AN EXPERIMENT IN NUTRITION TEACHING BY PUBLIC HEALTH NURSES[1]

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THE promotion of better nutrition through instruction concerning the nutritional needs for the maintenance of good health is a legitimate part of the public health program and a proper function of public health nursing. The nurse, because of her close contact with families where there are health problems, has an unusual opportunity to emphasize the value of a good diet as a preventive measure.

This report describes an experiment in nutrition teaching conducted by public health nurses in sixty Negro families in 1943. These families were living in Area 8 of Upper Harlem in New York City and were under public health supervision because of familial exposure to infectious tuberculosis.

Because of a special program for control of tuberculosis in Area 8 of Upper Harlem, all of the tuberculous families in that area have been visited at fairly frequent intervals for public health supervision since April, 1939.[2] Detailed records about the social and economic condition of each family were obtained and changes in these conditions were noted. Data of food habits have been obtained also, and general nutrition teaching has been a part of the nursing supervision since 1939. Due to the nurses' teaching, and possibly also to increases in income, there had been some improvement in dietary patterns previous to the beginning of the experiment reported upon here (1,2).[3]

[1] From the Community Service Society, the Milbank Memorial Fund, and the New York City Department of Health.

[2] Dr. Herbert R. Edwards, director of the Bureau of Tuberculosis, is medical director of the special study program. The medical staff of the Tuberculosis Clinic was provided by the Department of Health. The nursing and clerical staffs of the Tuberculosis Clinic were provided by the Department of Health after December 1, 1941; until then, they were provided by the Community Service Society. The home visiting, which included the nutrition teaching described in this report, was done by five staff nurses of the Community Service Society under the supervision of Miss Jean South, R.N.

[3] In a study of changes in income and food expenditures among tuberculous families in

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Method of Sampling and Plan of Study

The original sample consisted of seventy-three families drawn at random from a list of tuberculous families under supervision in March, 1943 in Area 8 of Upper Harlem. At that time only about one-third of the families had had public health nursing supervision less than one year. The sample was limited in size so that the nurses would feel free to make frequent visits to the family for teaching nutrition if it were thought necessary to do so. During the course of the study a total of thirteen families, or about 18 per cent, had to be dropped from the original sample for the following reasons: five moved and could not be located; five families were broken because of tuberculosis and the family members were living in various parts of the City; in two two-person families the wife was hospitalized and the husband was obtaining meals away from home; and for one family, nursing visits were discontinued at the request of the private physician who was in charge of the tuberculosis case in the family.

A food schedule was used to record for a seven-day period the family's habits of consumption of the types of food which are principal sources of the essential nutrients for a well-balanced diet. The amount of money spent for food in the same seven-day period was also recorded. These records were obtained from each family at monthly intervals and nutrition instruction was carried on for a period of three months, April to June, 1943. At the end of this period of special teaching, visiting in the families in the study was discontinued, except for emergencies, until October, when monthly visiting with special teaching was resumed for another three-month period. Thus, all families had the opportunity to have six months of special instruction in food habits.

The seven-day report on the use of different foods was designed

Harlem it was found that the mean average annual income in January, 1943 was 85 per cent above the mean income for 1940. The mean weekly expenditure for food increased 53 per cent in the same time period. The amount of money necessary for an estimated minimum-cost diet increased approximately 44 per cent.

to describe qualitative food habits of the family. The housewife was asked to give information as to the amount or frequency of use of specific foods during the seven-day period preceding the visit. The information for each type of food was as follows:

1. The amount of milk
2. The amount and kind of cheese
3. The number of eggs
4. The amount of butter or oleomargarine
5. Citrus fruits, times used
6. Tomatoes, times used
7. Other fruits, times used
8. Potatoes (white), times used
9. Vegetables, times used for each kind
10. Lean meat, poultry, or fish, kinds and times used
11. Dried beans or peas, times used
12. Bread and cereals, times used for each kind

As soon as a food schedule was obtained from the family the data for each food group were rated according to the following scale: "standard or above," "slightly below standard," "marginal," and "unsatisfactory."[4] Thus, the nurse had a guide as to where greatest emphasis was needed in the nutrition teaching in each family. Also, a nutritionist, experienced in nutrition teaching, acted as a consultant for the special study and gave assistance on any problems brought to her by the nurses.[5]

In April, 1944, one year after the start of the special teaching study, the families were visited again in order to obtain data on food habits at that time. It is possible, therefore, to study changes in the family food habits at two periods: (1) after three months of teaching with a three-months' rest period from teaching; and (2) after

[4] This rating was based on the standards recommended by the Food and Nutrition Board of the National Research Council. *See* Appendix 2.

[5] Mrs. Irene Fitzgerald, of the Nutrition Division of the Community Service Society, acted as consultant for the study. Miss Lucy Gillett, at that time director of the Nutrition Division, also gave valuable advice in the planning of the teaching study.

two three-month periods of teaching each followed by a three-month rest period from teaching. The three-month rest period from teaching was considered important in judging the effectiveness of teaching, because in that interval it was thought that the family might revert to old or usual food habits if the teaching had not been effective.

In an appraisal of the effectiveness of the nutrition teaching done by the nurses, it should be pointed out that the food schedules do not provide completely objective data independent of factors which may affect their validity for purposes of measurement. They are simply records containing information concerning the food habits of the family obtained by the public health nurse from the housewife. After teaching about any subject that includes putting into practice what is learned as the final test of learning, there is always difficulty in evaluation of the effectiveness of teaching unless practice is observed. In this special teaching study the food habits of the family were not observed after instructions concerning them were given, and the reports obtained by the nurses provide the only criteria available for judging the success of their teaching.

