MEDICAL EVALUATION OF NUTRITIONAL STATUS[1]

VII. DIETS OF HIGH SCHOOL STUDENTS OF LOW-INCOME FAMILIES IN NEW YORK CITY

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NUTRITION problems of high school students have received little attention from public health and school officials although, at these ages, children are likely to experience serious nutritional deficiencies. Dietary requirements for this age group are higher for most nutrients than at any other period of life, and an optimal intake of those nutrients which are of special importance requires careful choice of foods based on knowledge of food values. An investigation of nutritional status of a group of high school students in a low-rent area of New York City has shown that nearly all of those examined had one or more mild deficiency diseases which could be diagnosed by special tests. This investigation and the tests have been described and results on special phases have been published (1, 2, 3, 4, 5, 6). Several dietary surveys in Canada (7, 8, 9, 10) in which individual intake of food was measured showed that large percentages of adolescent children failed to consume enough of the right foods to provide for their extra food requirements. Such findings point to a need for further study of the nutritional deficiencies of high school students and also to the importance of developing measures to improve the dietary habits of this group.

Diet histories were obtained between April, 1939 and February, 1940 for over 2,000 high school pupils who were examined in the

[1] This paper is the seventh of a series from a cooperative investigation by the New York City Department of Health; the United States Public Health Service, Division of Public Health Methods; the Cornell University Medical College, Department of Public Health and Preventive Medicine and Department of Pediatrics; and the Milbank Memorial Fund.

The cooperating agencies have been assisted in carrying out this investigation by the Work Projects Administration for the City of New York, Official Project No. 65-1-97-21, W.P. 24, "Medical Evaluation of Nutritional Status."

nutrition investigation already mentioned. This Study in the lower East Side district of New York City was a cooperative investigation on Medical Evaluation of Nutritional Status conducted by the United States Public Health Service, Cornell University Medical College, the Milbank Memorial Fund, and the New York City Department of Health with assistance from the Work Projects Administration. The diet histories were collected to provide information on the level of food consumption and on dietary habits which could be used to assist in interpreting other nutrition findings. Data from these individual diet histories are analyzed for this report for the purpose of showing the frequency with which specific nutritive values in the diets were below allowances recommended to ensure good nutritional status.

Description of the Sample

The pupils in this Study were all attending a large public high school of New York City situated in the lower East Side of Manhattan. A large majority of them lived in this area, but a considerable number resided in Brooklyn and other sections of the City. The district is a low-rent neighborhood and the pupils surveyed were predominantly from low-income families. Information obtained in the home, usually from the pupil's mother, included data on family income during preceding months and on size of family. The distribution of weekly income per capita for the families is shown in Table 1. One-fourth of the families reported a weekly income of less than $4.00 per capita, 53 per cent less than $6.00 weekly per capita, and only 13 per cent reported a weekly income of $10.00 or more per capita. Eight per cent of the pupils came from families on WPA and an additional 24 per cent were from families receiving some assistance from a public or private agency, chiefly from the Home Relief Bureau or the NYA.

Both parents of about three-fourths of the pupils were foreign born, and both parents of only 5 per cent were born in the United States. Seventy-two per cent of the group were Jewish and the

Relief Status and Income	Per Cent of Total	Number
Total	100.0	2,037
Relief		
WPA	8.0	163
All Other	23.9	508
Nonrelief	68.1	1,366
Total Known Income Weekly Per Capita	100.0	1,826
Less Than $4.00	24.9	455
$4.00–5.99	28.4	519
$6.00–9.99	33.2	607
$10.00 or More	13.4	245

Table 1. Weekly income per capita and relief status of families with children for whom three or four-day diet histories were obtained between April, 1939 and February, 1940 in New York City.

majority of these were orthodox; 14.5 per cent were of Italian descent.

Description of Diet Records

Method of Collection. Diet histories used as a basis of the data presented here were collected by the interview method and were of two types: first, a history obtained by a home visitor from the mother or person who prepared the meals; second, a history taken from the child at the clinic operated by the Study.

The record taken in the home was an itemized statement of foods used by the family at each meal and between meals during the two days preceding the visit of the interviewer. The schedule used for recording this information is reproduced in Appendix I. Each food was described and homemade dishes prepared from several foods were described in detail and the recipe recorded. Quantities of each food were recorded on the schedule after careful questioning. For many items, the quantity reported was the amount purchased with added information as to how much of this amount was consumed in the two-day period. Wherever possible, units of weight or volume were obtained, as pounds or quarts, but household measures, such as measuring cups, tablespoons, etc. also were used. Packaged and

canned goods were identified by brand and price, and volume was obtained from the label, either in the home or by visiting a neighborhood store.

Individual histories for the children receiving the nutrition examination were considered essential. Therefore, the informant in the home was asked to describe as accurately as possible the share of the family food which was consumed by the child in the Study. The portions for the child were described usually in one of three ways: by units, such as two rolls, one chop, two glasses of milk; by servings, such as a sauce dish of stewed fruit, a cupful of cooked cereal; and by shares of the total family supply. In the latter case, the informant frequently indicated the number of servings obtained, and the number of these servings consumed by the child.

