A SURVEY OF THE DIETS OF CHILDREN IN FOUR ELEMENTARY SCHOOLS IN MILWAUKEE WITH IMPLICATIONS FOR AN EDUCATIONAL PROGRAM IN HEALTH EDUCATION OR NUTRITION

A Problem

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Master of Arts

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by

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

School administrators, teachers, public health officials and governmental authorities are becoming increasingly aware of the importance of incorporating nutrition education in elementary and secondary curriculums. Specific influences have helped stimulate and shape developments. As a result of high rejection rate from military service during World War II, great emphasis has been focused upon nutrition. In a nation of seemingly sufficient food supply, complacency is not uncommon and poor food habits are leaving imprints which cannot be ignored. Throughout the world, evidence accumulating in nutrition laboratories indicates that good nutrition is the essence of life and essential for maintenance of a healthy, progressive people. If a healthy population is to be maintained, it is imperative to begin nutrition education very early in child life. In this way, the family, and ultimately the community, can be reached and influenced to believe and act.

I. THE PROBLEM

Statement of the problem. It was the purpose of this study (1) to determine if there were unmet pupil

nutritional needs in the area chosen for study as revealed in food survey and physical examinations. If so, what contributions can the school provide to meet these needs; (2) to discover if there is a direct relationship between the nutritional status in high and low socio-economic groups; and (3) to show improved nutritional status of children through acceptance of the school lunch program.

Importance of the study. Part of today's interest in proving and expanding school health programs stems from changing emphasis of education. Yesterday, the sole purpose of education was to impart knowledge. Today, the concept is that the whole child comes to school, thus health acquires major importance.

If health is the first educational objective, nutrition should stand first among instructional subjects.

> "The need for better nutrition has been established by studies of many types, and is emphasized by the fact that poor food habits exist in varying, but sometimes large, proportions among all races and groups throughout the world. This is true even of areas in which the standard of living is high and essential foods are readily available."[1]

As Dr. Stare states, there is urgent need for improvement in food behavior among all races and socio-economic groups.

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[1] F. J. Stare, Nutrition Education in Elementary and Secondary Schools (Boston: Department of Nutrition, Harvard University School of Public Health, 1952), p. 3.

If improvement is to be made, certain basic information must be obtained; therefore, the purpose of this survey has been to secure data relating to pupil food habits and nutritional status in four Milwaukee elementary schools.

The writer's intimate knowledge and observation of poor food habits among pupils in school lunchrooms, plus added reports of teachers and principals that increasing numbers of pupils were coming to school without breakfast, or having had a scanty breakfast enroute -- often a bag of potato chips or a few bakery cakes -- confirmed the desire to investigate this problem further. First indications proved nutritional needs most alarming. Thus the objective has been to locate needs and plot improvement procedures from collected data.

II. DEFINITIONS OF TERMS USED

Obviously, a first essential in discussion of methods effecting better nutrition necessitates a clarification of terms, their use and significance as employed by specialists in the field.

Nutrition. According to Stare, "Nutrition deals with food nutrients (amino-acids, vitamins, minerals, carbohydrates and fats) and the way in which the body makes

use of these nutrients."[2]

Roberts states, "Nutrition involves the food supply itself, and all the chain processes through which the food goes to be utilized by the body, whether built into its structure or used as a source of energy for its activities."[3]

For the purpose of this study, "nutrition" shall be hereafter interpreted to include all the processes concerned in supplying food needs and the processes of utilization.

Good nutrition. Then, "good nutrition," of necessity, must imply that everything in this chain of processes is running smoothly. All body needs are being met by proper food intake, the various organs are doing their part in making it available to their use and the body thus nourished creates visible signs of well-being.[4] Thus, "good nutrition" shall be interpreted to mean that all food needs are adequate and proper utilization is taking place.

Malnutrition. Conversely, the term "malnutrition" shall be used to mean either the food intake is inadequate in some respect to meet body needs, or conditions are such

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[2] Ibid., p. 2.

[3] Lydia J. Roberts, Nutrition Work with Children (Chicago: The University of Chicago Press, 1935), p. 22.

[4] Loc. cit.

that the body is unable to utilize foods to maintain proper growth.

Nutrition education. All learning experiences directed toward the development of health knowledges, attitudes and practices with relation to food shall be referred to as "nutrition education."

Dietary surveys. Throughout this study much emphasis shall be given to the survey method as a means of uncovering food consumption. As defined by Good, Barr and Scates,[5] the word "survey" is used to indicate the gathering of data. It is concerned with ascertaining the conditions which prevail in a group of cases chosen for study, and is essentially a method of quantitative description of general characteristics of the group. The survey method shall be used in this study as a means of uncovering data concerned with food consumption.

Percentile groups. For the purpose of this study, pupil height-weight measurement values have been assigned to rating categories which shall be referred to as "percentile groups." Percentile groups are expressed in terms of 100

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[5] Carter V. Good, A. S. Barr, Douglas E. Scates, The Methodology of Educational Research (New York: Appleton-Century-Crofts, Inc., 1941), pp. 286-289.

units. It may be interpreted as a description of a child's position in a typical height-weight-age group in terms of either the percentages of pupils who fall below the median score of 50, or the percentages who exceed that score.[6]

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[6] C. C. Ross, Measurement in Today's Schools (New York: Prentice-Hall, Inc., 1947), p. 299.

CHAPTER II

REVIEW OF THE LITERATURE

A remarkable amount of basic research has given new light to nutrition problems. Recent studies in child growth and development are extending into other aspects of growth as related to nationality and socio-economic status. Schools are making marked advances in health work. Serious attempts are being made to include it in the curriculum on a sound basis.

Research has revealed that the school lunch program has made valuable contributions to health and physical well-being. Therefore, literature, useful in or related to a survey of food habits and nutritional needs of children, will logically include: (1) studies relating to food habits and nutritional needs; (2) studies investigating results of enriched nutrition education; (3) studies relating to improved nutritional status through acceptance of the school lunch; and (4) additional studies which make a contribution for educator use.

Historical background. Results of dietary surveys and nutritional appraisals have been reported at irregular intervals in widely scattered journals. In 1943, under auspices of the National Research Council, committee members

attempted to bring together recalculated and reclassified data from outstanding diet studies of the previous decade. Findings were summarized as follows:

> "All evidence from numerous surveys over the past ten years to the present among persons of all ages and in many localities is without exception in complete agreement that inadequate diets are widespread in the nation. An appreciable percentage of the diets failed to meet the Council's recommended dietary allowances. Accordingly, there is widespread prevalence of moderately deficient diets."[1]

From 1944 through 1948, outstanding studies were conducted by local communities, aided by nutrition and education staffs of General Mills, Incorporated,[2] Wheat Flour Institute[3] and Cereal Institute.[4]

The program for the enrichment of white flour in the United States was launched officially at the National Nutrition Conference for Defense called by the President in May, 1941. Some opposition developed on the ground that the program was unnecessary in our well-fed country,

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[1] Inadequate Diets and Nutritional Deficiencies in the United States (Washington, D. C.: National Research Council, 1943), p. 46.

[2] A Report of the Eating Habits of 59,727 Children (Minneapolis: General Mills, April, 1951).

[3] Russel M. Wilder, Recent Nutrition Surveys in Newfoundland (Chicago: Wheat Flour Institute, 1949).

