

DIETS OF URBAN FAMILIES WITH LOW INCOMES¹

AN ANALYSIS OF WEEKLY FOOD BUDGETS OF 472 FAMILIES
IN BALTIMORE, CLEVELAND, DETROIT, PITTSBURGH,
AND SYRACUSE IN APRIL-MAY, 1933

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THE changes in diet made by families which suffer loss of income and the adequacy and nutritional balance of the dietary of families on relief and of families earning barely enough to maintain themselves without aid are questions very pertinent to an understanding of the health of the large number of American families which for several years have been forced to adjust their standard of living downward. Although the present study does not attempt to answer these questions precisely, the data do give, it is believed, a good indication of the type of dietary which prevailed in low-income families and of the insufficiencies which are most likely to arise from such a diet. The family food budgets on which this study is based covered a period of only one week; for the individual family this does not afford sufficient data on which to measure the extent to which the diet was lacking in the various nutrients which the science of nutrition has found to be essential, and for some of which minimum requirements are now fairly

¹From the Division of Research, Milbank Memorial Fund and the Office of Statistical Investigations, United States Public Health Service. This is the third report on diets of workingmen's families and is one of a series of articles on health and the depression based on a survey of families in ten cities made by the United States Public Health Service in cooperation with the Milbank Memorial Fund. The method and scope of the survey were described in *Sickness and the Depression*, by G. St. J. Perrott and Selwyn D. Collins, Milbank Memorial Fund *Quarterly*, October, 1933, xi, No. 4, pp. 281-298, and the method of collecting and tabulating the data on diets was outlined in the first report, *Diets of Low-Income Families in New York City*, Milbank Memorial Fund *Quarterly*, October, 1933, xi, No. 4, pp. 308-324.

well standardized. However, averages for groups of families of comparable economic status are reasonably reliable even for this short period, and from the average food supply one may draw certain broad conclusions as to the quality of the diet and the adequacy of the supply of certain kinds of foods.

The data presented are for 472 families in Baltimore, Cleveland, Detroit, Pittsburgh, and Syracuse. Since tabulations of the records by individual cities did not suggest any basic differences in food habits of families in these cities, they are combined. The records in all of these cities were obtained for a week's period late in April or in the first half of May, 1933. All families on relief are grouped together, although some had cash relief, with and without work, others received grocery orders, and a few families received food boxes; they represent a random sample of families receiving aid from some organized agency in these five cities. The other families are classified according to the money per capita available for expenditures in the week of the food record.

ENERGY VALUE OF FOOD SUPPLIES

The quantity of food needed to provide the energy used by the human body in its internal processes and in performing muscular activities is measured in terms of the calories available in the food to supply this energy. Individual requirements for energy vary according to age, sex, body weight, and type of activity, and have been carefully measured, but in the present type of study, average needs must be used for measuring the requirements of groups of individuals. Various standards of average calories needed by persons of a specific sex and age have been prepared and that used in this study was furnished by the Bureau of Home Economics of the United States Department of Agriculture. A daily supply of 3,000 calories is taken as adequate for the

adult male at moderate activity. Using this as a base, the energy needs of persons of each sex and age are expressed as a percentage; for each one hundred per cent or equivalent of an adult male in the population, there should be food yielding 3,000 calories per day. The scale of proportional requirements by sex and age used was found to give average requirements for population groups that were very close to those based on other scales, in spite of slight differences in the allowances for some age groups.²

Various nutritionists have outlined diets which supply what are considered more nearly marginal requirements for family groups. Many of these would yield from 2,600 to 2,700 calories per day per adult male unit on the basis of the scale of proportional requirements by sex and age used in this study.

There is some evidence that food allowances for adults can be lower than these average standards for adequate energy value without ill effects, except for persons who are very active. Children, however, need ample food to keep them in good health while growing, and the trend in recent years has been to increase food allowances for children, especially those in the "teen" ages, as compared with the earlier

²Comparisons were made of the requirements for energy value for families in the various income classes if different scales were used and the maximum variation was about five per cent, with differences of less than three per cent more frequent. Scales compared included: (1) that given in *A Laboratory Handbook for Dietetics* by M. S. Rose, Ed. 3, 1929, New York; (2) scale used by United States Bureau of Labor Statistics in study of "Standard of Living of Employees of Ford Motor Company in Detroit" and other studies; (3) caloric requirements agreed upon by Nutrition Committee of the British Medical Association and the advisory committee of the British Ministry of Health. The latter scale gave the greatest differences, its requirements being somewhat higher, especially the adequate values for men at moderate work which are taken as 3,000 to 3,400 calories. The mean value was used for comparison in all cases in which a range was given. These various scales provide for fully adequate or liberal amounts of food, and include a small allowance for household waste.

standards. By reducing the allowance for adults to an approximate minimum, we can make some estimate of the marginal fuel value required for the family to have an adequate food supply for children in these lowest income families. For males an allowance of 2,600 calories per day and for females an allowance of 2,200 calories, a little above the minimum standard for persons in sedentary or light occupations, has been taken as marginal.³ If it is assumed that adults consumed only this amount, when the average calories per adult male unit based on the normal or adequate scale equal 2,750 for a group of families, the adjusted value for children would be about 3,000 or adequate; when the average is 2,600 the adjusted value is approximately 10 per cent below the fully adequate standard for children.

Although there is no absolute figure below which the calories in the food supply cannot fall without endangering health, an average daily energy supply of about 2,700 calories per adult male unit seems to be a reasonable minimum for ordinary population groups, and an adequate supply of 3,000 calories is desirable, to assure full provision for growing children and protection of the vitality of adults.