The diet histories taken at the Study Clinic were for a two-day period for slightly more than one-half of the pupils and were for only a day for the remainder. The schedule for the pupil record is shown in Appendix II. Since the pupil may be expected to find it difficult to give a definite idea of the size of servings, or quantities consumed, moulages[2] of measured quantities of certain items of food were displayed on the interviewers' desks, and typical cups, dishes, and bowls were also at hand. These were used as standards of reference and the pupil was asked to estimate the amounts of different foods consumed in relation to some one of the sample servings or dishes. The pupil was questioned carefully and encouraged to state whether the quantity was more or less, and how much more or less than one of the samples selected for comparison. In addition to the dietary information, the pupil was asked questions relative to his food habits and activity, including school and home work or recreation.

These diet histories, both the family and the pupil interview record, provide only approximate quantitative values of the level

[2] These models were prepared by Miss E. Lipman for the Department of Public Health, Cornell University Medical College.

of food consumption. It was not possible to obtain records for such a large number of individuals by the more accurate method of weighing the food consumed. It was decided that a good qualitative history with approximate estimates of quantity for every child would serve the purpose of the Study better than more accurate records for a few of the children. The diet histories were desired chiefly to provide data to assist in interpreting the causes of such nutritional deficiency diseases as might be diagnosed by medical tests. No deductions concerning a child's nutritional status were to be based on diet histories alone. However, wide differences in the consumption levels for individual children are indicated by these diet histories, and the quantitative estimates are sufficiently accurate to describe these differences and to classify children in broad groups according to their intake.

Method of Estimating Specific Nutrients in the Diet. For the individual diet histories obtained in the home and for those obtained from the pupil, computations were made independently for calories, protein, calcium, iron, vitamin A, thiamin or vitamin B_1, ascorbic acid, and riboflavin or vitamin B_2 in the foods.[8] However, in many cases the mother was unable to report what the child had eaten for lunch, since it was obtained at school on one or both days included in the history. In all such cases, the nutrient values of the lunches reported by the pupil were added to those computed for the food consumed at home to obtain complete two-day records, although the pupil record was for different days. Finally, the total value for each nutrient determined from the family report was combined with the total determined from the pupil report, and an average daily intake of each nutrient was calculated. The average daily values for this report are based on records for either three or four days, two days reported by the mother and one or two days by the pupil.

[8] Vitamin D content of food was not computed. Although vitamin D is essential to the nutrition of adolescents, it may be provided by exposure to sunshine as well as by foods, and information on the latter source only is of limited value.

Since there was a wide variety of foods reported, both natural and prepared, it was necessary to use food values from many sources and, in some instances, to estimate values using known values for other foods of the same general variety or, for prepared dishes, using such information as could be obtained on content. The pupils reported largely in terms of prepared dishes and, for these, recipes given by the Jewish and Italian mothers to the home visitors were used for estimating content. Food values were taken chiefly from publications of the Department of Agriculture (11), from Rose (12), Sherman (13), and Munsell (14), but other sources also were used for some values. Vitamin values determined by comparable assay methods are available for only a limited number of foods, and reported values have been expressed in different units. Vitamin A values are given in this report in International units, and values derived from tables expressed in Sherman-Munsell units were converted by multiplying by 0.7. Thiamin content of diets is given in International units of Vitamin B_1 and the Sherman-Chase unit of B_1 has been taken as equivalent. One milligram of thiamin has been counted as equivalent to 333 International units. Data on riboflavin content of foods were taken from tables giving values expressed as vitamin G or B_2 and the estimated diet values are given as Sherman-Bourquin units of vitamin G. The recommended allowances for riboflavin were converted to units of vitamin G by counting one mg. of riboflavin equivalent to 400 units, as suggested by Sherman (15).

The error in estimating the nutritive value of a diet from average values for specific food items is very large. Season, duration of storage, geographic region in which food was grown, and methods of cooking or canning affect the nutritive content. For many foods, vitamin content has not been assayed by the most reliable methods and differences between reported values often are extremely large. The magnitude of errors introduced by the average values used cannot be estimated. In spite of these limitations, nutritive values de-

rived from these dietary histories furnish useful and significant information. In the first place, the average values used for individual foods may be expected to be too high for some and too low for others and, therefore, errors are to some extent compensating. Thus, the total nutrient value calculated for a complete diet history for three or four days will have a much smaller error than the error in the nutrient values assigned to individual food items. Secondly, the same average values for specific foods are used for every record and this tends to level out or eliminate differences between individual diets which may arise from better methods of cooking or handling foods, and from seasonal or other variations in the nutritive value. In general, the process of determining total nutrient values for individual histories tends to minimize the differences between them and reveals chiefly the effect on the consumption level of differences in food choices and quantities of various food items included in the diet. The differences reflected in the nutrient estimates are those of particular significance and interest in evaluating dietary habits and the qualitative adequacy of diets.

The accuracy of the quantitative values presented in this report for individual pupils can be described as good approximations. Some records no doubt were affected by general underestimates or overestimates of the quantities of foods consumed but, on the whole, it is believed that the estimates were carefully made and were mostly of the compensating type which tend to average out in totals for a period of several days. Absolute total values for specific nutrients may be somewhat too high for some nutrients and too low for others as a result of the tables of average food values used; but differences between nutritive levels for the pupils are real and indicative of marked variation in the relative levels of consumption.

