowings in the Argentine, while, in the United States, half the increase of 3 million acres in the area sown to spring wheat was offset by the continued decline in the winter wheat area planted during the autumn of 1942. For the 1943/44 season an expansion by 14 million acres in the wheat area (from 54 to 68 million) is officially planned in the United States; 9 million acres are reported to have been added to the winter wheat area leaving 5 million acres to be added by spring sowings. In Australia a substantial increase in the 1944 wheat acreage is being officially encouraged and a larger acreage will be sown also in the Argentine. In Canada on the other hand the policy of acreage restriction is maintained. At a Dominion-Provincial Agricultural Conference in December, 1943, it was decided that it would be wiser to increase the production in Canada of coarse grain, oilbearing seeds and peas and beans, and recommended that a high proportion of the land in western Canada be summer-fallowed again in 1944.

The increase by some 350 million bushels during the 1942/43 season in the domestic utilization of wheat shown in the table is accounted for mainly by the greater use of wheat as fodder in the United States. The amount of wheat fed to livestock rose by 200 million bushels to 315 million; in addition, 54 million bushels were turned into alcohol used in the production of synthetic rubber and for other war purposes. The 1943 crop of the four major export countries is estimated to be some 420 million bushels smaller than that of 1942. But in view of the very large supply of old wheat carried over from the 1942/43 season, it is proposed to increase the domestic utilization of wheat in 1943/44 in the four countries by 350 million bushels for feed, alcohol and, in the Argentine, for fuel as a substitute for coal. Including the requirements for food and seed, the total domestic utilization may thus reach some 1670

<sup>1</sup> In the United States the harvested acreage of 49 crops, excluding wheat, cotton and tobacco (all three subjected to area restrictions), increased by 30 million acres or some 12% between 1939 and 1942.

million bushels (considerably more than an average pre-war harvest), leaving a surplus of some 1500 million bushels for export and carry-over. Unchanged net exports to the areas supplied in 1942/43 would absorb some 350 million bushels and another 200 millions are required for normal working stocks, leaving nearly one million bushels available, as and when required, for additional exports.

### *United States*

As the following table shows, cereal crops in the United States were not as good in 1943 as in 1942. Wheat was down by 14% and oats, barley and rye by 18%. This drop was caused more by lower yields than reduced acreage; but the total acreage under these four cereals was slightly reduced and directed to pulses, potatoes and oil seeds.

In conformity with the war production programme, the effort to increase food production was largely devoted to livestock. The programme was successfully carried out. Official indications at the middle of December, 1943, were that the aggregate production of sheep, cattle, hogs, poultry, eggs and milk during the year would prove to be 8% above the very large production of 1942; and 31% above production during the 1937-41 period.

Simultaneously, food requirements and demand, especially for animal food products, has greatly increased. Civilian per-capita consumption, except in the higher income groups which form a minor part of the population, has risen and improved in quality with the rise in average income. The many millions serving in the armed forces consume much more and better food on the average than they did in civilian life. Finally, Lend-Lease<sup>1</sup> food require-

<sup>1</sup> The lend-lease aid furnished up to December 31, 1943, is valued at \$20 milliards, of which services accounted for 13%, munitions for 54%, industrial items 20% and foodstuffs and other agricultural products for 13%. The size of the last item and its relative share in the total by periods has been as follows:

	1941 10 mos.	1942 12 mos.	1943 12 mos.	Total 34 mos.
Lend-Lease aid furnished	\$1244	\$7009	\$11,733	\$19,986
thereof foodstuffs, etc.	\$371	\$898	\$1321	\$2590
%	29.8%	12.8%	11.3%	13.0%

Of total lend-lease exports, through December 1943, of foodstuffs, etc., 65.4%, by value, went to the United Kingdom, 27.0% to the U.S.S.R., 5.2% to Africa, Middle East and the Mediterranean Area and 2.4% to China, India, Australia, New Zealand and some other countries. These exports were offset in some part by lend-lease in reverse of local food products delivered to United States armed forces stationed in certain of the countries concerned.