Calories According to Income. When the income for the week was \$3 or more per person, the average family in these five cities had a food supply which furnished something over 3,000 calories per day per equivalent adult male (see Table 1). Below this income level, the calories available from the average food supply were less than 3,000. For families whose income was less than \$2, the calories averaged approximately 2,500 per day, and families on relief, on the average, had a diet higher in energy value than that of this lowest income

³A study of food consumption by research and technical persons in the School of Hygiene, University of Toronto, Canada, reported an average of about 2,530 calories per day for males and 2,040 for females. McHenry, E. W.: Dietary Standards. *Canadian Public Health Journal*, July, 1933.

WEEKLY INCOME PER CAPITA	NUMBER OF FAMILIES	CALORIES PER DAY ¹ PER A.M.U.	PER CENT OF FAMILIES HAVING SPECIFIED CALORIES			
			Less than 2,200	2,200- 2,699	2,700- 3,399	3,400 or More
Relief	177	2,700	24.9	32.2	25.4	17.5
Less than \$2.00	77	2,470	27.3	33.8	31.2	7.8
\$2.00-\$2.99	60	2,800	16.7	35.0	28.3	20.0
\$3.00-\$3.99	46	3,180	13.0	8.7	41.3	37.0
\$4.00 or more	112	3,350	4.5	17.0	33.0	45.5

¹ Average of the calories per day per adult male unit for each family, i.e., each family has the same weight in the average regardless of its size.

Table 1. Average calories per day per adult male unit for families of various incomes and distribution of families according to calorie supply. Based on records of a week's food supply for 472 families in Baltimore, Cleveland, Detroit, Pittsburgh, and Syracuse, April-May, 1933.

group, their food supply yielding 2,700 calories per day, approximately equal to the average caloric value of the family diets recommended for emergency use.

If we assume that the adults in these lowest income families consumed only the reduced share of the food that was suggested above as minimum for adults and distribute the remainder of the food supply among children under 18 years of age, we can approximate the extent to which the children's food supply fell below an adequate amount. This would be a minimum estimate, since the allowance for adults is very low. The following estimates of calories per day per adult male unit for children in low-income classes result:

Relief families: 2,860 calories, or 5 per cent less than adequate

Less than \$2.00

per week: 2,410 calories, or 20 per cent less than adequate

\$2.00 to \$2.99

per week: 3,200, or more than adequate

It seems very probable, therefore, that many children in

families with less than \$2 per week per person were seriously underfed. The average relief family is again found close to the borderline.

Within each income class, the calories in the individual family food supply varied over a wide range and the distribution of families according to the caloric value of their food supply also is shown in Table 1. About one-fifth of the families with \$3 or more per week reported food yielding less than 2,700 calories per day, but three-fifths of the families with less than \$2 and nearly as large a proportion of the families on relief had less than 2,700 calories. In these two lower income classes, about one-fourth of the families had less than 2,200 calories per day per adult male unit. It must be remembered that we are dealing with food records for one week and the food supply of families with such very limited incomes may vary considerably from week to week, so we cannot assume the same food supply over long periods, even though practically all of the families reported it as "usual." Also, there is opportunity for relatively large error in both the reporting and the estimating of weights of items for which only price or number of units, such as cans, packages, et cetera, was stated. These errors tend to compensate each other and average out when we consider the food supply of groups of families but cannot do so in a one week's record for an individual family. Nevertheless, the conclusion seems justified that, among families with a weekly income of less than \$3 per person or on relief, a large proportion had a food supply much below any reasonable marginal quantity necessary to maintain them in health. Among families with less than \$2 per week a number of those in the class of less than 2,200 calories reported very acute food shortages.

According to Changes in Income (1929 and 1933). How does the food supply of families whose experience with poverty

1929 ANNUAL INCOME PER CAPITA	NUMBER OF FAMILIES	CALORIES PER DAY PER A.M.U.	PER CENT OF FAMILIES HAVING SPECIFIED CALORIES			
			Less than 2,200	2,200- 2,699	2,700- 3,399	3,400 or More
1933 WEEKLY INCOME LESS THAN \$3.00 PER CAPITA OR RELIEF						
Less than \$150	61	2,420	36.1	34.4	18.0	11.5
\$150-\$424	166	2,660	24.7	31.9	30.1	13.3
\$425 or more	79	2,910	12.7	30.4	31.6	25.3
1933 WEEKLY INCOME \$3.00-\$7.99 PER CAPITA						
\$150-\$424	66	3,210	7.6	15.2	37.9	39.4
\$425 or more	61	3,250	8.2	16.4	34.4	41.0

Table 2. Caloric value of food supply of families according to their economic status before the depression and their incomes in the week of the food record, April-May, 1933.

has been short compare with that of families which might be termed the "chronic poor?" In Table 2, families on relief or with less than \$3 per person when the food records were obtained are divided into three classes according to their 1929 annual per capita income, and families with \$3 to \$8 for the week of the food record are divided into two classes according to their 1929 income. The average calories provided by the food supplies of families with \$3 to \$8 were sufficient and were the same regardless of whether or not the family had suffered a drop in income since 1929. But for families below the level of \$3, or on relief, differences in the adequacy of the food supply were associated with the previous income of the family; those who had been poor even in 1929 had the least food with an average of 2,420 calories per day per adult male unit, and the families which, in 1929, had been fairly comfortable had the most food with an average of 2,910 calories per day.⁴ Thus, the "new poor," on the aver-

⁴Families with less than \$2, \$2 to \$3 per week, and those on relief were grouped together to give larger numbers of families in each class, but the same tendency for those formerly in a higher income class to have more food

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age, seem to be more successful than the "chronic poor" in providing a food supply with adequate energy value, although their food supply was less than that of neighbors whose income was higher.