Evaluation of Adequacy of Diet

Energy Value Requirements. For each child in the Study, an estimate of the calories needed per day was calculated from body measurements and information on the amount and type of activity

of the child. From height and weight measurements, the number of square meters of surface area was read from a chart published by Dubois (16), and the basal calorie requirement per square meter per hour for a boy or girl of a given age was taken from a table prepared by Boothby, Berkson, and Dunn (17). From the pupil's report on time devoted to various pursuits during the period for which the diet history was obtained, additional calorie needs were estimated, using four levels of activity. Requirements for sedentary hours, such as meal time and classroom periods, were placed at 40 per cent more than basal; for light exercise, such as dressing and walking, at 150 per cent more than basal; for moderate exercise such as playing hand ball or working as a delivery boy, at 280 per cent; and for violent exercise, such as football, basketball, and dancing, at 600 per cent. The hours of violent exercise were conservatively estimated as only a fraction of the time spent on the football field or at a dance. The calories needed for the total energy output were added to the basal requirements for twenty-four hours and from this a deduction was made of 12 per cent of basal calories for the number of hours of sleep. This net total calorie requirement per day was increased 13 per cent to allow for digestive waste and for growth.

The average estimated calorie requirements for this group of boys and girls was: girls 13-15 years of age, 2,505 calories per day; girls 16-19 years of age, 2,389 calories per day; boys aged 13-15 years, 3,244 calories; and boys aged 16-19 years, 3,380 calories. These averages for the younger girls and the older boys are somewhat lower than the average calorie allowances recommended by the Committee on Food and Nutrition, National Research Council (18); and for the other groups are almost identical with the recommended average allowance. There were very wide differences in the estimates of calories required by the individual child. The range for girls was from 1,800 to 4,150 calories, and for boys from 1,850 to 5,350 calories per day.

Nutrient Requirements. For all nutrients, other than calories, the evaluation of adequacy in the present report is based on the daily allowances recommended by the National Research Council Committee. These allowances are as follows:

	Protein gms.	Calcium gms.	Iron mg.	Vitamin A Int. Units	Thiamin B_1–I.U.[1]	Riboflavin S-B Units-G[2]	Ascorbic Acid-mg.
Girls:							
13–15 Years	80	1.3	15	5,000	466	800	80
16–20 Years	75	1.0	15	5,000	400	720	80
Boys:							
13–15 Years	85	1.4	15	5,000	533	960	90
16–20 Years	100	1.4	15	6,000	666	1,200	100

[1] Recommendation for mg. of thiamin converted to International units of B_1 at 333 I.U. per mg.

[2] Recommendation for mg. of riboflavin converted to Sherman-Bourquin units of G at 400 per mg.

There are differences in individual requirements for these nutrients but, in view of the limited knowledge of nutritive requirements and the necessity of using approximate allowances, these recommended allowances for sex-age groups have been used as the basis for rating the adequacy of the supply of specific nutrients in the food consumed.[4] The quantities recommended provide "a reasonable margin of safety" which seems essential to assure complete and constant protection.

Nutritive Values of Reported Diets in Relation to Allowances

The percentages of pupils of each sex and in each age group whose reported diet furnished less than the allowances recommended for the corresponding sex-age group are shown in Figure 1 and Table 2 for each nutrient. In order to show the frequency of diets which were markedly deficient, there are given also the per-

[4] It has been established that the requirement for thiamin is proportional to the caloric intake, and it has been suggested that a similar relationship holds for riboflavin. Requirements for most nutrients probably vary to some extent in relation to weight or body size. An evaluation of the nutritive level of diets of these pupils on an individual basis is in progress.