[4] Elmo Roper, A Study of the Teaching of Nutrition in Public Schools (Chicago: Cereal Institute, Inc., March, 1951).

but facts do not substantiate this. In Newfoundland, a controlled demonstration of the value of flour enrichment and margarine fortification indicated nutritional improvement. Findings did not mean to imply the enrichment program had solved nutrition problems in New foundland or anywhere, but as a first step it was extremely beneficial.[5]

A similar study was conducted in three United States communities, with aid from the Department of Nutrition, Harvard School of Public Health, under a grant-in-aid from the Nutrition Foundation, Incorporated. Demonstration communities were at Newton, Massachusetts; Rutherford County, Tennessee; and Ascension Parish, Louisiana. In the latter, the program was motivated by children's dietary needs as determined from individual food records, which revealed that only 1.6 per cent had "good" food habits, 59.5, "fair," and 38.9, "poor."[6] In all studies, the following was shown:

1. Children's food habits were often poor.
2. Children's food habits in early elementary grades were superior to those in later elementary grades.

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5 Wilder, op. cit., pp. 4-11.

6 Floy E. Whitehead, "Dietary Studies in Ascension Parish, Louisiana," American Journal of Public Health, 42:1547-51, December, 1952.

3. Survey results were influenced considerably by the school lunch.
4. Time and effort were needed to change food habits.

Results of the Harvard-sponsored study parallel a similar survey conducted by the Wisconsin State Board of Health in 1948. Surveyed food habits of 4,000 elementary school children revealed 31 per cent had "good," 29 per cent "fair," and 40 per cent "poor" food habits.[7]

Literature concerned with food habits and nutritional status of children. Clayton[8] studied food habits and nutritional status of grade school children in three Maine towns. Physical measurements included height-weight, chest, girth of arm, thigh and subcutaneous fat indices. Surveys gave evidence of the following:

1. Bone defects resulting from rickets in infancy.
2. Malocclusion and dental caries.
3. Inflamed gums and other evidence of Vitamin C deficiency.

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[7] Maxine Armstrong and Dorothy Johnson, "Nutrition Joins the Three R's," Nutrition, Quarterly Bulletin of the Wisconsin Board of Health, October-December, 1953, p. 20.

[8] M. M. Clayton, The Food Habits and Physical Condition of Children in Selected Communities in Maine (Orono, Maine: The Maine Agricultural Experiment Station, Bulletin 401, 1940).

4. Anemia.

5. Underweight.

It was also found that the children's diets were low in milk, fruit, cooked and raw vegetables. The survey indicated frequency of some differences of certain nutritional defects in children of different localities. This was anticipated because of differences in agriculture, socio-economic status, transportation facilities and climate of state represented.[9]

Since food preferences are fundamental in nutritional status, Leverton and Coggs[10] secured data to determine food likes and dislikes of boys and girls living in Nebraska. Included in the study were 1267 girls, 745 of whom were from farms, 522 from towns; and 615 boys, 525 of whom were from farms and 90 from towns. Average and median age of these was 13½ years. Answers were supplied by checking food-preference questionnaires. Foods in a list of 45 which children checked as "unwilling to eat" were cooked cabbage, raw cabbage, green peppers, spinach, rutabaga, liver and milk. The study revealed that more farm children than town children "have never tasted" many of the foods listed.

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[9] Ibid., p. 81.

[10] Ruth M. Leverton and Maude C. Coggs, "Food Choices of Nebraska Children," Journal of Home Economics, 43:176-79, March, 1951.

Girls were more "willing to eat" a variety of foods than boys were. Results indicated many children were "unwilling to eat" foods rich in necessary nutrients. Indications were that if children selected food by preference alone, danger of serious nutritional deficiencies would result.[11]

In a study by Hendrikson[12] of children's dietary habits, it was found that almost three-fourths did not receive the required amount of milk (based on standards of the National Research Council's Food and Nutrition Board) of three or more cups a day. One-half did not receive adequate amounts of vegetables, other than potatoes. Two-thirds did not receive adequate amounts of citrus fruits and tomatoes. Three-fourths did not receive adequate amounts of other fruits, aside from citrus fruits and vegetables.[13]

Literature concerned with nutrition education. More and more educators and lay citizens are coming to believe that responsibility for seeking solutions to current health

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[11] Ibid., p. 178.

[12] Mary H. Hendrikson, "A Survey of the Dietary Habits of a Group of Elementary School Children with Special Emphasis on the Need for a School Lunch Program," (unpublished Master's thesis, The University of Nebraska, Lincoln, 1941), pp. 34-45.

[13] Ibid., p. 43.

problems rests, to a great extent, upon the public schools. Nutrition education is considered one of our major areas of responsibility today. Part of today's widespread interest in improving and expanding school health and nutrition education stems from changing views and purposes. The subject of health has emerged from its traditional concept of teaching physiology to an increasing recognition of health development and improvement of the whole child.

With it came the demand for teaching nutrition as adequately as other school subjects, if children were to develop better nutritional practices.

Bosley discussed the methodology and function of health education in the following manner:

> "Words are not the tools for teaching nutrition. They are merely the tools by which nutrition experiences can be expressed. Experiences are essential to true knowledge. Learning takes place when suitable experiences and appropriate tools are combined. If teaching nutrition is not planned and graded as other subjects are graded, if nutrition is not related to everyday living, then there is little reason to expect effective results from nutrition education."[14]

When Fletcher and Schuck[15] analyzed children's food

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[14] Bertlyn Bosley, "A Practical Approach to Nutrition Education for Children," Journal of American Dietetic Association, Vol. XXIII, No. 4, April, 1947, p. 309.

[15] Mary Fletcher and Cecilia Schuck, "Dietary Practices and Nutritional Status of Two Groups of Virginia School Children," Journal of Home Economics, 42:732-35, November, 1950.

habits and nutritional status in fifth, sixth and seventh grades of two Virginia schools, they found experimental groups consuming less than two-thirds of the recommended number of essential food servings. Meat was the only food of which more than the recommended servings was consumed. Following introduction of a nutrition education program for teachers, parents, and children, results of surveys made six months later showed improvement. Diet ratings of children showed a 6 per cent increase in "good" diets. A greater consumption of citrus fruits and eggs was also shown. Weight records did not indicate appreciable change because of time limits placed on the study.

Clayton,[16] in a continuation of a nutritional survey discussed earlier in this paper, reports on a four year study at Newport, Maine. As in the first study, height-weight and dietary data was obtained, but an additional factor was added to the second experiment to determine effect of health education. In the earlier study, findings indicate that health problems of Maine's grade school children are closely related to nutrition. Physical examinations of approximately 220 Newport children, made over

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[16] M. M. Clayton, A Four Year Study of the Food Habits and Physical Condition of Grade School Children in Newport, Maine (Orono: The Maine Agricultural Experiment Station, Bulletin 430, 1944).

a four year period, fall and spring, showed the following:

1. Bone defects common.
2. Underweight to extent of 6% in 1/3 of the children.
3. Dietary deficiencies in milk and Vitamin D indicated.
4. Diets low in citrus fruits, tomatoes, green and yellow vegetables and eggs.
5. Malnutrition less than during the first year survey.[17]

The most plausible explanation for malnutrition decrease during the last three years of the study appears to be the result of enriched nutrition education.

Literature concerned with the contribution of the school lunch in the educational program. It seems generally agreed that the major objective of the school lunch program is to improve school children's nutritional status. Studies have shownthat nutrition may be improved when the school lunch is planned to compensate for deficiencies detected in the home diets, or for deficiencies indicated by physical examination.

To determine relationship between children's physical

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[17] Ibid., p. 186.

well-being with and without a school lunch, a study was made by Moser[18] in two South Carolina rural elementary schools. The period of observation covered approximately one and one-third years. Results are summarized briefly:

1. A higher proportion of the complete lunch group made gains in height than of the partial lunch group.
2. Greater outward signs of good nutrition among the complete lunch group.
3. Thirty-eight per cent showed an improved growth record.
4. Hemoglobin levels were maintained in spite of increased demand for blood-building materials during growth.
5. The school lunch, while it alone cannot correct long-standing malnutrition, can play an important role.