The distribution according to calories of individual families in the group of "new poor" (\$425 or more in 1929 to less than \$3 per week in 1933) is of interest since the average for the group was approximately adequate and only 10 per cent less than the average for families of higher incomes in 1933 but the same income in 1929. Forty-three per cent of the "new poor" had less than 2,700 calories, which is probably marginal for energy requirements, compared with 25 per cent of the higher income families. Among the "chronic poor" families, 36 per cent reported a very limited food supply with less than 2,200 calories per day, and 13 per cent of the "new poor" had less than 2,200 calories. (Table 2).

Size of Family and Food Supply. More large families in each income class were found to have an insufficient quantity of food than small families, even though income groupings were on a per capita basis. Families with not more than four persons had an average food supply that was fairly adequate though the income was less than \$3 per person (see Table 3) but larger families had less than 2,700 calories.

The very large families on relief seem to have fared especially those with very little income for several years is shown for families in each of these three low-income classes. The average energy value in the food supply of families of different incomes in 1929 is given below.

ANNUAL INCOME PER CAPITA IN 1929	INCOME PER CAPITA IN 1933					
	Relief Families		Less than \$2 per week		\$2-\$2.99 per week	
	Number	Calories per A.M.U.	No. of Families	Calories per A.M.U.	No. of Families	Calories per A.M.U.
Less than \$150	38	2,490	17	2,140	6	2,760
\$150-\$424	92	2,680	43	2,560	31	2,710
\$425 or more	41	2,990	16	2,560	22	2,960

SIZE OF FAMILY	NUMBER OF FAMILIES	CALORIES PER DAY PER A. M. U.	PER CENT OF FAMILIES HAVING SPECIFIED CALORIES			
			Less than 2,200	2,200- 2,699	2,700- 3,399	3,400 or More
FAMILIES ON RELIEF						
1-4 persons	62	2,910	11.3	35.5	27.4	25.8
5-6-7 persons	81	2,670	24.7	35.8	25.9	13.6
8 or more	34	2,430	47.1	17.6	23.5	11.8
LESS THAN \$3.00 PER PERSON PER WEEK						
1-4 persons	37	2,880	18.9	24.3	29.7	27.0
5-6-7 persons	70	2,530	21.4	42.9	27.1	8.6
8 or more	30	2,570	30.0	26.7	36.7	6.7
\$3.00 OR MORE PER PERSON PER WEEK						
1-4 persons	89	3,400	5.6	16.9	27.0	50.6
5-6-7 persons	57	3,180	7.0	14.0	45.6	33.3
8 or more	12	3,190	16.7	0	50.0	33.3

Table 3. Calories in food supply according to size of family and income. Based on records of a week's food supply for 472 families in Baltimore, Cleveland, Detroit, Pittsburgh, and Syracuse, April-May, 1933.

cially badly. Families consisting of eight or more persons reported, on the average, a food supply furnishing only 2,430 calories per adult male per day, and nearly 50 per cent of them had less than 2,200 calories.

Nativity of Family Heads and Food Supply. Families in which the husband and wife were native-born of native parentage had approximately the same amount of food as those of similar incomes in which the family heads were native-born of foreign-born parents or foreign-born. The number of families in each group was small when families were subdivided by income and nativity, and the differences in the caloric value of the food supply of the various groups did not appear to be significant.

AVERAGE FAMILY DIETARIES

In addition to sufficient energy value from the food eaten,

the human body must be provided with an adequate supply of each of a number of essential nutrients. Most American diets with adequate fuel value are well supplied with protein, carbohydrates, and fat. Equally important to insure health and proper growth of children are the mineral elements and the vitamins and care in the selection of foods is necessary to assure minimum amounts of each of these.

For the purpose of judging the approximate adequacy of various food elements in the dietary of these families, the amounts of specific kinds of foods reported are compared with amounts recommended as providing at a minimum cost an adequate supply, though not liberal or optimal amounts, of the essential nutrients. A further comparison is made with a more restricted dietary which is designed to furnish "approximately the minimum requirements of the body for the various nutrients, but allows little margin for safety. . . . It represents quantities of 'protective' and other foods below which it is not safe to reduce the food supply."⁵ From the requirements for each type of food given by Stiebeling and Ward⁶ to supply persons of each sex and different ages, with an adequate diet at minimum cost an average amount per week per adult male unit was computed which is used as a

⁵See Stiebeling, Hazel K. and Ward, Medora M.: *Diets at Four Levels of Nutritive Content and Cost*. United States Department of Agriculture, Circular No. 296, p. 4.

⁶*Op. cit.* pp. 14-19. Since the required amounts of each nutrient do not vary by sex and age according to the adult male unit scale, which is based on calorie needs, the average amounts of specific foods in a dietary for families or groups of persons must be adjusted. The amounts recommended for a specific sex-age group for a restricted diet and for a minimum cost diet were weighted according to the sex-age composition of the population of different income classes, and the total divided by the number of adult male units in the population. For most foods the average per adult male unit for different income classes was affected very little by differences in the age composition, and a single average was taken as the standard for comparison with amounts actually purchased. Since the average quantity of milk varied considerably the specific average for each income class has been used for comparison.

standard for a minimum cost adequate dietary. Similarly, average amounts in the restricted dietary were computed to obtain a standard with which amounts actually purchased can be compared.