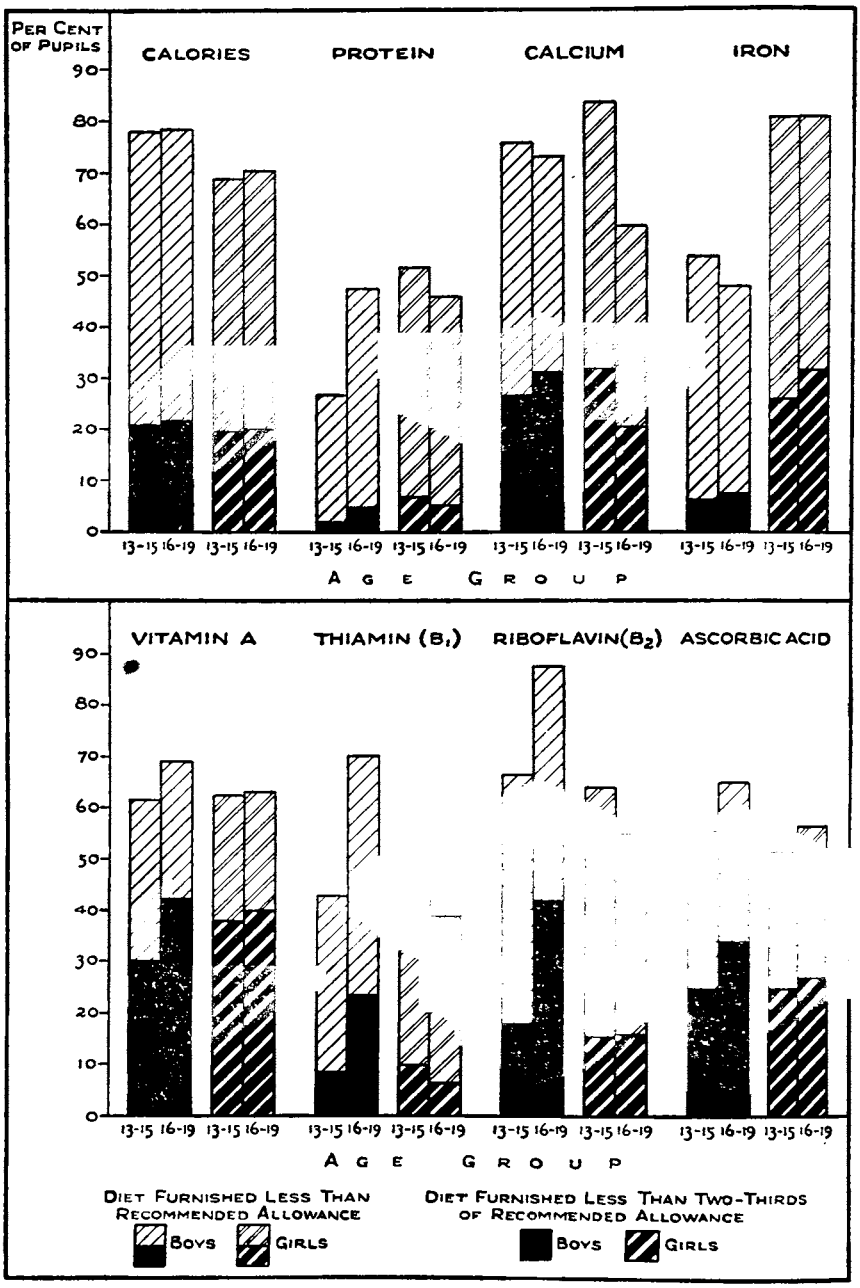

Fig. 1. Percentages of pupils whose reported diets furnished less than estimated calorie requirements and less than recommended average allowances for specific nutrients; also percentages with diets deficient by more than one-third of allowances.

Nutrient	Boys			Girls			Both Sexes
	All Ages	13-15 Years	16-19 Years	All Ages	13-15 Years	16-19 Years	13-19 Years
	PER CENT OF GROUP HAVING LESS THAN DAILY ALLOWANCE						
Calories	78	78	78	70	69	70	74
Protein	40	27	47	49	52	46	44
Calcium	74	75	73	71	84	59	72
Iron	50	54	48	81	80	81	64
Vitamin A	66	61	69	63	63	63	65
Thiamin (B_1)	60	43	70	44	51	39	53
Riboflavin (B_2)	80	66	88	59	64	55	70
Ascorbic Acid	62	56	65	54	51	56	58
	PER CENT OF GROUP HAVING LESS THAN TWO-THIRDS OF ALLOWANCE						
Calories	22	21	22	20	20	20	21
Protein	4	2	5	6	7	6	5
Calcium	29	27	31	25	31	20	28
Iron	7	6	7	29	26	32	17
Vitamin A	38	30	42	39	38	40	38
Thiamin (B_1)	18	8	23	8	10	6	14
Riboflavin (B_2)	33	18	42	16	15	16	25
Ascorbic Acid	31	25	34	26	25	27	29
Number of Pupils	1,104	404	700	933	433	500	2,037

Table 2. Percentages of pupils whose daily intake of various nutrients was less than the sex-age specific allowances and percentages with an intake of less than two-thirds of the allowances. Daily intake of pupils was based on average daily quantities from three or four-day individual histories.

centages of each group of pupils with an average daily intake which was more than one-third less than the recommended quantity.

The high percentages of boys and girls who had less than their estimated calorie requirements is a finding of considerable interest. Among boys, 78 per cent and among girls, 70 per cent were on a food-consumption level below estimates of their individual energy need. Many other studies have shown low caloric values for family food supplies. Stiebeling and Phipard (19) reported that 46 per cent of 253 families of wage-earners in the North Atlantic States had less than the estimated calorie requirements, although they spent from $2.50 to $3.12 weekly per capita; and at lower expendi-

ture levels, the caloric value of the food supply was much lower. A study of low-income families in Toronto, reported on by McHenry (7), in which the food consumed by individual members of the family was weighed, showed that the energy value of food consumed by children 11 to 18 years of age averaged only 73.9 per cent of their sex-age specific allowances. Dietary records collected in Quebec (9) for individual family members showed 65 per cent of boys and 60 per cent of girls aged 11 to 18 years were on a calorie intake below estimated needs; and in a similar survey in Edmonton (10), 64 per cent of children aged 12-18 years had diets deficient in calories. There is much evidence that low calorie diets are common among working-class families, and the question of the extent of food-energy deficiencies seems to need careful evaluation. Such diets may be expected to produce deficiencies in other elements unless the selection of foods is very wisely made.

It is clearly shown in Figure 1 that the diets of large percentages of these high school pupils furnished insufficient quantities of the various food elements. More of the children obtained the recommended allowance of protein than of any other nutrient; and the percentages of pupils having less than their allowance of protein varied from 27 per cent of the boys aged 13-15 years to 52 per cent of the girls aged 16-19 years. For all the other seven food elements considered, more than 60 per cent of pupils in one or more of the sex-age groups was supplied with less than the recommended allowance. For the group as a whole, the proportions of diets deficient in calcium, iron, and the vitamins varied from 53 per cent deficient in B_1 to 72 per cent deficient in calcium.