Description of the Families

Before the data on the use of different foods and the content and effect of the nutrition teaching are discussed, it will be of interest to describe certain characteristics of the families in the study. The housewife is usually the one responsible for the selection of the family food supply and it has been found that there is a relationship between the age of the housewife and the dietary pattern of the family. In a study of food habits of 943 white families living in the Eastern Health District of Baltimore, the best diets were recorded for families where the housewife was under 40 years of age and the poorest diets were those for families where the housewife was 60 years of age and over (3).

The distribution of the families according to the age of the house-

Age of Housewife	Per Cent	Number of Families
Total	100.0	60
Under 20 Years	0	0
20–24 Years	8.3	5
25–29 Years	10.0	6
30–34 Years	21.7	13
35–39 Years	15.0	9
40–44 Years	18.3	11
45–49 Years	11.7	7
50–59 Years	11.7	7
60 Years and Over	3.3	2

Table 1. Distribution of families according to age of housewife, Upper Harlem Area of New York City.

wife is shown in Table 1. In 55 per cent, the housewife was under 40 years of age; in 30 per cent, she was from 40 to 49 years of age; and in 15 per cent, she was 50 years of age or older. On the whole, the housewives in this study were relatively young. A considerable number of the families were of moderate or of small size. There were from two to four persons, only, in 78 per cent of the families, more than four persons in 17 per cent of the families, and only one person in 5 per cent of the families.[6]

Table 2 shows the distribution of the families according to their main source of income during the period April to June. The chief source of income for the majority of families, or 62 per cent, was earnings. Some of these families had other income in addition to earnings. "Other income" included rent from lodgers, Army service allotments, insurance, and contributions from relatives. For families receiving their income mainly through public assistance, the most usual sources were the Bureau of Home Relief and the Bureau of Child Welfare. Some of the families in this group also had "other income" in addition to public assistance.

[6] Lodgers have not been considered as a part of the family. Fifteen families, or 25 per cent, kept lodgers.

Main Source of Income	Per Cent of Families	Number of Families
Total	100.0	60
Earnings	61.6	37
Public Assistance:		
Home Relief	20.0	12
Bureau of Child Welfare	11.7	7
Old-Age Assistance	3.3	2
Community Service Society	1.7	1
Work Relief	1.7	1

Table 2. Distribution of families according to their main source of income, Upper Harlem Area of New York City, April to June , 1943.

The income of families depending upon public assistance was generally less than the income reported by families where income was derived from earnings and other nonrelief sources. Consequently, income is shown for two groups of families, those where the source of income was chiefly earnings and those who received some public assistance. Table 3 presents the average annual income per cost unit in the two groups of families during the two periods

Table 3. Average annual income of families classified according to main source of income during two three-month periods, Upper Harlem Area of New York City.

Period of Time and Main Source of Income	Mean Average Annual Income Per Cost Unit[2]	Standard Deviation σ	Number of Families[3]
April–June, 1943			
Earnings	$ 886±78.7	424.18	29
Public Assistance[1]	426±23.7	105.85	20
October–December, 1943			
Earnings	1,034±96.1	518.06	29
Public Assistance[1]	575±52.4	222.08	18

[1] Some families whose main source of income was through public assistance also had some income from other sources.

[2] Income is expressed in cost units because this method allows for the relative cost of maintenance of children and adults.

[3] Excluding families where amount of income is unknown.

of nutrition teaching.[7] In the period April to June, the mean average annual income for families with no public assistance was $886 per cost unit, compared with $426 in those receiving public assistance. In the second period, there was an increase of 17 per cent in income for the former group and 35 per cent for the latter group of families.[8]

The question may be raised as to whether or not the families were spending enough money for food to provide an adequate diet. A comparison of the average weekly food expenditure per cost unit in April with the minimum amount estimated as necessary at that time, is presented in Table 4. On the average, families of the same size were spending more than the minimum amount estimated as

Table 4. Average expenditure for food in families classified according to size of family, compared with an average minimum expenditure estimated as necessary to obtain a good diet, Upper Harlem Area of New York City, April, 1943.

Size of Family in Adult Cost Units	Average Expenditure For Food Per Week Per Cost Unit	Estimated Minimum Cost For Food Per Cost Unit Per Week[2]	Number of Families
One Person (0.85–1.00)	$4.71	$4.05	1
Two Persons Two Adults or One Adult and One Child[1] (1.39–2.21)	5.06	3.90	17
Three Persons or More (2.36–2.96)	4.66	3.30	24
(3.03 and Over)	4.44	3.10	17

[1] In a few instances, family includes one adult and two small children.

[2] The standard for the amount of money needed for food expenditure was obtained from the Table of Food Allowances, which is a part of the Schedule for Planning Budgets, issued by The Community Service Society for use by members of its staff. The Schedule for Planning Budgets is issued at intervals and takes account of changes in the cost of food and other items of living which are a part of the family budget. The Table of Allowances, dated January, 1943, was the one used as a standard for the data in this table.

In computing the average weekly amount of money needed for food, account was taken of the food requirements, by sex, of adults and of children of different ages.

These estimates are for normal conditions and are not those of families needing extra nourishment.

[7] Cost units were estimated by use of a food cost scale (per man, per day basis) which allows for the relative cost of maintenance of children and adults.

[8] In a previous report on a study of changes in income and food expenditures among tuberculous families in Harlem (2), the average annual income in the period December, 1942 to January, 1943, was estimated as $662 per cost unit. The average weekly food expenditure per cost unit was found to be $4.38 in January, 1943.

necessary for a diet of good quality. However, the expenditure of sufficient money for food does not necessarily mean that the diet will be a good one. A study of food habits of tuberculous families in Harlem in 1941 showed that in families where the food expenditures were equal to or more than the estimated amount necessary, 45 per cent had food habits which were considered as moderately or considerably below the recommended allowances (1). To obtain a good diet at minimum cost, knowledge of food values, of food requirements, and of proper preparation of foods to preserve nutritive values is essential. Careful management of the family budget and planned shopping for food are also required to obtain well-balanced meals for the family. These points were emphasized in the nurses' nutrition teaching.