Moderate-Income Families. The average supply of various kinds of food in the dietary of families with \$3 or more per week, a group which had an adequate quantity of food to supply energy requirements, is shown in Table 4. These families had about as much or more than the recommended quantities of all foods except dried legumes, dried fruits, and milk. The foods showing the greatest excess over recommended amounts were meat and fish, eggs, tomatoes and

Table 4. Average amount of various foods per week reported by families with \$3.00 to \$3.99 and by families with \$4.00 or more per person per week in five cities, April-May, 1933.

KIND OF FOOD	STANDARD FOR ADE- QUATE DIET ¹	POUNDS PER WEEK PER A.M.U. FOR FAMILIES WITH INCOME OF		PER CENT ABOVE OR BELOW STANDARD	
		\$3.00- \$3.99	\$4.00 or More	\$3.00- \$3.99	\$4.00 or More
Milk, and equiv. cheese—qts.	5.40	3.80	4.06	-30	-25
Meat and fish	1.15	2.28	2.73	+98	+137
Eggs	.57	.91	1.09	+60	+91
Potatoes	3.27	4.30	4.26	+32	+30
Tomatoes and citrus fruit	1.16	1.68	2.13	+43	+84
Vegetables, canned and fresh	2.25	2.41	2.83	+7	+26
Leafy, green or yellow	1.94	1.87	2.09	-4	+8
Fruits, fresh and canned	1.55	1.65	1.97	+6	+27
Legumes, dried and canned, nuts	.57	.17	.10	-70	-82
Dried fruits	.45	.09	.12	-80	-73
Fats and fat foods ²	.95	1.06	1.32	+12	+39
Sugar, syrup, jelly	.90	1.52	1.57	+69	+74
Bread and equivalent cereals	6.01	6.25	6.42	+4	+7

¹See footnote 6.

²Includes lard and substitutes, butter and substitutes, vegetable oils, bacon and pork sausage, and cream; the latter was reported rarely.

citrus fruits, and sugar. Although these families had more than sufficient lean meat and eggs, and substitution of milk and fresh vegetables for some of these would give a more liberal supply of calcium and vitamins, and although a less expensive diet could have been provided by using more dried fruits and legumes, the foods actually used would provide a satisfactory diet.

Present nutritional standards emphasize the consumption of milk by adults, and the standard amount for an adequate diet given in Table 4 includes a pint of milk a day for all adults. In at least half the families in these higher income classes it was reported that no adults drank milk and, in many other families, adults seem to use very little of the family supply.⁷ On the basis of a quart of milk a day for each child under 18 years of age, the average per adult male unit for these families would be 3.6 quarts and the amount purchased was somewhat above this. Thus, these families had enough milk to provide liberally for their children, but not the suggested quantity for adults.

Lowest Income and Relief Families. The choice of foods of families whose incomes were less than \$2, \$2 to \$3 per person per week, and also of relief families, is shown in Table 5, which gives the average quantities of various foods or groups of foods. The limited quantity of food available to the families in these income groups makes it very important that the quality of the diet be guarded by a wise selection of foods.

The proportionate amount less of the various foods used by these low-income groups than by their neighbors in the highest income class is given in Table 6. The greatest reductions, if we may assume that these families would have had

⁷The information was not definite as to how much milk was consumed by individual members of the family but the general question was asked as to whether the milk supply was used by children, adults, or both.

a food supply similar to that of the higher income families had more money been available, were made in the amount of citrus fruits and tomatoes, fresh and canned vegetables, meat, eggs, fresh and canned fruit, and milk; and the percentage reduction ranked in about the order named, with the citrus fruits highest, for each income class. The costliness of the food in relation to its "filling value" seems to have determined its use rather than any understanding of the importance of certain foods as sources of essential nutrients.

The percentage variation of the average supply of each group of foods from the standard requirement for an adequate low cost diet is shown in Figure 1 for families in each

Table 5. Average amount of various foods per week reported by 472 families of different incomes in five cities, April-May, 1933.

KIND OF FOOD	STANDARD RE- STRICTED DIET ¹	POUNDS PER WEEK PER A.M.U. FOR FAMILIES OF SPECIFIED INCOME			
		Relief Families	Weekly Income per Capita		
			Under \$2.00	\$2.00- \$2.99	\$3.00 or More
Milk, and equiv. cheese—qts.	3.95	3.29	2.42	2.87	3.97
Meat and fish	.56	1.25	1.37	1.77	2.60
Eggs	.30	.73	.62	.90	1.03
Potatoes	3.32	4.34	3.91	4.16	4.27
Tomatoes—citrus fruit	1.21	.89	.77	1.18	2.00
Vegetables, fresh—canned	1.18	1.71	1.31	1.60	2.70
Leafy, green, yellow	1.02	1.20	.90	1.26	2.02
Fruit, fresh—canned	.75	.89	1.15	1.37	1.88
Legumes, dried—canned, nuts	.54	.23	.12	.20	.12
Dried fruits	.22	.15	.08	.10	.11
Fats and fat foods ²	.85	.91	.78	.95	1.25
Sugar, syrup, jelly	1.03	1.27	1.22	1.23	1.56
Bread, and equiv. cereals	6.67	5.80	5.73	5.95	6.37

¹See footnote 6. For milk the average requirements for each income class are: relief—3.95 qts.; under \$2—3.76 qts.; \$2.00-\$2.99—3.64 qts.; \$3 or more—3.55 qts.

²Includes lard and substitutes, butter and substitutes, vegetable oils, bacon and pork sausage, and cream.