The frequency of insufficient amounts of a specific nutrient differed among boys and girls and for the two age groups. Thus, 80 per cent of girls in both age groups had less than the 15 mg. allowance of iron and this was the most prevalent deficiency; but among boys, about 50 per cent had less than the allowance, and iron was the least common deficiency except protein. For boys, the recom-

mended allowances for each of the four vitamins are higher for the older age group, but the intake by older boys of these vitamins was not proportionately higher, and the percentages of older boys deficient in the vitamins were higher than the percentages of younger boys. Deficiencies in vitamins were somewhat less frequent among girls than among boys; but insufficient amounts of calcium, iron, and protein were more frequent among younger girls than among boys.

An average daily intake of essential nutrients which is less than two-thirds of allowances is probably less than minimum requirements for most of these food elements. In Figure 1, it is shown that approximately 20 per cent of boys and girls in each age group had a diet which furnished less than two-thirds of their calorie need. A deficiency of more than one-third of the total allowance for vitamin A was found in 30 to 42 per cent of the diets of children in the four sex-age groups; for ascorbic acid, a deficiency of more than one-third was shown for 25 to 34 per cent of the diets; for calcium, the percentages ranged from 20 to 31 per cent. Iron in the diets of girls was more than one-third less than the allowance for 26 and 32 per cent of the younger and older girls, respectively, but this amount of iron deficiency was found for only 7 per cent of the boys. A deficiency of riboflavin of more than one-third of the allowance was found for 42 per cent of boys aged 16 to 19 years and for 16 to 18 per cent of younger boys and both age groups of girls. A similar deficiency of thiamin (B_1) was shown for 23 per cent of older boys, but for only 10 per cent or less of younger boys and of girls. The relative frequency of these deficiencies is summarized in Table 3 for each sex-age group by the rank order of the percentage in the group having less than two-thirds of the recommended allowance. Thus, the nutrient found to be deficient in the highest percentage of diets of boys aged 13-15 years is ranked 1, that in the second highest percentage of diets is ranked 2, and so forth.

On the basis of an intake of less than two-thirds of the allowance,

Nutrient	Boys 13–15 Yrs.	Boys 16–19 Yrs.	Girls 13–15 Yrs.	Girls 16–19 Yrs.
Vitamin A	1	1	1	1
Calcium	2	4	2	4
Ascorbic Acid	3	3	4	3
Calories	4	6	5	5
Riboflavin	5	2	6	6
Thiamin	6	5	7	7
Iron	7	7	3	2
Protein	8	8	8	8

Table 3. Rank order of frequency of deficiencies of more than one-third allowance.

vitamin A was the most common deficiency for all groups, and this deficiency, calcium, and ascorbic acid were three of the top-ranking four deficiencies for all groups.

Examinations on children in this Nutrition Study for the diagnosis of nutritional deficiencies have provided objective evidence that four of the dietary deficiencies shown above had produced recognizable mild deficiency conditions. The prevalence of avitaminosis A, ariboflavinosis, and of low hemoglobin values among about one-fourth of the total group have been published (5); and the prevalence of low plasma ascorbic acid levels for the total also has been reported (20). Changes in the conjunctiva associated with avitaminosis A were present in 88 per cent of 278 boys and 85 per cent of 216 girls; and 50 per cent of the boys and 48 per cent of the girls had marked thickening of the conjunctiva in one or both eyes, opacities or "spots." Invasion of the cornea by capillary "twigs" or "streamers," indicative of ariboflavinosis, was found for 76 per cent of the same groups of boys and of girls. Hemoglobin levels considered below "standard" and suggestive of iron deficiency were found for only 2.5 per cent of the 241 boys and 4.3 per cent of 184 girls. Plasma ascorbic acid levels below 0.6 mg. per cent, indicative of insufficient intake of ascorbic acid, were found for 48 per cent of 1,059 boys and 46 per cent of 1,088 girls. The high prevalence among girls of diets considered to be deficient in iron is not confirmed by their hemoglobin levels and it seems very question-

able that the allowance should be as high as 15 mg. daily. The high proportions of diets furnishing inadequate amounts of vitamin A, riboflavin, and ascorbic acid are confirmed by the medical findings.

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Record No. _____

1. Name of Head _____ Address _____

2. Name (s) of Pupil(s) in Seward Pk. (1) (2)

3. Ind. No.	4. Census of Household	5. Sex	6. Rel. to H.H.	7. Age	8. No. of Meals in 2 Days * Home a	Out b	9. Employment Occupation a	Priv. Other b	10. Wages Last Rec'd a	Usual b	Period c	11. Employment Wks. in Past 12 Mos.
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												

12. a. Sources of Other Income	b. Am't	c. Period	13. Annual Income (Est.)		14. Housing
Children's Aid-Widow's Pension			Under $750		No. of rooms Gas Elec.
Old Age Assistance			$750 – 999		Heating: Furnace Stoves
Home Relief			$1,000 – 1,249		No. of rooms heated
Priv. Ag. (*name*)			$1,250 – 1,499		Bath tub, Yes No
N.Y.A.			$1,500 – 1,999		Toilet: Private, Yes No
Relatives			$2,000 – 2,499		
Other			$2,500 or more		Amount paid for rent