Frequency in Use of Specific Foods

The reported frequencies in the use of specific food groups are presented for three weekly periods. The first period was in April, 1943, before special nutrition teaching had been started, the second period was in October, or six months later, and the third period was in April, 1944, a year after special teaching was started. These data are shown in Figures 1 and 2 and in the table in Appendix 1.

Milk. In the week before the first visit for special nutrition teaching, a high proportion of the families, or 88 per cent, reported using 3.5 quarts of milk or more per person per week. Only seven families, or 12 per cent of the total, used less than this amount. The high consumption of milk in these families, compared with surveys of other families, may be attributed to the fact that the use of milk in the diet has been constantly emphasized by the nurses in their supervision of tuberculous families.[9]

There was a considerable increase in the use of milk in April, 1944, or a year after special teaching was started. Only one family reported a use of milk which did not meet the standard allowance,

[9] In 318 white families (housewife under 40 years of age) in the Eastern Health District of Baltimore, 58 per cent reported that they used less than 3.5 quarts of milk per person per week.

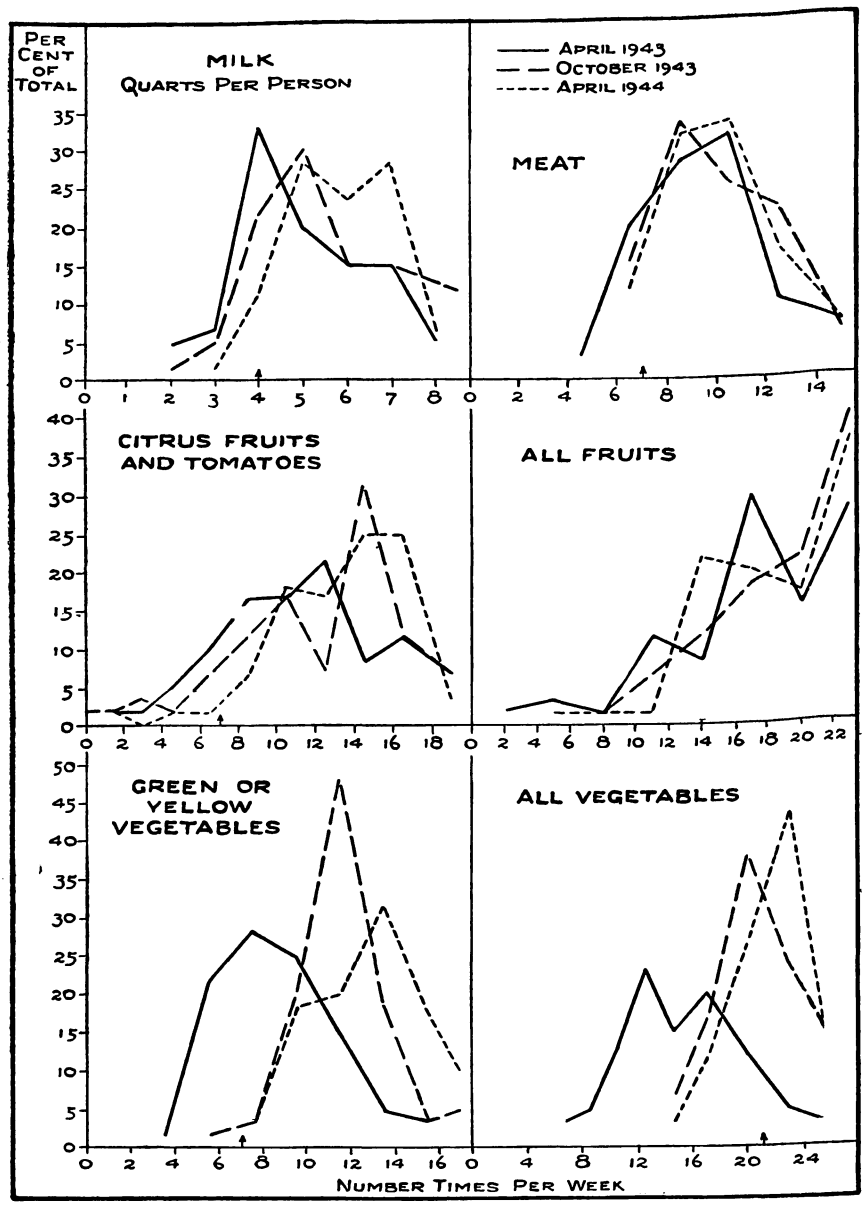

Fig. 1. Percentage distribution of diet records for sixty families in an area of Upper Harlem, New York City, according to the reported use of specific foods or food groups during one week in April and in October, 1943 and in April, 1944. (The arrow indicates the frequency of use which approximately corresponds to that in the recommended dietary pattern.) (For "all fruits" the arrow should be at 14 times per week.)

that is, less than 3.5 quarts per person per week. A large majority of the families, or 80 per cent, used between 4.5 and 7.4 quarts of milk per person per week.