KIND OF FOOD	PER CENT VARIATION FROM AVERAGE AMOUNT FOR FAMI- LIES WITH \$3.00 OR MORE			PER CENT VARIATION FROM STANDARD FOR RESTRICTED DIET			
	Relief Fam- ilies	Less Than \$2.00	\$2.00- \$2.99	Relief Fam- ilies	Under \$2.00	\$2.00- \$2.99	\$3.00 or More
Milk and equiv. cheese	-17	-39	-28	-17	-36	-21	+12
Meat and fish	-52	-47	-32	+123	+145	+216	+364
Eggs	-30	-40	-13	+143	+107	+200	+243
Potatoes	+2	-8	-3	+31	+18	+25	+29
Tomatoes—citrus fruit	-55	-62	-41	-26	-36	-3	+65
Vegetables, fresh—canned	-37	-52	-41	+45	+11	+36	+128
Leafy, green, yellow	-41	-55	-38	+18	-12	+24	+98
Fruits, fresh—canned	-53	-39	-27	+19	+53	+83	+151
Legumes, dried—canned, nuts	+92	0	+67	-57	-78	-63	-78
Dried fruits	+36	-27	-9	-32	-64	-55	-50
Fats and fat foods	-27	-38	-24	+7	-8	+12	+47
Sugar, syrup, jelly	-19	-22	-21	+23	+18	+19	+51
Bread, and equiv. cereals	-9	-10	-7	-13	-14	-11	-5

Table 6. Percentage variation of the food supply of lower income groups from that of families with \$3.00 or more per person per week and percentage deviation from the standard for a restricted diet.

of the income classes. In spite of a much lower consumption of meat and eggs than in the higher income families, the average amount reported by the lower income and relief families was in excess of the standard for a minimum cost adequate diet. Sugar and potatoes were used in greater amounts also than called for by this standard, the latter being preferred apparently to bread and cereal foods, since the amount of bread was reduced more than the amount of potatoes. The foods used in smaller quantities than those recommended as adequate were fresh and canned vegetables and fruits, legumes, dried fruits, and milk. On the average, these families, which had marginal, or less than marginal,

amounts of calories, were well supplied with animal protein foods but neglected especially the foods necessary for adequate provision of vitamins and mineral elements in the diet.

The probable deficiencies in the food supply of these families are suggested by comparing the average amounts used with the standard for a restricted diet, which provides a minimum of specific food factors for safety. The percentage variation of the average supply of various foods from this standard is shown in Table 6 and Figure 2 for families in the different income classes.

The relief families and those with \$2 to \$3 had more than the restricted standard for potatoes, fresh and canned vegetables, fruits except citrus, fats and sugars, the per cent in excess of need varying from 7 and 12 for fats, to 45 and 36 per cent for all fresh and canned vegetables, and 83 per cent for fruits used by families with \$2 to \$3. The amounts of meat and fish and eggs were two to three times the suggested quantity.⁸ Families in these two income classes used from one-third to two-thirds less than the suggested quantity of dried legumes and dried fruits, a little more than 10 per cent less than the recommended amount of bread and cereals and 17 and 21 per cent less milk. The average use of tomatoes and citrus fruits by families in the two-dollar income group was approximately equal to the restricted standard, but relief families were 26 per cent below need.

The shortage of milk is undoubtedly the most serious lack in the dietary of these families, since it is less than the amount needed to furnish one pint of milk a day for children and women and one-half a pint for men. Milk is the chief

⁸The amount of meat and fish allowed by this restricted emergency diet is only a little more than half that allowed by some standard diets for relief families. Thus, the bulletin on "Food Allowances" issued by the Temporary Emergency Relief Administration of New York, August 15, 1932, recommended approximately one pound of meat and fish per equivalent adult male.

was poorly balanced, too much emphasis being placed on meats, eggs, potatoes, and sweets and too little attention paid to "protective" foods. Not only is the calcium content of this diet approximately 25 per cent less and the phosphorus content about 15 per cent less than in the restricted standard dietary, but also there is a strong likelihood that vitamins A, C, and D are below the standard for safety.⁹

One of the striking indications of these low-income dietaries is that families with too little money to buy enough of their habitual foods do not reshape their diet and use cheaper substitutes but purchase less of the foods customarily used. They have not learned that a diet built around cereals and milk is cheaper and more nutritious than one built on meat and potatoes. Much popular education concerning the importance of the protective foods and on planning minimum cost adequate diets has been carried on but experience in this and other fields seems to indicate that it might be set down as almost axiomatic that those most in need of the information are hardest to reach.

Low-Income Families (1933) in Relation to Previous Income (1929). The relation of the predepression economic status of the family to the choice of foods by families with less than \$3 per person per week or on relief is shown in Table 7. Although families which had been in moderately comfortable circumstances in 1929 (annual income of \$425 or more per capita), on the average, had enough food to furnish adequate energy, their dietary was not well balanced due to an unwise selection of foods. The milk supply was 20 per cent less than the restricted standard and this, together with amounts of fruits and vegetables only slightly above the standard, makes the calcium content at least 10 per cent less than is provided by the restricted dietary. Meat and fish, eggs, potatoes, fats,

⁹The data were incomplete with respect to the use of whole grain cereals and it is not possible to estimate the sufficiency of the supply of vitamin B.