FAMILY HISTORY. 15. a. Birthplace: Father _____ Mother _____

b. Father's Fa. _____ Mo. _____ Mother's Fa. _____ Mo. _____

c. National Origin: Fa. _____ Mo. _____

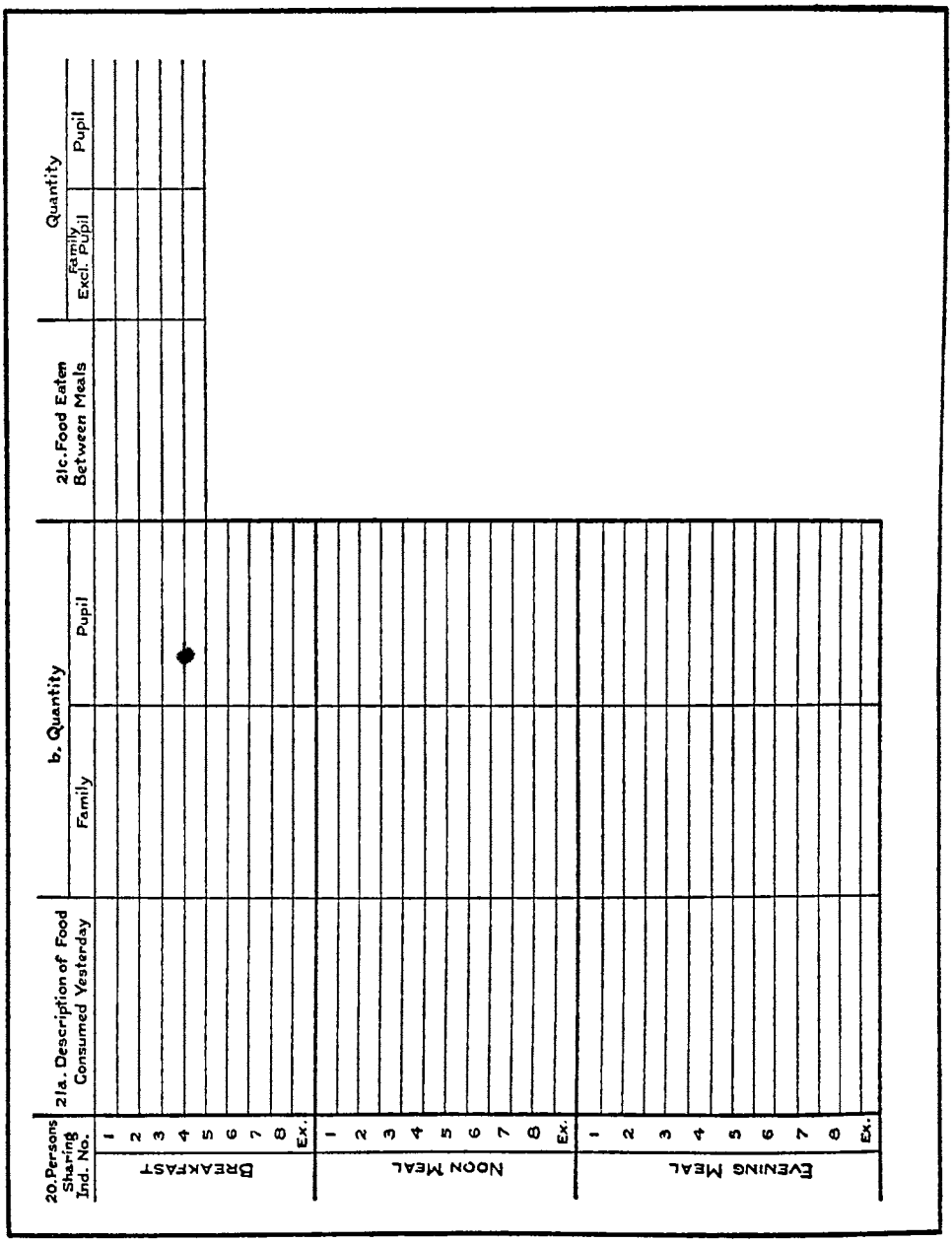
d. Year to U.S.: Fa. _____ Mo. _____ 16. Height: Fa. _____ Mo. _____

Member Dead or History of Disease	17. Deaths Year	Cause of Death	Age	18. History of Diseases – For Living and Dead Persons Tuberc.	Rheumatism	Heart Dis.	Diabetes	Cancer
Father								
Mother								
Child								
Child								
Child								