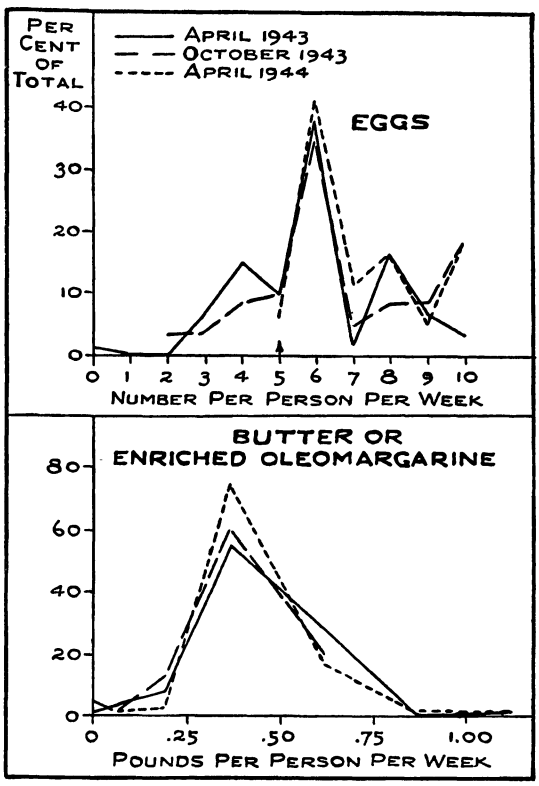

Fig. 2. Percentage distribution of diet records for sixty families in an area of Upper Harlem, New York City, according to the reported use of eggs and butter during one week in April and in October, 1943 and in one week in April, 1944. (The arrow indicates the frequency of use which approximately corresponds to that in the recommended dietary pattern.)

Meat. Lean meat, poultry, fish, or dried peas or beans were eaten at least once a day by most of the families at the time of the first visit. Only 3 per cent of the families had meat less than six times a week. Slightly more than three-fourths of the families had meat eight or more times a week. A year later, 88 per cent used meat eight or more times per week. It is interesting to note the increase in the use of meat and meat substitutes during a time of rationing.

Citrus Fruits and Tomatoes. In April, 1943 a high proportion of the families included citrus fruits and tomatoes in the diet as frequently as is recommended. Only 8 per cent of the families used citrus fruits and tomatoes less often than six times per week. Slightly more than one-fourth used these fruits twice a day or more often.

When the food records of the families for October were compared with the records for April, 1943, it was found that there was a

decrease of 36 per cent in the use of citrus fruits and an increase of 102 per cent in the use of tomatoes. Tomatoes, fresh and canned, were plentiful while citrus fruits, especially oranges, were scarce and expensive. This change is of interest because one aim of the public health nurse was to inform families about different foods of similar food value so that the quality of the family diet would not deteriorate due to the scarcity of certain essential foods.

In April, 1944 only two families had citrus fruits and tomatoes less often than six times a week. Fifty-three per cent of the families used citrus fruits and tomatoes fourteen or more times per week.

All Fruits. At the time of the first visit, April, 1943, all fruits, including citrus fruits and tomatoes, were consumed less than an average of twice a day in 18 per cent of the families. Slightly more than one-half of the families, or 53 per cent, had fruit two or three times a day and 28 per cent had fruit more than three times a day. In April, 1944 there was a considerable increase in the use of all fruits. Only 5 per cent of the families had fruit less than thirteen times a week.

Green or Yellow Vegetables. Twenty-three per cent of the families had green or yellow vegetables less than once a day in April, 1943. Six months later only one family used green or yellow vegetables less than once a day, and one year later no family was below standard in the use of green or yellow vegetables.

All Vegetables. In April, 1943 most of the families used less than three vegetables, including white potatoes, per day as recommended. Almost half of the families had vegetables less than twice a day. Vegetables were eaten nineteen or more times per week in only 20 per cent of the families. One year later, 85 per cent of the families reported a frequency in the use of vegetables of nineteen or more times per week. No family reported using vegetables less than fourteen times per week.[10]

[10] Green or yellow vegetables were included in all vegetables. Their substandard use by

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Eggs. At the beginning of the special study about one-fourth of the families used less than the recommended number, five eggs, per person per week. Twenty-eight per cent of the families averaged one egg a day or more per person. A year later all families used the recommended number of eggs.

Butter. Eighty-seven per cent of the families reported using at least one-quarter of a pound of butter or enriched oleomargarine per person per week in April, 1943. After teaching, the distribution of the families with respect to the use of butter did not change noticeably.

Whole Grain Cereal Foods. Although white bread and prepared cereals have been fortified with several vitamins and iron, some dark breads[11] and whole grain cereals have additional nutritive values and their use was recommended. Before the intensive teaching, 47 per cent of the families used dark bread at least once a day. Most of the families had some whole grain cooked cereal during the week. Seventeen per cent had it every day. At the end of the teaching study, 75 per cent of the families used dark bread once a day or more often, and 37 per cent had whole grain cereal every day. This signifies a considerable change in habits with regard to the use of dark bread and cereals.

On the charts in Figures 1 and 2 an arrow indicates the frequency of use of each food group which corresponds approximately to the recommended frequency of use. On the whole, the diets were usually better than the standard recommended. With the exception of the curve for the use of all vegetables in April, 1943, the areas

23 per cent of the families in April, 1943 had some effect on the amount of all vegetables used by the same families. The potato shortage in New York City during the spring months of 1943 also accounted for some of the inadequate use of all vegetables. A comparison of the food records of the families indicated that the frequency in use of white potatoes increased 47 per cent in October, 1943 and 51 per cent in April, 1944 as compared with their use in April, 1943.

[11] No account could be taken of the quality of the dark bread used by these families. Such breads are made largely of mixtures of whole wheat, or rye, and white flours in various proportions. Hence, many so-called dark breads do not measure up to the nutritional standard of enriched white bread.

under the curves and to the right of the arrow show that a large percentage of the families were using the various food groups as much as or more than the frequency recommended. In general, there was an increase in the use of the specific food groups in each period following the beginning of nutrition teaching.

Changes in Food Habits of Individual Families

A comparison of the use of various types of foods by the same families at two different periods, before and after special teaching of nutrition, may give some indication of the extent to which the family food patterns have been changed.

The change in the use of the specific food groups can best be described by a comparison of the mean differences in use of specific foods before and after special nutrition instruction was given. These data are shown in Table 5. For each comparison a distribution of "paired differences" was obtained by taking the difference between the values for use of a specific food in the two periods for

Table 5. Mean values for use of different groups of food in one week in April, 1943 and in April, 1944, difference between means for the two periods and standard deviations for distributions of difference in use in the two periods by specific families, Upper Harlem Area of New York City.