KIND OF FOOD	RE- STRICT- ED ¹ STAN- DARD	POUNDS PER WEEK PER A.M.U. FOR FAMILIES WHOSE 1929 PER CAPITA INCOME WAS			PER CENT ABOVE OR BELOW RESTRICTED STANDARD		
		Under \$150	\$150- \$424	\$425 or More	Under \$150	\$150- \$424	\$425 or More
Milk and equivalent cheese—qts.	*	2.92	3.05	3.00	-29	-22	-20
Meat and fish	.56	.92	1.34	1.80	+64	+139	+221
Eggs	.30	.62	.73	.84	+107	+143	+180
Potatoes	3.32	3.83	4.23	4.61	+15	+27	+39
Tomatoes, citrus fruit	1.21	.69	.92	1.05	-43	-24	-13
Vegetables, fresh—canned	1.18	1.25	1.59	1.82	+6	+35	+54
Leafy, green, yellow	1.02	.92	1.11	1.34	-10	+9	+31
Fruit, fresh—canned	.75	.80	1.06	1.26	+7	+41	+68
Legumes, dried—canned, nuts	.54	.19	.18	.22	-65	-67	-59
Dried fruits	.22	.13	.11	.15	-41	-50	-32
Fats, fat foods	.85	.77	.88	1.01	-9	+4	+19
Sugar, syrup, jelly	1.03	1.13	1.33	1.20	+10	+29	+17
Bread, and equivalent cereals	6.67	5.48	5.71	6.45	-18	-14	-3

¹See footnote 6.

*Standard for milk is: Under \$150—4.09 qts.; \$150—\$424—3.90 qts.; \$425 or more—3.60 qts.

Table 7. Relation of the economic status in 1929 to the average supply of various foods for families on relief or with less than \$3 per week per capita in five cities in April-May, 1933.

and sugars were purchased in larger quantities than is recommended for an adequate diet at minimum cost.

The dietary of the "chronic poor" was very deficient in foods essential for provision of minerals and vitamins; tomatoes and citrus fruits, milk, bread and cereals, and legumes were much less than marginal requirements, and leafy, green, and yellow vegetables, and fats were about 10 per cent below the restricted standard. Meat and eggs, though used in smaller quantity than by families in any other income class,

exceeded the amount recommended for a restricted emergency diet. In spite of at least several years' experience with poverty, these families did not make the best possible use of their money.

USE OF SPECIFIC FOODS BY INDIVIDUAL FAMILIES

While the average supply of foods gives a good indication of the type of diet favored by the families in the various income classes, individual families differ widely in the prominence of specific foods in their diet and it is of interest to consider some of these differences. In Table 8 is shown the percentage of families in a given income class which reported a specific amount of each food or group of foods. For each food, the amounts used are divided into three broad classes, the lowest class being less than the amount which was recommended for the restricted emergency diet and the highest class being more than the adequate standard when this was definitely higher than the emergency standard.¹⁰ Only some of the more significant indications in Table 8 can be referred to in the following comments.

Meat and Fish. Although the average amount of meat and fish for all income classes was much higher than the restricted standard, nearly one-fourth of the families with less than \$2 and 15 per cent of the relief families had less than this standard. The desire of practically all families for more meat than is allowed in the minimum cost adequate diet is demonstrated by the fact that 86 per cent of families with \$3 or more purchased more than 1.25 pounds per week per adult male unit, and 63 per cent of the families with less than \$3 in 1933 but formerly in the "comfortable" class continued to buy an excess of meat.

¹⁰The standard requirements for many foods, especially those not primarily energy foods, would vary for individual families according to the age and sex composition. The class intervals are taken, therefore, in round numbers and not the exact figures shown as the weighted average standard for groups of families.

ling to amount of various foods
used, for families classified by income for week of food record and by
change in income since 1929.

KIND OF FOOD AND AMOUNT PER WEEK PER A.M.U. ¹	WEEKLY INCOME PER CAPITA IN 1933				RELIEF OR UNDER \$3.00 IN 1933 WITH 1929 INCOME PER CAPITA OF		
	Relief	Under \$2.00	\$2.00- \$2.99	\$3.00 or More	Under \$1.50	\$1.50- \$4.24	\$4.25 or More
<i>Meat and Fish</i>	100.0	100.1	100.0	100.0	100.0	100.0	100.1
Less than .50 lbs.	15.3	23.4	8.3	4.5	23.0	15.7	11.4
.50-1.24	41.8	31.2	30.0	9.0	54.1	36.1	25.3
1.25 or more	42.9	45.5	61.7	86.5	22.9	48.2	63.4
<i>Eggs</i>	100.0	100.1	100.0	100.0	100.0	100.0	100.0
Less than .30 lbs.	10.2	16.9	3.3	1.9	14.8	10.9	7.6
.30-.59	32.4	39.0	26.7	15.2	42.6	31.5	26.6
.60 or more	57.4	44.2	70.0	82.9	42.6	57.6	65.8
<i>Potatoes</i>	100.0	100.1	100.0	100.0	100.0	100.0	100.0
Less than 3.00 lbs.	26.0	39.0	28.3	31.2	29.5	30.1	25.3
3.00-4.49	29.4	33.8	31.7	31.2	44.3	28.9	25.3
4.50 or more	44.6	27.3	40.0	37.6	26.2	41.0	49.4
<i>Tomatoes and Citrus Fruit</i>	100.0	100.0	100.0	99.9	100.0	100.0	100.0
None	13.6	26.3	18.6	7.1	21.3	15.3	19.0
Less than 1.00 lbs.	50.6	38.2	25.4	16.2	52.5	44.8	34.2
1.00-1.99	26.1	25.0	40.7	31.8	21.3	28.2	32.9
2.00 or more	9.7	10.5	15.3	44.8	4.9	11.7	13.9
<i>Leafy, Green, Yellow Vegetables</i>	100.0	100.0	99.9	99.9	100.0	100.1	99.9
None	18.6	16.9	12.7	4.8	16.1	16.5	19.4
Less than 1.00 lbs.	30.5	52.1	30.9	24.1	48.2	38.0	23.6
1.00-1.99	31.7	21.1	34.5	27.6	23.2	30.4	31.9
2.00 or more	19.2	9.9	21.8	43.4	12.5	15.2	25.0
<i>Fruits, excl. Citrus, fresh-canned</i>	99.9	100.0	100.0	100.0	100.1	100.0	100.0
None	40.1	40.3	28.1	13.8	37.7	39.8	31.6
Less than .75 lbs.	16.4	13.9	15.8	4.6	19.7	17.4	7.8
.75-1.49	19.7	22.2	17.5	27.0	29.6	15.5	22.4
1.50 or more	23.7	23.6	38.6	54.6	13.1	27.3	38.2
<i>Dried Legumes, Nuts</i>	100.0	100.0	100.0	99.9	100.0	100.0	100.0
None	64.4	80.5	66.7	78.8	73.8	69.3	65.8
Less than .40	14.7	10.4	18.3	11.5	9.8	16.3	12.7
.40 or more	20.9	9.1	15.0	9.6	16.4	14.4	21.5
<i>Dried Fruits</i>	100.0	100.0	99.9	100.0	100.0	100.0	100.1
None	58.2	75.0	73.3	71.3	54.1	69.7	64.6
Less than .20	9.6	6.6	5.0	4.5	13.1	6.7	5.1
.20 or more	32.2	18.4	21.6	24.2	32.8	23.6	30.4
<i>Fats and Fat Foods</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than .80 lbs.	47.5	55.3	42.4	19.1	55.7	49.7	39.7
.80-1.19	28.2	25.0	35.6	39.5	27.9	27.3	30.8
1.20 or more	24.3	19.7	22.0	41.4	16.4	23.0	29.5
<i>Sugar, Syrup, Jelly, Et Cetera</i>	100.0	100.1	100.0	100.0	100.0	100.0	100.1
Less than .80 lbs.	18.1	23.9	22.0	14.2	25.0	14.4	26.9
.80-1.19	32.2	26.9	34.0	23.4	35.0	30.7	29.9
1.20 or more	49.7	49.3	44.0	62.4	40.0	54.9	43.3
<i>Bread and equiv. Cereals</i>	100.0	100.0	100.0	100.0	100.1	100.1	100.0
Less than 5.00 lbs.	35.7	34.7	41.4	25.8	36.7	38.3	29.3
5.00-6.99	36.8	36.0	27.6	40.0	41.7	34.0	32.0
7.00 or more	27.5	29.3	31.0	34.2	21.7	27.8	38.7
NUMBER OF FAMILIES ²	177	77	60	158	61	166	79