Data from the Moser study serves to verify the important role of the school lunch in improvement of children's food intake. More vitally important, however, is the function it serves in improving food habits and teaching

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[18] Ada M. Moser, Nutritional Condition of Children in Relation to School Lunches (Clemson, South Carolina: The South Carolina Agricultural Experiment Station, Bulletin 359, 1945), pp. 15-17, 18-35.

adequate diet essentials, not only to school children, but to families from which they come.

Much has been written concerning the importance of school feeding to the well-being of boys and girls. The mere provision of a noon meal is only the first step. In many schools the educational aspects of the lunch program have not been envisioned. There are, however, some notable exceptions. The old concept of feeding "needy children" is rapidly changing as educators and parents recognize that all children are needy children when it is time to eat. More and more there is evidence of greater understanding of the full potentialities of the school lunch program in relation to child growth and development. This may best be effected when the lunchroom becomes an integral part of the school program and the lessons taught in the classroom can be reinforced and practiced in the lunchroom. Thus, enrichment of learning becomes an effective tool for helping children grow in wisdom and stature.[19]

In John W. Studebaker's discussion of effective use of the lunchroom as a laboratory for learning, we find this summation:

> "It is only an economical use of school resources to see that the educational potentialities

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[19] Growing Through School Lunch Experiences (Tallahassee: Florida State Department of Education, Bulletin 33A, 1948), p. 5.

of the school lunch are realized in every school."[20]

Conclusions on the review of literature. The survey method of determining children's nutritional status has been widely used during the past decade or more. Results, regardless of economic level, age, or locality, gave evidence that school children generally have poor food habits. The higher the grade level, the less adequate became the diet. Availability of products did not seem to insure a proper diet. The school lunch influenced results of surveys appreciably as well as enriched nutrition education in the classroom. Changing food habits involves time and effort. The dietary pattern showed a limited variety of vegetables and fruits and a limited number of servings of these protective foods.

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[20] Making School Lunches Educational (Washington, D. C.: Federal Security Agency, United States Office of Education, Pamphlet No. 2, 1944), p. 5.

CHAPTER III

PROCEDURE FOLLOWED

The material presented in this paper originates from data collected on a selected group of grade school children. The purposes of the study were threefold: first, to determine if there were unmet nutritional needs through study of food habits; second, to discover if a relationship exists between the nutritional status in high and low socio-economic groups; and third, to show improved nutritional status of children through acceptance of the school lunch program.

Selection of cases. The group studied included 1757 boys and girls from four Milwaukee elementary schools, grades one through eight. Pupil participation was on a voluntary basis. Factors considered in selection of participating schools were: (1) evidence of obvious malnutrition, (2) differences in socio-economic levels, and (3) provisions for school feeding program.

Description of samples. Statistics on basic population and housing characteristics for each school area studied have been obtained from the Seventeenth Decennial Census of April 1, 1950.[1]

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[1] United States Census of Population, Milwaukee, Wisconsin, Census Tracts (Washington, D. C.: Department of Commerce, Bureau of the Census, April 1, 1950), pp. 8-16, 23-56.

1. School A. Area residents are approximately one-fifth non-white. Four-fifths of the male and one-third of the female population are employed. Average annual income is $3,255 per family. Work classification of male and female members is mainly factory work or equal. Average educational attainment per person is 8.7 years. Homes are two-thirds renter occupied with median rental of $37.87. Total school population includes 696 children. School A is without lunchroom facilities.

2. School B. Area residents are white and approximately ninety per cent are native born. Approximately four-fifths of the male and one-third of the female population are employed. Employment classification of male members is one-third factory work or equal, one-third craftsmen, and one-third clerical or kindred work. Female workers are classified as one-third factory or equal, one-third clerical or kindred, and one-third household service workers. Average annual income is $3,310. Educational attainment per person is 8.7 years. Two-thirds of the homes are renter occupied with a median rental of $34.90. Homes which are owner occupied have an assessed valuation of $5,000 - $7,000. Total school population includes 562 children. School B has operated a well-managed school lunch program for a

number of years.

3. School C. All residents of Area C are white and native born. Seven-eighths of the male and one-fourth of the female population are employed. Work classification of male members is one-third professional, one-third craftsmen, and one-third managerial or official. Female employees are classified as one-third professional, one-third clerical, and one-third operatives or kindred. Average annual income is $4,285. Educational attainment is 10.3 years. Homes are two-thirds owner and one-third renter occupied. Median rental is $58.33. Assessed value of homes averages $13,466. Total school population includes 895 children. School C is without lunchroom facilities.

4. School D. All area residents are white and native born. Seven-eighth of male and one-third of female population are employed. Male workers are classified as one-third professional, one-third craftsmen, and one-third operatives or equal. Classification of female workers is one-fourth professional, one-fourth clerical, and one-half operatives or kindred. Average annual income is $3,929. Educational attainment is 10.6 years. Two-thirds of the families are home owners, with an average valuation of $11,224, and one-third are renters, paying median rental of $48.72. Total school enrollment is 585. School D does

not have a school lunch program.

5. School E. This group represents the experimental school. Area residents are approximately three-fourths non-white. Three-fourths of the male and one-third of the female population are employed. Employment classification for male members is one-third operatives or kindred, one-third service workers, and one-third laborers. Female work classification is one-third factory work or equal, one-third service workers, and one-third private household workers. Average annual income is $2,241. Educational attainment is 8 years. Homes are mainly renter occupied with a median rental of $30.65. Total school population includes 790 children. School E is without lunchroom facilities. This experimental group will be discussed more fully later in this paper.

Collection of data. In the fall and spring of 1953-1954, on request of the Milwaukee Public Schools, the City Health Department, with the assistance of teachers and parents, took height-weight measurements and made food habit surveys of children enrolled in the four schools chosen for study. Classes were taken to the nurse's room upon notice from the principal's office. Teachers accompanied classes and assisted with records. Trained parent volunteers, in some instances, measured and weighed children and gave results to teachers for tabulation. (See Appendix 1). Teachers

or parents were given the "Height-Weight Percentile Tables" prepared by Stuart and Meredith,[2] to use in assigning children's measurements to percentile groups. (See Appendix 2).

Medical members of the Milwaukee City Health Department, then selected those whose measurements fell in either the "very low" or the "very high" percentile groups,* and gave them closer physical inspection and appraisal, according to standards established by Stuart and Meredith.[3]

So that dietary information might be secured, classroom teachers instructed all children about keeping food records for three days -- Sunday, Monday and Tuesday, on specially prepared record forms. (See Appendix 1). At the end of three days, or more specifically, on the Wednesday following the recording of Tuesday's evening meal, record sheets were forwarded to the City Health Department for scoring. Volunteers, trained by the Milwaukee Health Department Nutritionist, scored records and recorded results on special forms adapted from General Mills, Incorporated, Minneapolis, Minnesota. (See Appendix 3).

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[2] Harold D. Stuart and Howard V. Meredith, "Use of Body Measurements in the School Health Program," American Journal of Public Health, Vol. 36, No. 12, December, 1946, pp. 1365-86.

* "Very low" meaning below standard weight or height; "very high" meaning above standard weight or height.

[3] Ibid., Vol. 37, No. 11, November, 1947, pp. 1435-38.

Summaries of the foregoing surveys were interpreted to teachers by the Nutritionist and City Health Department Specialists, after which evaluation reports were sent on to parents. (See Appendix 4). Appearances of doctors, nutritionists, and school lunch personnel before parent groups provided a broader phase of community education than was heretofore attempted.

In order that the exact situation in the case of School E, the experimental school, be clearly understood, the writer desires to continue below with a more detailed discussion of School E.