**SUMMARY OF CROP PRODUCTION IN THE UNITED STATES**

	ACREAGE HARVESTED				PRODUCTION				
	Acres (000,000's)			1943 as % of 1942	Units (000,000's)	Average 1932-41	1942	1943	1943 as % of 1942
	Average 1932-41	1942	1943						
All recorded (52) crops	330.0	338.1	347.5	+ 2.8	—	—	—	—	(-6.0)
Wheat	54.6	49.2	50.6	+ 2.8	Bushels	738	974	836	-14.2
Maize	94.5	89.0	94.8	+ 6.5	"	2,349	3,132	3,076	- 1.8
Oats, barley, rye	50.4	58.6	55.9	- 4.5	"	1,301	1,836	1,497	-18.5
Total five main cereals	199.5	196.8	201.3	+ 2.3	"	4,388	5,942	5,409	- 9.0
Rice	.98	1.45	1.50	+ 3.4	"	47	65	70	+ 7.7
Sugar Cane	.27	.32	.32	+ 1.6	Tons	5.1	5.8	6.9	+18.2
Sugar beets	.83	.95	.55	-42.1	"	9.8	11.7	6.5	-44.2
Potatoes	3.1	2.7	3.3	+22.8	Bushels	363	370	464	+25.4
Commercial truck crops	3.0	3.6	3.5	- 4.6	Tons	8.8	12.7	11.5	- 9.5
Beans	1.7	1.9	2.5	+27.8	Bags	14.3	19.0	21.8	+14.5
Peas	.24	.49	.79	+60.9	"	2.6	7.4	10.9	+46.7
Linseed	1.8	4.4	5.9	+32.6	Bushels	14	41	52	+26.8
Soyabeans	2.9	10.0	10.8	+ 8.1	Pounds	52	187	196	+ 4.6
Groundnuts	1.6	3.4	3.9	+14.8	"	1,215	2,212	2,562	+15.8
Tobacco	1.5	1.4	1.5	+ 6.2	"	1,350	1,409	1,403	- 0.4
Cotton	27.7	22.6	21.9	- 3.2	Bales	12.5	12.8	11.5	-10.4

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SUMMARY OF FIELD CROPS IN CANADA

	ACREAGE				PRODUCTION				
	Acres (000,000's)			1943 as % of 1942	Units (000,000's)	Average 1935/39	1942	1943	1943 as % of 1942
	Average 1935/39	1942	1943						
Field crops, Total	56.9	60.0	59.4	- 0.9	—	—	—	—	—
Wheat	25.6	21.6	17.5	-19.0	Bushels	312	593	294	-50.4
Rye	0.8	1.3	0.6	-57.0	"	9	25	7	-71.1
Oats and Barley	17.5	20.8	23.8	+14.7	"	427	911	699	-23.3
Buckwheat & Mixed grains	1.5	1.9	1.7	- 9.0	"	46	74	42	-42.9
Maize—for husking	0.17	0.36	0.26	-28.2	"	7	14	10	-27.9
for fodder	0.46	0.48	0.47	- 2.1	Tons	4.0	4.4	4.1	- 6.7
Beans and Peas	0.15	0.17	0.19	+11.2	Bushels	2.6	3.2	3.0	- 7.7
Linseed	0.31	1.49	2.80	+87.5	"	1.5	15.0	17.7	+18.1
Potatoes	0.52	0.51	0.53	+ 5.3	Cwt.'s	39	43	42	- 1.6
Turnips, etc.	0.19	0.16	0.16	+ 3.0	"	37	33	35	+ 5.8
Hay, clover, alfalfa	9.6	11.1	11.4	+ 1.9	Tons	16	20	21	+ 5.7

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ments increased from 2% of the United States food production in 1941 to 6% in 1942 and probably 10% in 1943.<sup>1</sup> According to official forecasts for the twelve months beginning October 1, 1943, war uses (including Lend-Lease shipments) are anticipated to absorb about one-quarter of the total food supply. The three-quarters left for civilian consumption are expected, however, to allow as large a per capita consumption as during the 1935/39 period.

### *British Dominions*

In Canada the 1943 agricultural conditions were in many respects similar to those in the United States. As will be seen from the table summarizing the field crops, most of the reduction in the area under bread grains, was offset by an increase in the area under oats, barley, linseed, and some minor crops. Cereal crops were much lighter than in 1942. Apart from the reduction in the wheat area, the most significant shift in cultivation since the war has been the very large increase in linseed production.

The rearing of livestock in the prairie provinces has been especially encouraged during the war and meat production in the country as a whole continued to increase in 1943, as the following figures show:

### LIVESTOCK AND MEAT PRODUCTION IN CANADA LIVESTOCK

	Mid-year numbers (000,000's)			1943 as % of 1942
	Average 1935/39	1942	1943	
Cattle	8.70	8.95	9.67	+ 7.9
Sheep	3.37	3.20	3.46	+ 8.2
Hogs	3.89	7.13	8.15	+14.4
Hens and Chickens	54.85	68.10	74.96	+10.1

### MEAT PRODUCTION\*

	Tons (000's)		1943 as % of 1942
	1942	1943	
Beef & Veal	248.4	256.1	+ 3.1
Mutton & Lamb	16.8	18.4	+ 9.5
Pork	413.2	451.9	+ 9.4
TOTAL	678.4	726.4	+ 7.1

\* See footnote, p. 99.

<sup>1</sup> Cf., President's message to Congress on November 1, 1943.