Specific Food and Measure of Use	Mean For One Week		Mean Difference	For Paired Differences	
	April, 1943 I	April, 1944 II	II–I	Standard Error of Mean Difference	Standard Deviation
Milk, Quarts Per Person	4.98	5.85	.87	±.20	±1.57
Butter, Pounds Per Person	.43	.43	.00	±.03	± .20
Eggs, Number Per Person	6.05	7.63	1.58	±.38	±2.91
Citrus Fruits and Tomatoes, Times Per Week	11.26	13.18	1.93	±.63	±4.91
All Fruits, Times Per Week	17.40	18.60	1.20	±.83	±6.44
Green or Yellow Vegetables, Times Per Week	8.67	12.95	4.28	±.41	±3.21
All Vegetables, Times Per Week	14.90	21.74	6.84	±.66	±5.14
Meat, Times Per Week	9.43	10.07	.63	±.44	±3.40

each family. The standard deviations of the distributions of these differences are shown in Table 5 and indicate the extent of the variation in frequency of use of the various foods by individual families. The significance of the difference between average values for the two periods is indicated by the standard errors of the means for the distribution of paired differences.

All foods except butter showed increases in their mean use. Except for the use of meat and "all fruits," the increases were statistically significant. The most marked increases were in the use of green or yellow vegetables and "all vegetables"; the mean differences were four and seven times per week, respectively. It is apparent that after a period of nutrition education the families showed considerable improvement in the frequency of use of specific foods.

Qualitative Classification of Food Habits

In order to summarize the dietary patterns of the families, the habits of use of selected foods were classified in a few categories based on the amount of deviation from a dietary pattern prepared by the Committee on Food and Nutrition of the National Research Council. For five food groups, namely, milk, eggs, citrus fruits and tomatoes, green or yellow vegetables, and meat, the habits of use were classified in one of four categories. The categories and the dietary pattern recommended are given in detail in Appendix 2. The category "standard or above" indicates a use equal to or above the recommended standard. "Slightly below standard" indicates a use slightly below the recommended standard. "Marginal" describes a use moderately below standard, and "unsatisfactory" a use considerably below standard.

By combining the ratings for each of the five types of foods, it is possible to get a composite rating which indicates the quality of each family food pattern. A diet was rated "standard or above" if the use of all five food groups met the recommended allowances. A diet was considered as "slightly below standard" if the use of any

food group was a little less than the recommended allowances but all other groups were a little less than, equal to, or more than, the standard recommended. A diet was "marginal" if the one or more food groups with the lowest rating were moderately below the recommended allowances. A diet was classified as "unsatisfactory" if the use of any of the five food groups was more than moderately below standard.

Ratings which are "slightly below standard" may indicate fairly satisfactory family food patterns. However, one aim of the nutrition teaching was to help improve the family food habits so that the dietary pattern would meet or be above the recommended pattern. Consequently, a family with a diet rated as "slightly below standard" was supposed to receive intensive teaching by the public health nurse, as did those classed as "marginal" or "unsatisfactory."

The composite ratings on family food habits for April, 1943 are compared with the ratings one year later. These data are presented in Table 6. In the seven-day period before the first visit, 42 per cent of the family diets were considered as "standard or above"; 47 per cent were rated "slightly below standard"; 8 per cent were "marginal"; and 3 per cent were "unsatisfactory." Ratings which are moderately or considerably below the recommended allowances

Table 6. Distribution of families according to the composite rating on food habits, Upper Harlem Area of New York City.

Classification of Food Habits	Per Cent			Number of Families		
	April, 1943	October, 1943	April, 1944	April, 1943	October, 1943	April, 1944
Total	100.0	100.0	100.0	60	60	60
Standard or Above	41.7	63.4	86.7	25	38	52
Slightly Below Standard	46.7	25.0	11.6	28	15	7
Marginal	8.3	8.3	0	5	5	0
Unsatisfactory	3.3	3.3	1.7	2	2	1

Classification of Food Habits	Per Cent of Families		Differences and Their Standard Errors	Number of Families	
	April, 1943	April, 1944		April, 1943	April, 1944
Standard or Above	41.7	86.7	45.0±8.8	25	52
Slightly Below Standard	46.7	11.6	−35.1±8.3	28	7
Marginal	8.3	0	−8.3±3.7	5	0
Unsatisfactory	3.3	1.7	−1.6±2.9	2	1

Table 7. Differences in composite ratings on food habits of sixty families, Upper Harlem Area of New York City, April, 1943 and April, 1944.

indicate definitely inadequate dietary patterns, and when the special teaching project was inaugurated, 12 per cent of the families had diets in this class. One year later, that is in April, 1944, the distribution of families is strikingly different. Eighty-seven per cent had a dietary pattern equal to or above the recommended standard and only 2 per cent were marginal or considerably below standard.

Obviously, these changes in ratings of food habits are significant and they may be tested statistically.[12] The differences between the first visit and the visit one year later in the ratings are presented in Table 7. The difference of 45.0 in the ratings of "standard or above" was five times its standard error 8.8. For ratings of "slightly below standard," the difference was −35, or four times its standard error. It is evident that in every classification presented, except "unsatisfactory," the difference was significant. It may be concluded that the improvement in the food habits of the families given intensive nutrition instruction was not due to chance variation. This indicates some measure of success in teaching.

Content of the Nurses' Teaching

The data presented thus far have shown that there was improve-

[12] The differences were tested by the use of the formula,

$$\sigma \text{ diff.} = \sqrt{pq\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

ment in the food habits of most of the families after the periods of nutrition teaching. It is of interest at this point to describe in some detail the general content of the special teaching given by the public health nurse and to indicate where emphasis in teaching was placed.