School E, or Experimental Group. The number of children included in School E, the experimental group, was about 100. These were selected because nutritional appraisal and physical inspection indicated that their measurements fell in either the "very low" or "very high" percentile groups.

On the Monday following medical recommendations by the City Health Department for added nutrition for the 100 children, noon lunches were begun for the group by the Milwaukee Public Schools. Since it is not within the scope of the school to regulate child diets during out-of-school hours, findings will be based only upon results brought about through pupil participation in the noonday lunch program as provided in the school. The only way in which the

school can hope to effect better food habits during out-of-school hours is through nutrition education offered children as a part of the regular curriculum. It is the feeling of this writer that the school lunch program represents more than a supplement to the regular diet. It may be used as a means of teaching good food habits, acceptable table manners, and better social patterns, not only by precept, but actually by example. It is hoped that what is thus learned and practiced through school lunch experiences will carry over into the home. Lunchroom facilities were not available in School E, therefore, provisions were made to accommodate pupils at an adjacent high school.

Parental consent was necessary before the children could participate in the lunch program. A fee of fifteen cents was charged for each lunch, with free lunches provided for children whose parents were financially limited. The type A lunch, as defined under the federal standards, was served each child. Requirements state that the lunch must contain the following:

½ pint whole milk

3/4 cup cooked or raw fruit and/or vegetable

1 or more slices of whole grain or enriched or cereal bread

2 oz. serving of meat, fish, cheese, or peanut butter or egg or dried beans and/or peas

2 teaspoons butter or fortified margarine.

An intensive instructional program in nutrition was included during the 1953-54 school year for the 100 boys and girls who were selected for the project. Suggestions from the Curriculum Department of the Milwaukee Public Schools were followed in coordinating the nutrition program with other areas of education. Many possibilities for integrating nutrition with health, science, social studies, language, mathematics, art, and music were suggested by teachers, supervisors, and lunchroom personnel. Bulletin boards, chalk boards, experiments, and other exhibits and projects offered ample physical evidence of the emphasis being placed on nutrition education throughout the building. In the classroom children discussed home and school lunch menus, placing emphasis on a balanced diet. In this connection they wrote stories and plays about foods, sent letters to health departments for opinions on good eating habits, conducted animal feeding experiments, planned breakfast projects with mothers as guests -- including a trip to local grocery for food purchases -- edited a weekly nutrition paper, and conducted numerous other activities to make programs more effective. (See Appendix 5).

In order to increase the value of the project described above, plans were made with the City Health Department and the Milwaukee Public School Lunch Department for a second physical inspection of the experimental group,

following group participation in the school lunch program and after special classroom nutrition education was provided. Results will be described in appropriate sections of this report.

Sources of information used in the study. The instruments used in gathering data for food habit surveys were designed in part by the Milwaukee City Health Department, Milwaukee Public School Lunch Department, and teachers, patterned from materials prepared by General Mills, Incorporated.

Other valuable information was obtained through personal interview with principals, teachers, home economists, Curriculum Director and Health Coordinator of the Milwaukee Public Schools. In addition to the above, personal interviews with City Health Department personnel, school nurse, parents, and neighborhood food purveyors provided all sources of information for the study.

Data utilized in survey. The data utilized in the survey of food habits took into account numbers of essential food servings included in each meal for three days. The Score Sheet includes nine food groups instead of the familiar Basic Seven. It seemed that more valuable information would be obtained if potatoes and eggs were checked separately from "other vegetables" and from "meat," with which they are

classified in the Basic Seven pattern. The standard number of servings for each food group is given in the list which follows. These standards are based on the Recommended Dietary Allowances for specific nutrients recommended by the National Research Council.[4]

STANDARD NUMBER OF SERVINGS FOR EACH GROUP

Food Groups	Recommended Servings
Milk	4 per day (children)
Eggs	4 per week
Citrus fruits	1 per day
Non-citrus fruits	1 per day
Meat (lean only)	1 per day
Whole grain cereals and bread (enriched)	2 per day
Butter or fortified margarine	2 per day
Potatoes	1 per day
Green or yellow vegetables	1 per day
Other vegetables	1 per day

In counting food in the different groups, the following suggestions for amounts were followed:

1. Plain fluid milk (only) -- average serving = 1 cup.
2. Eggs or egg custard -- average serving = 1 whole egg.
3. Citrus fruit -- average serving = 1 medium or ½ cup juice.
4. All kinds of non-citrus fruits -- average serving = 1

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[4] Eva G. Donelson and Jane M. Leichsenring, "Food Composition Table for Short Method of Dietary Analysis," Journal of American Dietetic Association, 18:429-39, 1942.

medium or ½ cup juice.

5. Meat, lean only -- average serving = 2 to 3 ounces.
6. Bread, flour and cereal -- average serving = 1 slice bread, ½ cup cooked cereal, 1 cup ready-to-eat.
7. Potatoes, white or sweet -- average serving = 1 medium or ½ cup cooked.
8. Butter or fortified margarine -- average serving = 1 teaspoon.
9. Green leafy or yellow vegetables -- average serving = 2/3 cup.
10. Other vegetables and fruits -- average serving = 2/3 cup.[5]

Procedure used in rating diets. Information secured from each child's three day food record was tabulated, scored and classified on specially prepared record sheets. (See Appendix 3). The method used was as follows: (1) number of servings, or portions thereof, was numerically tabulated from each of the nine food groups listed above. One point was given for each serving from each food group, the highest

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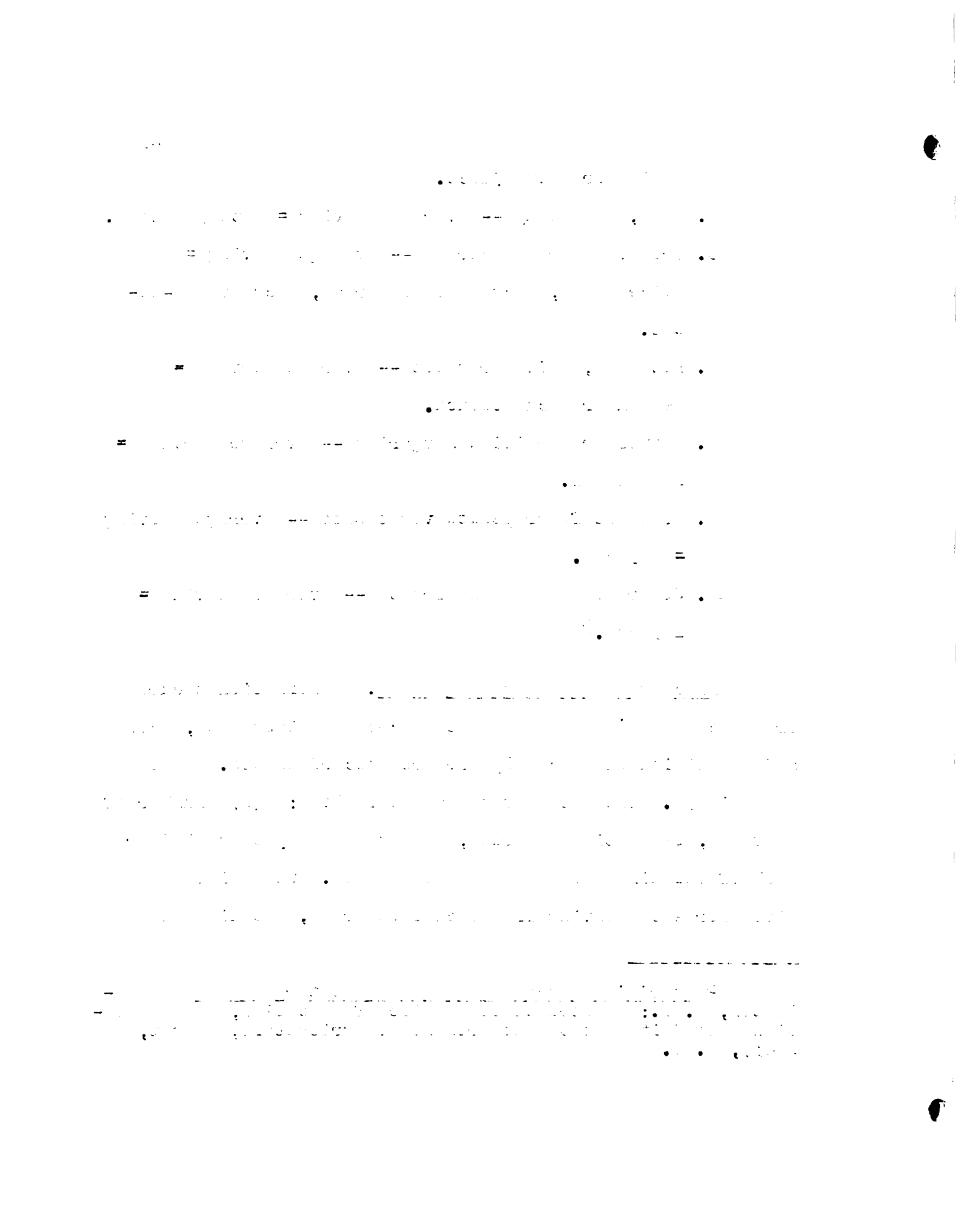
[5] Nutrition Education in the Elementary School (Washington, D. C.: United States Office of Education, in Cooperation with United States Department of Agriculture, August, 1943), p. 4.