The rapid expansion in pork production enabled Canada to increase her shipments of pork products to the United Kingdom by 180% between 1940 and 1943. Simultaneously the domestic consumption of meat has continued to grow, as will be seen from the official estimates of consumption per capita in 1939 and 1942 reproduced below:

	1939	1942	Relative Change
Beef	56.0 lbs	63.1 lbs	+12.7%
Veal	11.2 "	10.9 "	- 2.7%
Mutton & Lamb	5.4 "	5.2 "	- 3.7%
Pork	43.6 "	49.1 "	+12.6%
Edible Offal	6.0 "	6.9 "	+15.0%
<b>TOTAL MEAT</b>	<b>122.2 "</b>	<b>135.2 "</b>	<b>+10.6%</b>
Lard	5.2 "	8.6 "	+65.4%

While meat production increased by some 30% between 1939 and 1942, milk production only rose by 8.3%. The following table shows the changes which took place in 1943 in the production and use of milk:

#### MILK PRODUCTION AND USE IN CANADA

	Tons (000's)		1943 as % of 1942
	1942	1943	
Total Production <sup>1</sup>	7,933	7,946	+ 0.2
Thereof for:			
Butter	3,856	3,905	+ 1.3
Cheese	1,058	837	-20.9
Concentrates	251	267	+ 6.4
Other use <sup>2</sup>	2,768	2,937	+ 6.1

<sup>1</sup> 1935-39 7,229,000 tons

<sup>2</sup> Fluid milk consumed or fed to livestock

\* According to monthly data of inspected slaughters covering in 1941 (latest year for which complete annual data are available) the following proportions of total production: Beef and veal, 76.2%; Mutton and lamb, 60%; Pork 75.7% Assuming the ratios of inspected to total production to have been the same in 1935-39 as in 1941, the averages for 1935/39 corresponding to the quantities shown for 1942 and 1943 would have been (metric tons, 000's): Beef and veal, 247.5; Mutton and lamb, 17.8; Pork 246.9; Total, 512.2.

In Australia, whose agricultural exports owing to the long distances involved, have been particularly affected by the shortage of shipping space during the war, expansion of food production has not been encouraged. The wheat acreage was reduced by over one-third between 1939 and 1943 and the wheat crop, while varying from year to year, has been smaller than before the war. Meat and dairy production has been fairly well maintained, owing to increased demand within the Commonwealth, especially from the United States forces stationed in Australia and neighboring Pacific areas. The herds of dairy cows were about as large in the spring of 1943 as in 1939 and total milk consumption had decreased but little. A very sharp increase in "processed milk products," quite a marked increase in cheese production and a more moderate, yet substantial (12%) increase in the consumption of fresh milk, largely offset the decline in milk used for butter manufacture. Butter exports in 1942/43 had shrunk to half of their 1938-39 amount. Over the same period consumption in Australia had increased by 15% and production had fallen by 21%. Total meat production is reported to have increased in 1943; pig slaughterings declined, but they were still at a higher level than before the war.

Agricultural conditions in New Zealand and the Union of South Africa during the war have not been fundamentally different from those here sketched for Australia, except as regards wheat in which the two dominions are normally somewhat deficient. They have accordingly somewhat extended their wheat acreage.

#### *Latin America*

The Argentine 1943 wheat crop is officially estimated to have amounted to 261 million bushels, as compared with an average of 254 during the last five years and 235 million bushels last year. Both the oats and maize crops are expected to prove very substantially better than in 1942, when maize was affected by drought. This drought affected also the beef and veal production in the following year.

The other Latin American countries, which normally specialize in the export of one or two food products and import others, have in some measure adapted their food production to war conditions.

The following Table does not cover all the countries on the Continent, but it is sufficiently complete to illustrate the trend towards greater self-sufficiency in cereals.

LATIN AMERICA, EXCLUDING THE ARGENTINE

	<i>Cereal Area (million acres)</i>					<i>Crops (million bushels)</i>				
	1930-34	1939	1940	1941	1942	1930-34	1939	1940	1941	1942
Wheat	5	6	6	6	7	63	71	64	71	76
Maize	22	25	25	26	27	380	420	415	440	415
Barley	.6	.6	.6	.6	.6	8	8	9	9	9
Oats	.4	.5	.5	.5	.6	8	9	7	9	10

The expansion of livestock production has also been actively encouraged in a number of Latin American countries during the war, especially in Brazil, which has become a very substantial producer of meat, chiefly if not exclusively for the home market, and in Mexico.

Mexico's maize harvest in 1943, according to preliminary forecasts, is relatively unfavourable, although the anticipated reduction by 25% compared with the year's volume would still leave a domestic supply larger than in 1940 and above the pre-war average. Supplementary imports will, however, be required. On the other hand, a record rice crop is forecast in Mexico and in Cuba and Peru as well.

Uruguay, like the Argentine, was severely affected by the drought of 1942/43, and lost nearly 700,000 head of cattle, and was forced to slaughter another 283,000. Accordingly, a marked decline in beef and veal production is to be expected for the current season in Uruguay.

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