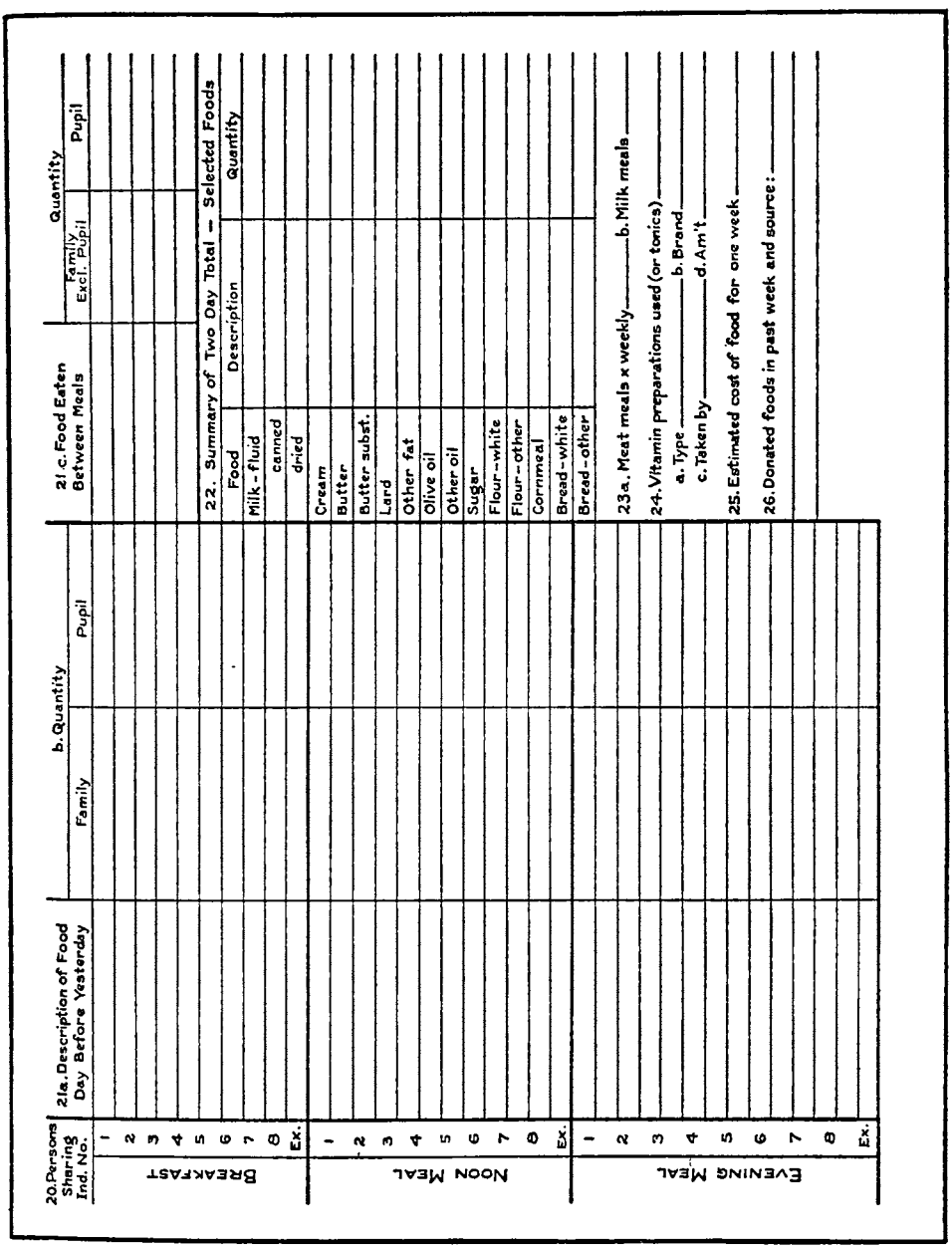
19. Family member (s) now ill or suffering chronic condition (specify) _____

Informant
Date
Visitor

APPENDIX I. Record form for data obtained in the home. The schedule provides for a disease history on the pupil and other family members, for income and environmental data, and for a two-day record of foods used by the family and estimates of amounts consumed by the pupil.


20. Persons Sharing Ind. No.
21a. Description of Food Consumed Yesterday
b. Quantity
Family
Pupil
21c. Food Eaten Between Meals
Quantity
Family Excl. Pupil
Pupil
Breakfast
Noon Meal
Evening Meal
1
2
3
4
5
6
7
8
Ex.

APPENDIX IA


20. Persons Sharing Ind. No.
21a. Description of Food Day Before Yesterday
b. Quantity
Family
Pupil
21 c. Food Eaten Between Meals
Quantity
Family Excl. Pupil
Pupil
BREAKFAST
NOON MEAL
EVENING MEAL
Ex.
22. Summary of Two Day Total — Selected Foods
Food
Description
Quantity
Milk - fluid
canned
dried
Cream
Butter
Butter subst.
Lard
Other fat
Olive oil
Other oil
Sugar
Flour - white
Flour - other
Cornmeal
Bread - white
Bread - other
23a. Meat meals x weekly
b. Milk meals
24. Vitamin preparations used (or tonics)
a. Type
b. Brand
c. Taken by
d. Am't
25. Estimated cost of food for one week
26. Donated foods in past week and source:

APPENDIX IB

27. DIET HABITS OF CHILD

Appetite: brkfast____ Eat alone____ With family____

Appetite for lunch____ Eats at home____ Hot L.____

Buys L. at Sch. Caf.____ Other____ App. Din.____

Eats between meals: daily____ Times weekly____

Food does not eat____

Foods not liked____

Foods liked especially____

Eats meats or fish x weekly____ Eggs____

No. of glasses of milk daily____ Of water____

Citrus fruits x weekly____ Other fresh fruits____

28. HEALTH HABITS

Time to bed____ Arises____ Hrs. sleep usual____

Sleeps in room with____ Bed to self____

Reads in bed____ Radio in sleeping r'm____

Movies: x weekly____ Afternoon____ Eve.____

Games or activities enjoyed____

Am't of exercise____

Fatigues easily____

29. HEALTH HISTORY OF CHILD

a. During past year

(1) Serious illness: Cause____ Month and Duration____ Days in bed____ Phys.____

(2) Serious illness: Cause____ Month and Duration____ Days in bed____ Phys.____

No. of colds____

Growth: Become taller____ More than usual____

Become more stout____ Thinner____ No change____

Weight: Any loss____ Increase____ No change____

b. Disease history (life) Give age of occurrence

Pneumonia____ Rheumatism____ Growing Pains____ Joint Pains____

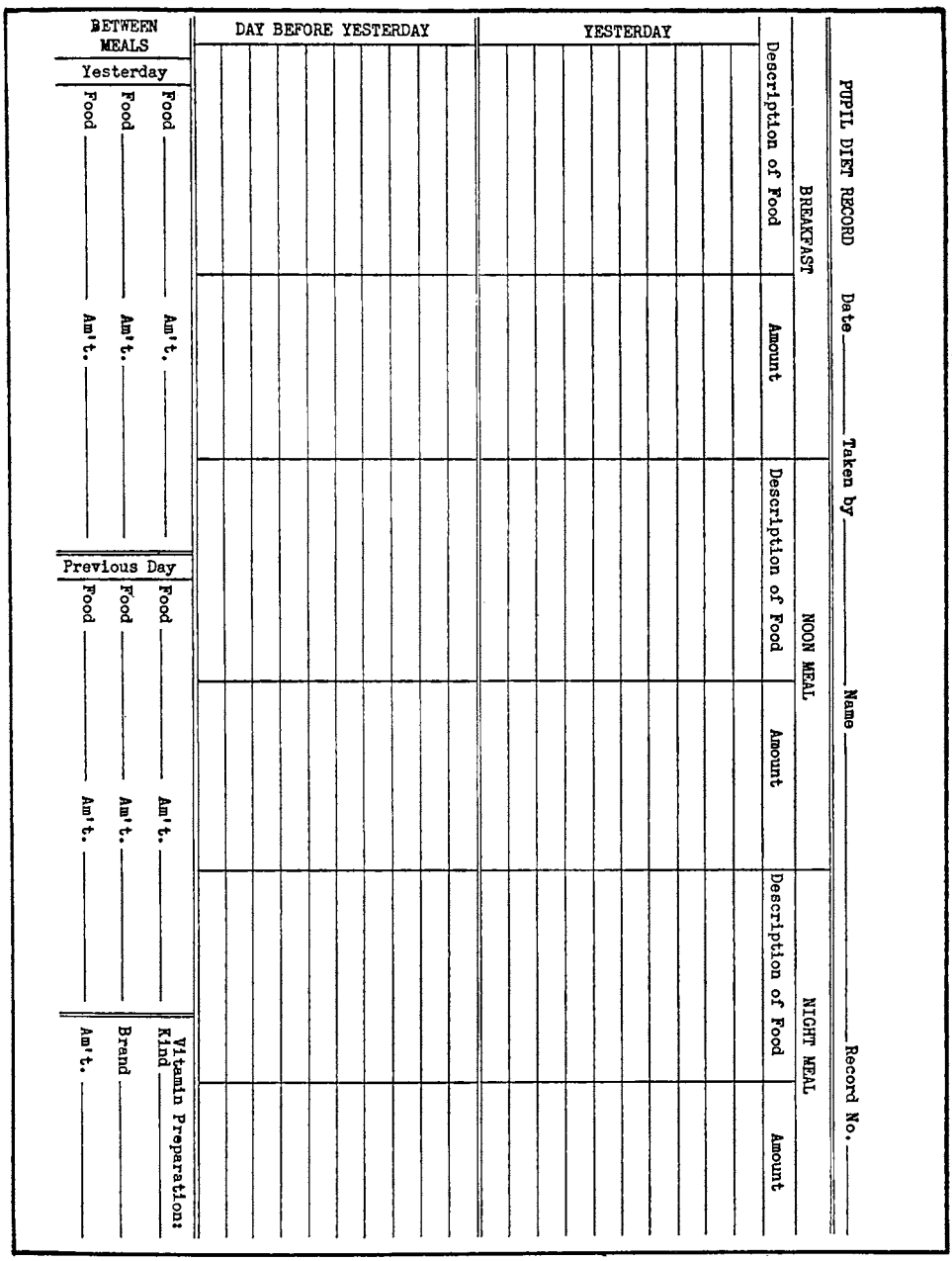
Scarlet Fev.____ Diphtheria____ Measles____

Whooping C.____ Tonsillitis____ Heart Dis.____

Prolonged or serious illness with or following any of above (explain)____

Other serious illness:____

APPENDIX IC



APPENDIX II. Record form for diet history from pupil interviewed at Study Clinic. It provides for a record of a pupil's food consumption for a two-day period.

-2-

FOOD HABITS

Yesterday's lunch: Eaten at home____ Carried___ B'ght.____ At school____ Free____

Previous day's " : Eaten at home____ Carried___ B'ght.____ At school____ Free____

Do you usually eat about the same breakfast?_____

If not, explain_____

Do you usually eat about the same amount of food, as in the past 2 days?_____

_____

Do you drink milk?_____ No. of glasses per week_____ Eggs per week_____

Kinds of fresh fruit eaten in past 7 days:_____

_____

Vegetables in past 7 days:_____

_____

Vitamin preparation: Kind_____ Brand_____ Am't._____

ACTIVITIES

Hour arose this A.M.____ Yesterday____ Hr. to bed last night____ Previous____

School exercise periods: Yest._____ Prev._____

Outdoors: Yest._____ Prev._____

Work or chores: Yest._____ Prev._____

Reading or studying: Yest._____ Prev._____

Indoors: Movie, etc. Yest._____ Prev._____

Other:_____

USUAL ACTIVITIES

School clubs_____

Other clubs_____

Athletics_____

Dancing_____

Movies_____

Other_____

APPENDIX IIA