possible score being "3" regardless of the number of servings, and the lowest "0"; (2) diets were rated "poor" if the total score was 18 or lower, or if no milk was included. This represents 60 per cent or less of the recommended allowances. Diets were rated "fair" if the total score was 19, 20, or 21, and the milk score was at least 1. This score represents 61 per cent to 80 per cent of the recommended allowances. Diets were rated "good" if the total score was 22 or higher and the milk score was 2 or 3. This represents 80 per cent or more of the recommended allowances. (See Appendix 3).

CHAPTER IV

THE FINDINGS

An analysis and interpretation of the findings of this study will consist of three major steps: Part A -- an examination of the dietary conditions in the four schools selected for the study; Part B -- an examination of the apparent nutritional adequacies and inadequacies as influenced by some contributing factors; and Part C -- an examination of the nutritional status of children through acceptance of the school feeding program.

Data are presented graphically as a means of emphasizing significant findings.

Part A -- An examination of dietary conditions. Of the 1757 children studied, only one-half, or 51.3 per cent had "good," 23.9 per cent "fair," and 24.8 per cent "poor" diets. Table I indicates that School A has the lowest per cent of "good" (26 per cent) and the highest per cent of "poor" (50 per cent) diets among schools surveyed. School C shows the highest per cent of "good" (60.4 per cent) and the lowest (16.3 per cent) of "poor" diets. Slightly more than one-half, or 56.8 per cent, of the diets for School D were "good" and 19.3, "poor."

TABLE I

PERCENTAGE COMPARISON OF DIETARY CLASSIFICATION GROUPS IN FOUR ELEMENTARY SCHOOLS

School	Pupils	Diet Ratings "Good" Diet	%	"Fair" Diet	%	"Poor" Diet	%
A	381	97	26	90	24	194	50
B	344	198	57.5	87	25.3	59	17.2
C	634	382	60.4	148	23.3	104	16.3
D	398	226	56.8	95	23.9	77	19.3
Totals	1757	903		420		434	
Average Per Cents			51.3		23.9		24.8

Table I further shows that extremes in dietary habits exist in School A. Here lies the lowest per cent of "good" and the highest per cent of "poor" diets. This factor, not evidenced in any of the other schools studied, presents an interesting problem which will be considered later. Conditions affecting nutritional status of children are apparently similar to those of School B. In the case of School B, it will be noted that it ranks high in "good" and low in "poor" diets. According to the data, School C presents the best dietary record of those studied.

Figure I shows a composite design for supplying more objective comparison than would otherwise be possible through review of data above.

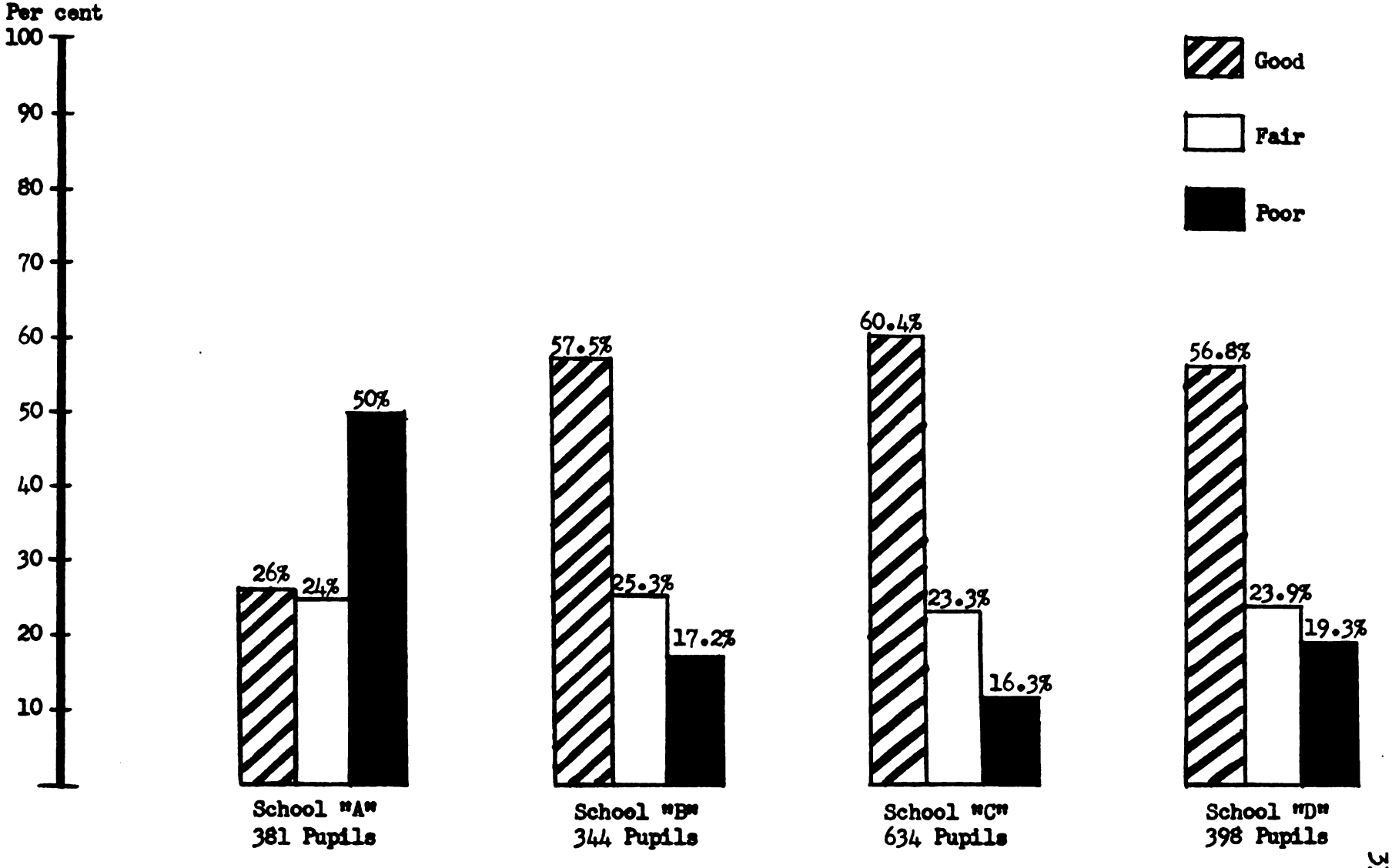


FIGURE I. CLASSIFICATION OF DIETS REPORTED BY PUPILS FROM SAMPLE SCHOOLS IN MILWAUKEE

For further study, Figure II reveals percentage comparisons of "good," "fair," and "poor" diet habits of the four elementary schools chosen for study, with results obtained from similar surveys in Wisconsin state and the nation.