In their teaching the nurses emphasized the need for frequent use of specific foods in order to obtain a diet of good quality. Nutritive values of specific foods, including their vitamin and mineral content, were explained to the housewife. Instruction was given about the wisest selection of foods within each food group, both for nutritive values and for the best use of the food budget. There was teaching about the best neighborhood places to shop for food and about the wisest distribution and expenditure of the family supply of ration points. The care of food and methods of preparing food so as to prevent waste of nutritive values were discussed. To obtain more varied menus, different ways of preparing specific foods were suggested.

To obtain the best possible use of ration points the families were instructed to mix oleomargarine and butter, and to substitute cheese or dried peas and beans for meat occasionally. They were encouraged to include the highly nutritious organ meats in the diet and were given detailed information about the preparation of these meats. Suggestions were made to serve more milk by using it in puddings, custards, and cream dishes, and to serve fruit instead of rich pastry for desserts. Families were also advised to keep a stock of canned vegetables on hand for use when the prices of fresh vegetables were high.

When the food habits of the family were found to be equal to or better than the recommended standard, the nurse either did no teaching or reviewed the requirements of an adequate diet. These housewives were complimented because of their achievement and encouraged to continue to provide a good diet for the family.

After the general content of the nutrition teaching has been described, the question which quite naturally follows is: Was

Specified Food Groups	Total	Use of Specified Food Standard or Above at Beginning of Period		Use of Specified Food Below Standard at Beginning of Period	
		A Specific Teaching During Three-Month Period	B No Teaching	C Specific Teaching During Three-Month Period	D No Teaching
	Per Cent of Total Families				
	First Teaching Period				
Milk	100.0	26.7	61.6	11.7	0
Butter	100.0	11.7	75.0	11.7	1.6
Eggs	100.0	13.3	63.4	18.3	5.0
Fruits	100.0	28.3	53.4	18.3	0
Vegetables	100.0	11.7	6.7	56.6	25.0
Meat	100.0	28.3	48.3	16.7	6.7
Cereals and Bread	100.0	21.6	25.0	26.7	26.7
	Second Teaching Period				
Milk	100.0	40.0	53.3	6.7	0
Butter	100.0	11.7	68.3	18.3	1.7
Eggs	100.0	18.3	66.7	13.3	1.7
Fruits	100.0	38.3	48.4	13.3	0
Vegetables	100.0	55.0	20.0	25.0	0
Meat	100.0	8.3	76.7	5.0	10.0
Cereals and Bread	100.0	13.3	63.4	5.0	18.3
	Number of Families				
	First Teaching Period				
Milk	60	16	37	7	0
Butter	60	7	45	7	1
Eggs	60	8	38	11	3
Fruits	60	17	32	11	0
Vegetables	60	7	4	34	15
Meat	60	17	29	10	4
Cereals and Bread	60	13	15	16	16
	Second Teaching Period				
Milk	60	24	32	4	0
Butter	60	7	41	11	1
Eggs	60	11	40	8	1
Fruits	60	23	29	8	0
Vegetables	60	33	12	15	0
Meat	60	5	46	3	6
Cereals and Bread	60	8	38	3	11

Table 8. Distribution of families in each teaching period according to rating and instruction given for each food group, Upper Harlem Area of New York City.

specific teaching done in families where the need for such teaching was greatest? Table 8 shows for each food group (1) the families in which the use of the specified foods was standard or above, and (2) those in which the use was below standard at the beginning of each study period. In each of these two groups the families are classified according to whether there was teaching or no teaching concerning the specific foods. For example, in the first teaching period, no families below standard in the use of milk failed to receive teaching concerning the need for milk in the diet.

Column D in Table 8 indicates where there was a lack of teaching, though a need was indicated because the use of the food group was below standard. During the first teaching period 25 per cent of the families received no instructions about the need for increased use of vegetables, and 26 per cent received no teaching about the advisability of including dark bread or whole grain cereals in the diet. On the other hand, there were families given instructions about the use of each food group where need for such instruction was not indicated (Column A).

During the second teaching period fewer families failed to receive instruction about the use of specific foods where there was need for such instruction. The greatest change in this respect was in teaching about the importance of vegetables in the diet. No family needing such instruction failed to receive it. There were eleven families, or 18 per cent of the total number, where no teaching concerning the value of whole grain cereals and dark bread in the diet was done. These families were below standard with respect to this food group. Perhaps less emphasis was placed upon teaching the importance of dark bread and cereals in the diet because of the knowledge that the nutritive value of white bread has been improved through enrichment.

In the special teaching program the families received what may be termed "general nutrition instruction" as well as teaching about specific food groups. Table 9 shows the content of the "general

nutrition teaching" and the number of families receiving such teaching during the period April-June, 1943. Thirty-five per cent of the families had no "general teaching." Forty-seven per cent of the families were taught concerning the best use of the money available for food; in 13 per cent advice was given about the best use of ration points; and in 8 per cent the housewife was encouraged to estimate the family food needs before shopping for food. The importance of well-balanced meals, including instruction as to what constitutes a good breakfast and a good luncheon, was explained to 10 per cent of the families. Four families were given general information about the care and preparation of food to preserve nutritive values. It is apparent that "general nutrition teaching" consisted chiefly of advice concerning the economic problems of the family.

Tables 8 and 9 have shown that with certain exceptions the nutrition teaching in the sixty families was done on a selective basis. On the whole, families needing advice about the use of specific foods were given such advice.

The results of the teaching experiment described in this report

Table 9. Content of "General Nutrition Teaching" in sixty families, Upper Harlem Area of New York City, April to June, 1943.