¹The class limits are set so that the upper limit of the lowest class is slightly less than the amount in the restricted standard and the lower limit of the highest class is slightly more than the adequate standard, when that is higher than the restricted.

²The number changes slightly for some items, because a family was omitted in this tabulation if the quantity of a specific food included in the food group was not definite.

Eggs. The popularity of eggs with the majority of families is indicated by the large proportion of families which used more than the adequate standard and the very small percentage of families which used less than the restricted standard. Because of the richness of eggs in vitamins A, B, D, and G in addition to their iron and protein content, they make important nutritional contributions to these low-income diets, but should not replace milk for children.

Potatoes. The use of potatoes varied less according to income than most foods. From 25 to 31 per cent of the families in the various income classes except the lowest (under \$2) used less than three pounds per adult male unit per week and 39 per cent of the lowest income families had less than three pounds. Except for the lowest income class and the "chronic poor," about 40 per cent of the families had 4.5 pounds or more.

Tomatoes and Citrus Fruits. The marked differences in the use of tomatoes and citrus fruit according to income are significant. Of the families with \$3 or more per person per week, about 45 per cent had a weekly supply of over two pounds per adult male unit and only 7 per cent reported none, but of families with less than \$2 and of the relief families only 10 per cent had two pounds or more and 26 and 14 per cent of these groups respectively reported none. The percentage of the "new poor" using none was about the same as of the "chronic poor" (19 and 21 per cent), but more of the "new poor" had an adequate amount. These foods which are so important as a source of vitamin C were used liberally by most families when funds were not limited, but their importance in a restricted diet did not seem to be understood.

Leafy, Green, Yellow Vegetables. From 13 to 19 per cent of the low-income and relief families had none of this group of vegetables. Fifty per cent of the relief group had at least

marginal requirements but only 30 per cent of the families with less than \$2 met this standard. Among the poor families which had been "comfortable" in 1929, 19 per cent had none of these vegetables, as high as for any income class, but 57 per cent of the families had at least one pound per adult male per week.

Fruits, Except Citrus. Fruits were used liberally by more than half of the families in the high-income class, but 40 per cent of those in the lowest income class and on relief had none. In the use of fruits, there seems to be a tendency for the family either to have none or to use them in excess of the amounts recommended for an adequate low-cost diet, and this was especially true of the families which had become poor since 1929.

Dried Legumes and Nuts. The cheapness of dried beans and peas and of nuts in relation to their value as sources of protein and mineral substances and also of energy value did not seem to be appreciated by these families. From 65 to 85 per cent of the families reported none at all, but about 15 per cent of these purchased canned pork and beans. The season in which the records were obtained may have influenced the use of legumes, since families which used them during the winter months may have sought a change by the use of fresh vegetables, some of which were becoming available at moderate prices early in May.

Dried Fruits. Nearly three-fourths of all families not on relief had no dried fruits, and 58 per cent of the relief families had none. About one-third of all relief families, of the "chronic poor," and of the "new poor," had .20 pounds or more per adult male unit.

Fats. The use of fat foods varied according to income more than other staple articles of diet such as sugar, bread, and potatoes. Of the families with \$3 or more, only 19 per cent

used less than .80 pounds per week per adult male unit, but 55 per cent of those with less than \$2 and 48 per cent of the relief families had less than .80 pounds.