Data collected by General Mills shows that 33 per cent of children surveyed (60,000) had "good" diets, 27 per cent "fair" and 40 per cent "poor." A similar survey conducted by the Wisconsin State Board of Health, involving 2,000 children, reveals that 31 per cent had "good" diets, 20 per cent "fair," and 40 per cent "poor." It should be noted that, in the case of School A, percentage of poor diets is much higher than found in national and Wisconsin state surveys. Schools B, C, and D present somewhat better food habit patterns than indicated in reports of Wisconsin state or the General Mills study. Figure II, on page 35, illustrates a comparison of the four schools with the General Mills and State of Wisconsin surveys.

Part B -- An examination of apparent relationship between nutritional status and socio-economic group. What factors, if any, contribute in part to the dietary practices of the groups studied? To answer this question, it seems desirable to rate the effects of several socio-economic elements, factors, or conditions. Table II, page 36, attempts to show relationship of status to food habits. Comparisons are made as to (1) race, (2) number of male and female persons employed, (3) median income per family, (4)

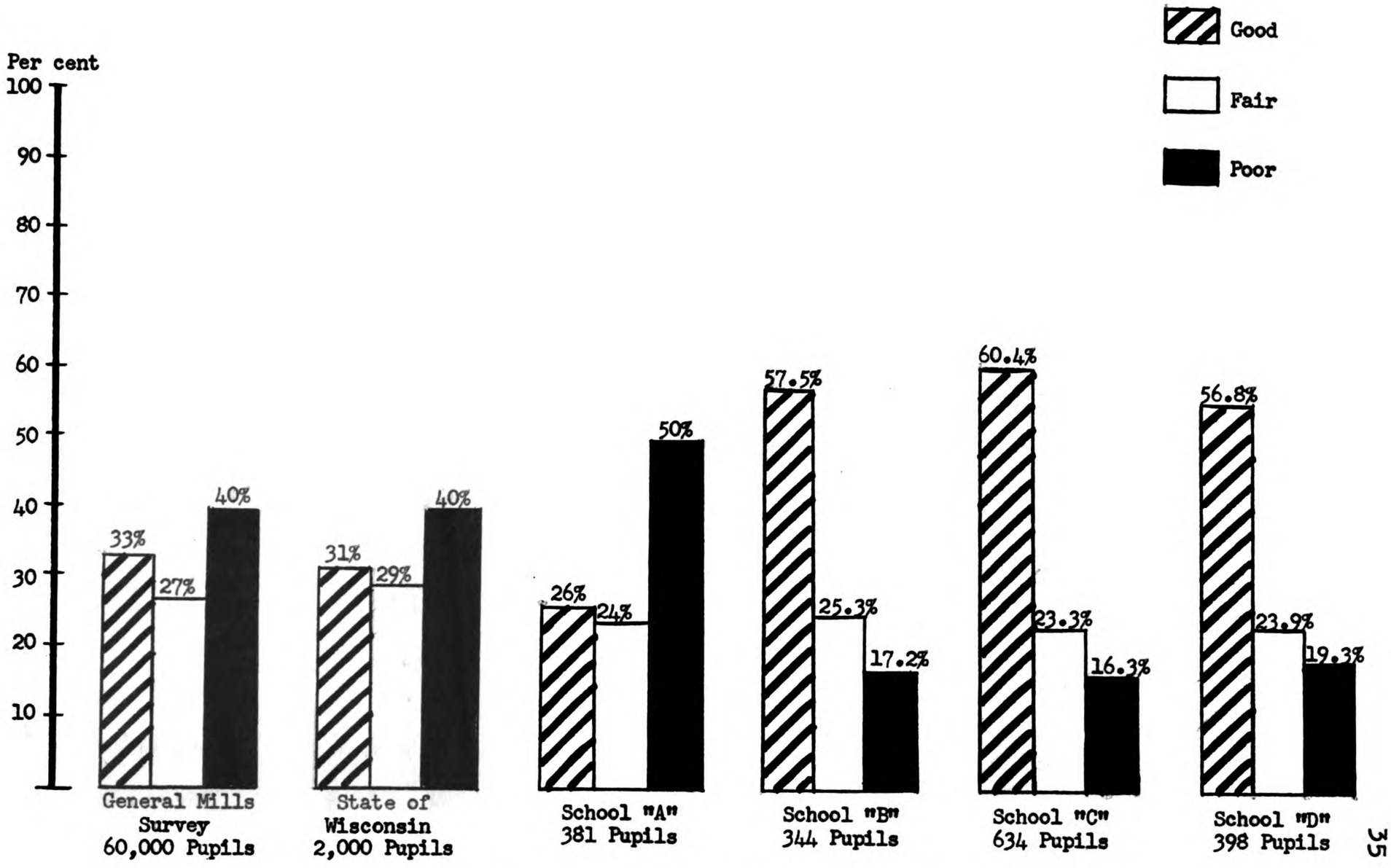


FIGURE II. COMPARISON OF DIET CLASSIFICATIONS REPORTED BY PUPILS FROM NATION, STATE OF WISCONSIN AND SAMPLE SCHOOLS IN MILWAUKEE

TABLE II

A COMPARISON OF ECONOMIC FACTORS AFFECTING SCHOOLS A, B, C, D, E*

School Area	Race		Workers Employed		Income per Family (Median)	School Years Completed (Median)	Work Classification		Dwellings			
	White	Non-White	Male	Female			Male	Female	Owner Occupied	Renter Occupied	Assessed Valuation	Monthly Rental
A	4/5	1/5	4/5	1/3	$3,255	8.7	Factory	Factory	1/3	2/3	$7,000	$37.87
B	8/9	1/9	4/5	1/3	3,310	8.7	1/3 Factory 1/3 Craftsman 1/3 Clerical or kindred	1/3 Factory 1/3 Clerical or kindred 1/3 Household service workers	1/3	2/3	5,000-7,000	34.90
C	All	-	7/8	1/4	4,285	10.3	1/3 Professional 1/3 Craftsman 1/3 Managers or officials	1/3 Professional 1/3 Clerical 1/3 Operative or kindred	2/3	1/3	13,466	58.33
D	All	-	7/8	1/3	3,929	10.6	1/3 Professional 1/3 Craftsman 1/3 Operatives or kindred	1/4 Professional 1/4 Clerical 1/2 Operatives or kindred	2/3	1/3	11,244	48.72
E	1/4	3/4	3/4	1/3	2,241	8.0	1/3 Operatives or kindred 1/3 Service workers 1/3 Laborers	1/3 Factory 1/3 Service workers 1/3 Private household	-	All	-	30.65

* Characteristics of the Population and Housing of Census Tracts from the 17th Decennial Census of the United States, as of April 1, 1950. Data based on 20 per cent sample.

median educational attainment, (5) work classification of both sexes, and (6) home environments.