Content of General Teaching	Per Cent of Total	Number of Families
No General Teaching	35.0	21
Teaching Concerning:[1]		
Well-Balanced Meals	10.0	6
Wise Expenditures for Food	46.7	28
Family Food Budget	8.3	5
Best Use of Ration Points	13.3	8
Estimating Food Needs Before Marketing	8.3	5
Care and Preparation of Food to Preserve Nutritive Values	6.7	4

[1] Families with teaching in more than one classification of general teaching are included in each classification in which they had teaching.

indicate a high degree of success because there was a significant improvement in the food habits of the families. This was true even though the level of the food habits in some families was relatively high at the beginning of the experiment. It is apparent that more was accomplished through a program of special nutrition teaching than resulted from nutrition teaching which was a part of the usual nursing program in these families. Also, the maximum improvement was noted after six months of special instruction. To bring about these results, the nurses usually made one visit to the family in each of the six months; more than one visit per month was made in only five of the sixty families.

Families with a serious health problem, such as tuberculosis, probably are most receptive to teaching about the importance of nutrition for the maintenance of good health. Because of exposure to infection, their family members form a group especially liable to future illness and disability. It is hoped, therefore, that in public health nursing programs, considerable emphasis will be placed upon teaching better food habits in all such families when the dietary pattern indicates need for teaching. The experiment reported here has shown this to be a feasible program.

Summary

An experiment in nutrition teaching by public health nurses was carried on in sixty tuberculous families in an area of Upper Harlem in 1943. The reported use of each of five foods or food groups was compared with amounts recommended in the dietary pattern prepared by the Food and Nutrition Board of the National Research Council. The data are presented for two periods: (1) after three months of special teaching, and (2) after two three-month periods of teaching.

Comparison of the use of various types of foods by the same families at two different periods (before and after teaching) indicated a significant increase in the use of specific foods after teaching.

The greatest increases were noted in the use of green or yellow vegetables and of "all vegetables."

From study of the content of the nurses' nutrition teaching it was concluded that on the whole the teaching in the sixty families was done on a selective basis. Most families needing advice about the use of specific foods were given such advice.

It is hoped that in public health nursing programs considerable emphasis will be placed upon improvement of food habits in families with a serious health problem, such as tuberculosis, when the dietary pattern indicates need for teaching. The experiment reported upon here has shown this to be a feasible program.

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APPENDIX I

Distribution of families according to frequency of use of specified foods per week, Upper Harlem Area of New York City.

	PER CENT			NUMBER OF FAMILIES		
	April, 1943	October, 1943	April, 1944	April, 1943	October, 1943	April, 1944
	MILK (QUARTS PER PERSON PER WEEK)					
TOTAL	100.0	100.0	100.0	60	60	60
1.5–2.4	5.0	1.7	0	3	1	0
2.5–3.4	6.7	5.0	1.7	4	3	1
3.5–4.4	33.3	21.6	11.7	20	13	7
4.5–5.4	20.0	30.0	28.3	12	18	17
5.5–6.4	15.0	15.0	23.3	9	9	14
6.5–7.4	15.0	15.0	28.3	9	9	17
7.5–8.4	5.0	6.7	6.7	3	4	4
8.5 or More	0	5.0	0	0	3	0
	LEAN MEATS (TIMES PER WEEK)					
TOTAL	100.0	100.0	100.0	60	60	60
0	0	0	0	0	0	0
1	0	0	0	0	0	0
2 or 3	0	0	0	0	0	0
4 or 5	3.3	0	0	2	0	0
6 or 7	20.0	15.0	11.7	12	9	7
8 or 9	28.3	33.3	31.7	17	20	19
10 or 11	31.7	25.0	33.3	19	15	20
12 or 13	10.0	21.6	16.7	6	13	10
14 or 15	5.0	1.7	3.3	3	1	2
16 or 17	1.7	1.7	3.3	1	1	2
18 or More	0	1.7	0	0	1	0
	CITRUS FRUITS AND TOMATOES (TIMES PER WEEK)					
TOTAL	100.0	100.0	100.0	60	60	60
0	0	1.7	0	0	1	0
1 or 2	1.7	1.7	1.7	1	1	1
3	1.7	3.3	0	1	2	0
4 or 5	5.0	1.7	1.7	3	1	1
6 or 7	10.0	6.7	1.7	6	4	1
8 or 9	16.6	11.6	6.7	10	7	4
10 or 11	16.6	16.6	18.3	10	10	11
12 or 13	21.7	6.7	16.6	13	4	10
14 or 15	8.3	31.7	25.0	5	19	15
16 or 17	11.7	11.6	25.0	7	7	15
18 or More	6.7	6.7	3.3	4	4	2

	Per Cent			Number of Families		
	April, 1943	October, 1943	April, 1944	April, 1943	October, 1943	April, 1944
	ALL FRUITS (TIMES PER WEEK)					
Total	100.0	100.0	100.0	60	60	60
0	0	0	0	0	0	0
1 to 3	1.7	0	0	1	0	0
4 to 6	3.3	0	1.7	2	0	1
7 to 9	1.7	1.7	1.7	1	1	1
10 to 12	11.7	6.7	1.7	7	4	1
13 to 15	8.3	11.6	21.6	5	7	13
16 to 18	30.0	18.3	20.0	18	11	12
19 to 21	15.0	21.7	16.6	9	13	10
22 or More	28.3	40.0	36.7	17	24	22
	GREEN OR YELLOW VEGETABLES (TIMES PER WEEK)					
Total	100.0	100.0	100.0	60	60	60
0	0	0	0	0	0	0
1 or 2	0	0	0	0	0	0
3 or 4	1.7	0	0	1	0	0
5 or 6	21.7	1.7	0	13	1	0
7 or 8	28.3	3.3	3.3	17	2	2
9 or 10	25.0	20.0	18.3	15	12	11
11 or 12	15.0	48.4	20.0	9	29	12
13 or 14	5.0	18.3	31.7	3	11	19
15 or 16	3.3	3.3	16.7	2	2	10
17 or 18	0	3.3	8.3	0	2	5
19 or More	0	1.7	1.7	0	1	1
	ALL VEGETABLES (TIMES PER WEEK)					
Total	100.0	100.0	100.0	60	60	60
0– 3	0	0	0	0	0	0
4– 5	0	0	0	0	0	0
6– 7	3.3	0	0	2	0	0
8– 9	5.0	0	0	3	0	0
10–11	13.4	0	0	8	0	0
12–13	23.3	0	0	14	0	0
14–15	15.0	6.7	3.3	9	4	2
16–18	20.0	16.7	11.7	12	10	7
19–21	11.7	38.3	26.7	7	23	16
22–24	5.0	23.3	43.3	3	14	26
25 or More	3.3	15.0	15.0	2	9	9