Sugary Foods. The excessive use of sugar and other sweets is rather striking, about 50 per cent of the poorest families had a supply of more than 1.20 pounds per adult male unit, although the average standard for an adequate amount was approximately one pound.

Bread and Cereals. It is surprising to find one-third of these low-income families using less than five pounds of bread and equivalent cereals, and to find a smaller proportion of families of low-income than of relatively high-income families which are liberally supplied. In a balanced diet at minimum cost, cereal foods should have a larger place than in the food budget of moderate cost, but no tendency to follow this policy is indicated by these data. A larger percentage (39) of the families of low-income which had been "comfortable" in 1929 than of any other income class had an ample supply.

Table 9. Percentage distribution of families according to quarts of milk purchased per week per person under 17 years of age, for families of various incomes in 1933 and according to 1929 income, in five cities.

QUARTS PER WEEK PER CHILD UNDER 17 YEARS OF AGE	WEEKLY INCOME PER CAPITA IN 1933				RELIEF OR UNDER \$3.00 IN 1933 WITH ANNUAL PER CAPITA INCOME IN 1929 OF		
	Relief	Under \$2.00	\$2.00- \$2.99	\$3.00 or More	Under \$150	\$150- \$424	\$425 or More
Any number	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than 3	24.7	46.7	26.3	12.1	47.5	28.6	21.1
3.0-5.9	53.0	33.3	49.1	32.6	32.8	54.0	46.5
6.0-8.9	16.3	16.0	15.8	28.4	14.8	13.7	21.1
9.0 or more	6.0	4.0	8.8	26.9	4.9	3.7	11.3
NUMBER OF FAMILIES	166	75	57	141	61	161	71

Milk. The distribution of families according to the supply of fresh and canned milk per child under 17 years of age is shown in Table 9. As most of the milk was consumed by the children and nutritionally it is of special importance to them, the amount per child is more significant than the amount per adult male unit. Only 12 per cent of families with \$3 or more per week had less than three quarts of milk per child, but 47 per cent of families with less than \$2 had this limited supply. Among the relief families, 25 per cent had less than three quarts per child. From 20 to 25 per cent of the families in the lower income classes had six quarts or more per child per week, but 32 per cent of the "new poor" had at least six quarts.

SICKNESS AND FOOD SUPPLY

No attempt has been made to correlate the family dietary with the sickness records obtained for the three months immediately preceding the health survey of which these data on food supply were a part. If these 472 families are subdivided according to the adequacy of food supply and income, the number of persons in a specific class obviously is too small to give a stable or reliable sickness rate during a three-months' period. When the food records were collected, it was expected only that they would give an indication of whether nutritional deficiencies might be a factor contributing to ill health in these cities. Although housing and other factors in the standard of living also are adversely affected by low income, the very marked association between income and the adequacy of the diet and the well-known inverse correlation between income and the incidence of illness give good reason to believe that there is some association between sickness and diet.

The incidence of sickness in these five cities and in other

cities in the survey has been published, not for individual cities but for groups of cities.¹¹ Sickness showed a consistent correlation with the economic status of the families, the lower the income the higher the sickness rate, and also a striking association with unemployment, families with no employed workers having about 50 per cent more cases of disabling illness than those with a full-time worker. These results are consistent with the differences found in the food supply which, for families with less than \$3 per week per person, was, in general, about marginal or less than marginal in quantity with a marked tendency to be poorly balanced and to have less than "safe" requirements of milk and other protective foods. Sickness rates were highest in families with less than \$150 per person in the year 1932.

For families which had suffered marked loss of income between 1929 and 1932, however, the sickness rate and the food supply do not show similar differences when compared with the "chronic poor." The "new poor" had a much higher sickness rate but they had, on the average, a more nearly adequate food supply than the "chronic poor." While this lack of correlation cannot be explained fully, certain indications in the data suggest possible factors involved in the high sickness rate. For example, it is evident that reduced income brought about marked changes in the usual dietary and that the foods necessary to maintain good nutritional balance were reduced, on the average, below the level of accepted requirements and in some cases below the safe marginal level. Thus, the amounts of milk and tomatoes and citrus fruits were below the quantities recommended for

¹¹Rates for Birmingham, Detroit, and Pittsburgh were published in *Sickness and the Depression*, Perrott, G. St. J., and Collins, Selwyn D.: *Milbank Memorial Fund Quarterly*, October, 1933, pp. 281-298; rates for Baltimore, Cleveland, and Syracuse in *Sickness and the Depression* by the same authors in the *Quarterly*, January, 1934, pp. 28-34.

emergency restricted diets and vegetables were not used in fully adequate amounts; all of these foods were used in much smaller amounts than these families were accustomed to, if we may assume that their diet previously had been similar to that of their neighbors who were not so poor. Furthermore, the individual family did not have the average diet and Table 8 shows that in the case of many foods the per cent of the "new poor" inadequately supplied was as high as the per cent of the "chronic poor." For example, 19 and 21 per cent of the "new poor" and "chronic poor" respectively had no tomatoes or citrus fruits, 19 and 16 per cent had no leafy, green, or yellow vegetables, 65 and 54 per cent had no dried fruits, and 32 and 38 per cent had no fresh and canned fruits; and 25 and 29 per cent had less than three pounds of potatoes per adult male unit. Families unaccustomed to such deprivations of food may have contributed heavily to the high sickness rates among the "new poor."

Specific food deficiency diseases were not found among the illnesses reported by the families surveyed in these cities. The relationship between the diet and sickness, if it is accepted that there was some association, would seem to be more a matter of lowered vitality and reduced resistance to disease.