With exception of race, Schools A and B are comparable in most aspects, as was pointed out on page 32. School areas C and D are relatively parallel in most categories and rank highest in socio-economic groups. In the case of School E, the experimental group, families are mainly non-white, the median family income is lowest of groups studied, the median educational attainment is slightly below that of other groups, home ownership is apparently non-existent, and families fall definitely in the low rent classification.

In order to present additional information concerning food habits of children in the four schools chosen for study, analyses of basic food group consumption will be presented in Tables III and IV.

An analysis of basic food group consumption for School A shows that only 30 per cent consumed green and yellow vegetables, 35 per cent citrus fruits, and 15 per cent other vegetables in adequate amounts. Only one-half of the children consumed adequate amounts of milk. The findings reveal that 89 per cent of the 381 pupils surveyed in School A received adequate amounts of meat, fish, and poultry. Less than one-third (31 per cent) consumed sufficient amounts of butter or fortified margarine.

Although School A represents a low socio-economic

TABLE III

CONSUMPTION OF THE BASIC FOOD GROUPS
(SCHOOL A -- DATA ON 381 CHILDREN)

	Pupils - School A					
Food Group	No Servings	Per cent of Total	Total Adequate Servings	Per cent of Total	Total Inadequate Servings	Per cent of Total
Green and Yellow Vegetables	71	19	116	30	194	51
Citrus Fruits	98	26	133	35	150	39
Potatoes	69	18	154	40	158	42
Other Fruits and Vegetables	126	33	54	15	201	52
Milk and Milk Products	22	6	189	50	170	44
Meat, Fish and Poultry	5	1	338	89	38	10
Eggs	26	6	235	63	120	31
Breads and Cereals	0	0	292	72	89	28
Butter or Fortified Margarine	67	18	115	31	199	51

group, it is rather unusual to observe the high consumption of protein foods among this group, inasmuch as they are considered relatively expensive foods. There may be several factors involved here. It may indicate questionable buying practices, that is to say, that the limited financial resources of these families are being depleted in purchases of relatively expensive foods to the exclusion of others. Also involved may be the lack of parental understanding of the elements of good nutrition, insufficient parent nutrition education, or parental indulgence of child food whims.

It is probable that a substantial meat diet is necessary for parents to sustain vitality, consequently children's diets likewise fall into the same pattern. Upon examination of Table II, page 36, parent occupations tend, for the most part, to fall into the category of factory or equally hard labor. Inasmuch as School A is without a lunch program, no opportunity is provided to supplement home diets. The need for an active program of nutrition education for both parents and children is definitely indicated here.

TABLE IV

CONSUMPTION OF THE BASIC FOOD GROUPS
(SCHOOL B -- DATA ON 344 CHILDREN)

	Pupils - School B					
Food Group	No Servings	Per cent of Total	Total Adequate Servings	Per cent of Total	Total Inadequate Servings	Per cent of Total
Green and Yellow Vegetables	37	11	174	51	133	38
Citrus Fruits	20	6	192	56	132	38
Potatoes	2	1	262	76	80	23
Other Fruits and Vegetables	70	20	85	25	189	55
Milk and Milk Products	6	2	257	75	81	23
Meat, Fish and Poultry	0	0	338	98	6	2
Eggs	15	4	255	74	74	22
Bread and Cereals	2	1	261	76	81	23
Butter or Fortified Margarine	34	10	155	45	155	45

In reviewing the consumption of basic food groups for School B, Table IV shows 51 per cent of the children had sufficient amounts of green and leafy vegetables, and 56 per cent had adequate amounts of citrus fruits. However, only 25 per cent had enough of the other fruits and vegetables. The weak link here is obvious. Less than one-half (45 per cent) included adequate amounts of butter in diets. School B represents a low socio-economic group. Yet, in both situations, relatively expensive food groups were consumed, although School B had school lunch facilities while School A did not. The only variable indicated here is the category of parent occupations.

Analyzing diets of School C in terms of basic food groups, Table V indicates that 36 per cent of the children had adequate amounts of green and yellow vegetables, while only 28 per cent had sufficient servings of other fruits and vegetables. Satisfactory consumption of other food groups seems apparent. School C represents a middle socio-economic class, and thus it might be understandable that expensive food groups would be consumed. Fruits and vegetables are peculiarly absent from the diets in sufficient quantity.

Here the question "why" resolves itself. Since parent occupations fall in professional, clerical, and operative or kindred categories, the assumption that either

TABLE V

CONSUMPTION OF THE BASIC FOOD GROUPS
(SCHOOL C -- DATA ON 634 CHILDREN)

Food Group	Pupils - School C					
	No Servings	Per cent of Total	Total Adequate Servings	Per cent of Total	Total Inadequate Servings	Per cent of Total
Green and Yellow Vegetables	93	15	227	36	314	49
Citrus Fruits	27	4	444	70	163	26
Potatoes	31	5	372	59	231	36
Other Fruits and Vegetables	78	12	175	28	381	60
Milk and Milk Products	1	0	552	87	81	13
Meat, Fish and Poultry	1	0	612	97	21	3
Eggs	31	5	406	64	197	31
Bread and Cereals	0	0	447	71	187	29
Butter or Fortified Margarine	14	2	429	68	191	30

misunderstanding or lack of knowledge of dietary needs cannot be justified. It would seem that two factors might be involved here; first, that it may again be a case of parental indulgence in the matter of child diets, or second, that children's weekly allowances may be such as to permit between meal snacks of candy, coke, potato chips or other food supplements, resulting in less desire for more necessary foods. It is highly probable that concentrated and continued pupil, as well as community, nutrition education is needed, in

addition to the values that might accrue from a school lunch program.

Table VI illustrates the consumption of basic food groups in the case of School D, with 32 per cent of the children having satisfactory servings of green and yellow vegetables, but only 31 per cent having adequate portions of other fruits and vegetables. Families in School Area D represent a middle socio-economic group, and since it is relatively comparable to School C, similar deductions may be made for School D. Table II, page 36, points to similar influential factors which may have contributed to the present nutrial status of children in the sample.

TABLE VI

CONSUMPTION OF THE BASIC FOOD GROUPS
(SCHOOL D -- DATA ON 398 CHILDREN)

	Pupils - School D					
Food Group	No Servings	Per cent of Total	Total Adequate Servings	Per cent of Total	Total Inadequate Servings	Per cent of Total
Green and Yellow Vegetables	40	10	127	32	231	58
Citrus Fruits	37	9	259	65	102	26
Potatoes	12	3	240	60	146	37
Other Fruits and Vegetables	44	11	122	31	232	58
Milk and Milk Products	4	1	325	82	69	17
Meat, Fish and Poultry	0	0	390	98	8	2
Eggs	20	5	291	73	87	22
Bread and Cereals	3	1	276	69	119	30
Butter or Fortified Margarine	27	7	251	63	120	30

Part C -- A review of the findings from experimental group E. A brief review of the situation in School E, the experimental group, will help to inform the reader as to nutritional status of the participants. Nutritional and physical inspections were conducted similarly to those of other schools chosen for study, with the exception that children whose measurements fell in "very low" percentile groups were selected for noonday lunch participation. In addition, an intensive classroom nutrition instruction program was included during the 1953-1954 school year for the ninety-nine boys and girls who were selected for the project. (See Appendix 5).

Nutritional and physical appraisals were made in September, 1953, and physical appraisals repeated in May, 1954. (See Appendix 6). The number of participants fluctuated between the initial ninety-nine recommended for study downward to forty-nine. Since the children involved in the School E study are from families that are highly mobile, there may be some reason to believe that this constant shift from one neighborhood to another may account for some retardation in grade placement, incidence of unsatisfactory study habits, lack of a sense of "belonging," and an inability to settle down and adjust to group pattern. This unsettled residence characteristic may account for the fluctuation in noonday lunch participation. There are many factors that might be taken into account here; such as, the changing

market for salable skills, limited education, inadequate housing, out-of-reach rentals, large families, the sometimes broken homes, and working mothers.