	Per Cent			Number of Families		
	April, 1943	October, 1943	April, 1944	April, 1943	October, 1943	April, 1944
	Eggs (number per person per week)					
Total	100.0	100.0	100.0	60	60	60
0–0.4	1.7	0	0	1	0	0
0.5–1.4	0	0	0	0	0	0
1.5–2.4	0	3.3	0	0	2	0
2.5–3.4	6.7	3.3	0	4	2	0
3.5–4.4	15.0	8.3	0	9	5	0
4.5–5.4	10.0	10.0	6.7	6	6	4
5.5–6.4	38.3	35.1	41.7	23	21	25
6.5–7.4	1.7	5.0	11.7	1	3	7
7.5–8.4	16.6	8.3	16.6	10	5	10
8.5–9.4	6.7	8.3	5.0	4	5	3
9.5 or More	3.3	18.4	18.3	2	11	11
	Butter or enriched oleomargarine (pounds per person per week)					
Total	100.0	100.0	100.0	60	60	60
No Butter	1.7	5.0	0	1	3	0
Less Than .125 lbs.	3.3	1.7	1.7	2	1	1
.125–.24 lbs.	8.3	13.3	3.3	5	8	2
.25 –.49 lbs.	56.7	60.0	75.0	34	36	45
.50 –.74 lbs.	28.3	20.0	16.6	17	12	10
.75 –.99 lbs.	0	0	1.7	0	0	1
1.00 or More	1.7	0	1.7	1	0	1
	Dark bread and cereals (times per day)					
Total	100.0	100.0	100.0	60	60	60
Dark Bread						
None	26.7	11.7	18.3	16	7	11
Less Than Once a Day	26.7	8.3	6.7	16	5	4
Once a Day	31.6	28.3	28.3	19	17	17
Twice a Day	11.7	23.4	26.7	7	14	16
Three or More Times a Day	3.3	28.3	20.0	2	17	12
Dark Cooked Cereal						
None	15.0	10.0	6.6	9	6	4
Less Than Once a Day	68.3	63.3	56.7	41	38	34
Once a Day	16.7	26.7	36.7	10	16	22

Appendix 2

Description of qualitative classes used in rating weekly food records:

1. *Rating for Milk Used Per Person Per Week*
   - Standard or Above — 4 quarts or more
   - Slightly Below Standard — 3 quarts
   - Marginal — 2 quarts
   - Unsatisfactory — 1 quart or less
2. *Rating for Eggs Used Per Person Per Week*
   - Standard or Above — 5 eggs or more
   - Slightly Below Standard — 3 or 4 eggs
   - Marginal — 2 eggs
   - Unsatisfactory — 1 or no eggs
3. *Rating for Times Citrus Fruits and Tomatoes Used Per Week*
   - Standard or Above — 6 times or more
   - Slightly Below Standard — 4 or 5 times
   - Marginal — 3 times
   - Unsatisfactory — 2, 1, or no times
4. *Rating for Times Green and Yellow Vegetables Used Per Week*
   - Standard or Above — 7 times or more
   - Slightly Below Standard — 5 or 6 times
   - Marginal — 3 or 4 times
   - Unsatisfactory — 2, 1, or no times
5. *Rating for Times Lean Meat, Fish, or Fowl Used Per Week*
   - Standard or Above — 8 times or more
   - Slightly Below Standard — 6 or 7 times
   - Marginal — 4 or 5 times
   - Unsatisfactory — 3, 2, 1, or no times
6. *Composite Rating for Five Food Groups*
   - Standard or Above — 5 ratings standard or above
   - Slightly Below Standard — 1 or more ratings slightly below standard, no rating marginal or unsatisfactory
   - Marginal — 1 or more ratings marginal, no rating unsatisfactory
   - Unsatisfactory — 1 or more ratings unsatisfactory

When cheese was needed to meet the recommended allowances for milk, it

was considered as a milk substitute. When the milk requirement was met with some of the cheese used, the rest of the cheese was considered as a meat substitute. All of the cheese used was considered as a meat substitute when the milk requirement was met without the use of cheese.

Procedure for using cheese as a milk substitute (based on values for calcium):

1. 1 lb. of cottage cheese = 1 pt. of milk
2. 5 ounces of cheese (other than cottage cheese) = 1 qt. of milk

Procedure for using cheese as a meat substitute (based on protein values):

1. 2 ounces of cheese (other than cottage cheese) = 1 serving of meat
2. 3 or 4 ounces of cottage cheese = 1 serving of meat

Procedure for using dried peas or beans as a meat substitute:

1 serving of dried peas or beans = 1 serving of meat

The dietary pattern to meet recommended allowances outlined by the Food and Nutrition Board of the National Research Council is as follows:

Milk, adults—1 pt. daily; children—1 qt. daily
Vegetables—2 servings daily—1 green or yellow
Fruit—2 servings daily—1 citrus or tomato and 1 other
Eggs—3 or 4 times per week
Meat—1 serving daily
Whole grain or "enriched" cereal and bread—at least half the intake
Butter or fortified oleomargarine (100-500 calories)
Potato—1 or more servings daily