In the case of School E, the experimental group, it was found from food habit surveys that of the ninety-nine children chosen for study only 5 per cent had even a "fair" diet, and the remainder was judged as "poor" diets.

TABLE VII

CONSUMPTION OF THE BASIC FOOD GROUPS
(SCHOOL E* -- DATA ON 99 CHILDREN)

	Pupils - School E*					
Food Group	No Servings	Per cent of Total	Total Adequate Servings	Per cent of Total	Total Inadequate Servings	Per cent of Total
Green and Yellow Vegetables	38	38.4	17	17.2	44	44.4
Citrus Fruits	57	57.6	8	8.1	34	34.3
Potatoes	49	49.4	11	11.1	39	38.5
Other Fruits and Vegetables	58	58.6	1	1.0	40	40.4
Milk and Milk Products	16	16.1	13	13.1	70	70.8
Meat, Fish and Poultry	11	1.1	76	76.7	21	22.2
Eggs	37	37.3	22	22.2	40	40.5
Bread and Cereals	3	3.0	50	50.5	46	46.5
Butter or Fortified Margarine	57	57.6	3	3.0	39	39.4

* Experimental group.

Table VII gives additional food habit data collected

from three day dietary surveys of the ninety-nine children. In analyzing consumption of basic food groups, it was found that only in one instance were adequate amounts consumed. Three-fourths (76.7 per cent) of the children received sufficient amounts of meat, fish, and poultry. Only 17.2 per cent of the children consumed adequate amounts of green and yellow vegetables, 8.1 per cent, citrus fruits, 11.1 per cent, potatoes, 1 per cent, other fruits or vegetables, 13.1 per cent, milk and milk products, 22.2 per cent, eggs, 50.5 per cent, breads and cereals, and 3 per cent, butter or fortified margarine. However, proteins, which are considered relatively expensive, were the only foods consumed in adequate amounts. As the writer has indicated earlier in this paper, School E represents the lowest socio-economic group of schools chosen for study, yet, adequate amounts of expensive foods are consumed. This may possibly indicate factors similar to those discussed in the case of School A. (See pages 37-39).

Following nine and one-half months of intensive classroom instruction in nutrition and participation in the noonday lunch program, a second physical appraisal was made. Results have been compiled in table and graphic form for objective comparison and analysis. Height-weight comparisons of pupils in School E have been compiled and tabulated according to age and sex groupings in order to determine height

and weight increase. (See Appendix 6).

Height-weight tabulations revealed some very interesting facts. Study of Figures III and IV shows that height-weight increases were considerably greater after participation in the school lunch program and with intensive accompanying nutrition education instruction. However, the writer is aware that under normal growth patterns obvious increases would be made. It should be remembered that the children involved in this study were in the lowest percentile group. Under ordinary circumstances it is reasonable to assume that the progress made by these children in nine and one-half months exceeds what might be expected in even a year by children so undernourished. Figures III and IV indicate that for the most part increases for boys and girls were similar, girls sometimes exceeding boys, and vice-versa. To point out one seemingly significant advance, attention is directed to the study of eight year old boys. It will be noted that height increase of boys almost doubled that of girls, while the girls exceeded in weight. In the case of the twelve year olds, no spectacular growth increases were revealed, but a substantial weight increase is notable. Since only one meal was furnished under the school lunch program and no control could be exerted over the other two meals consumed in the home, the writer could not and, if fact, did not anticipate exceptional growth results. It should be remembered that though the number of children involved in the experimental project was relatively

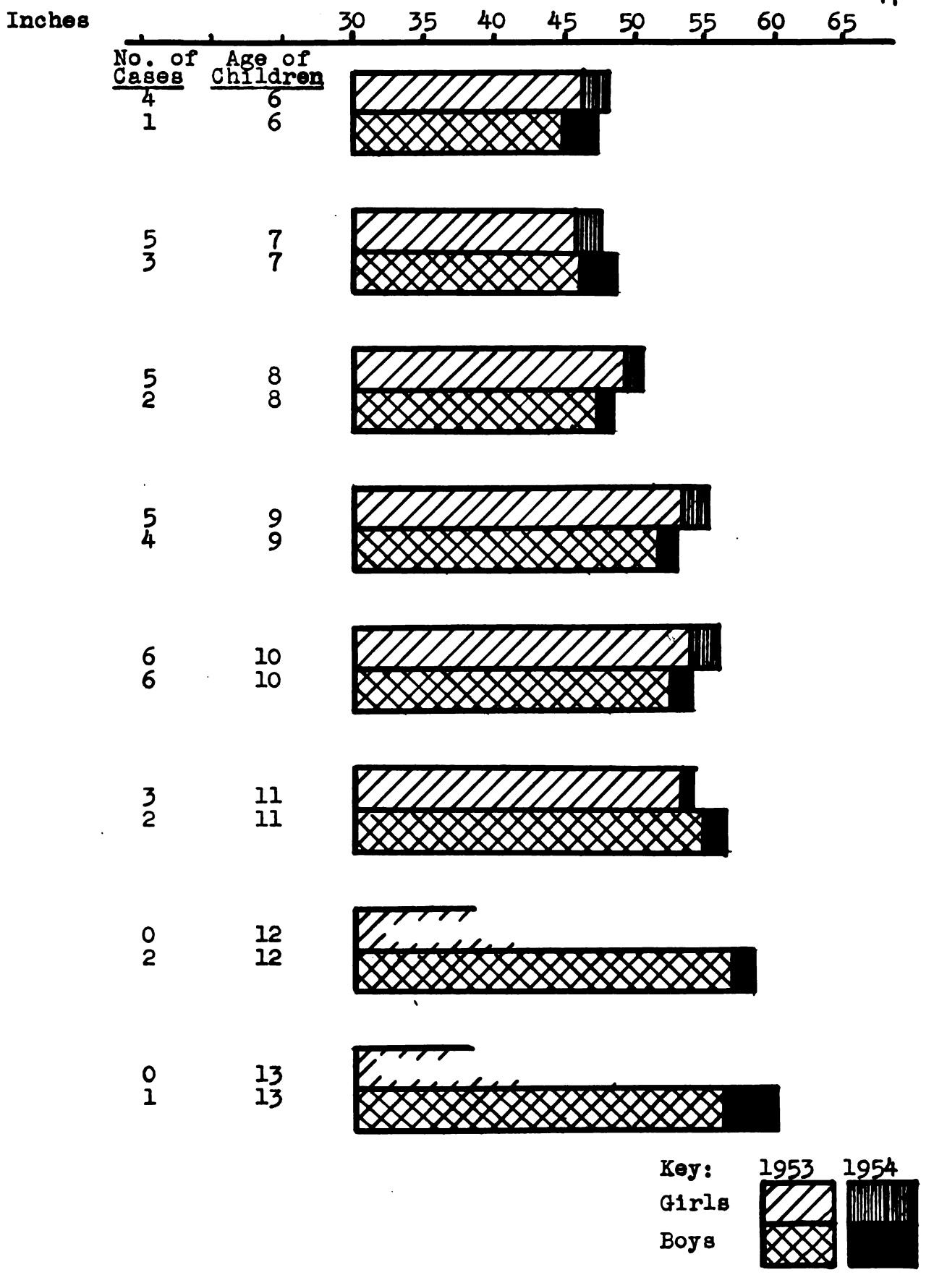


FIGURE III. COMPARISON OF HEIGHT GROWTH BY YEARS OF GIRLS AND BOYS IN SCHOOL E

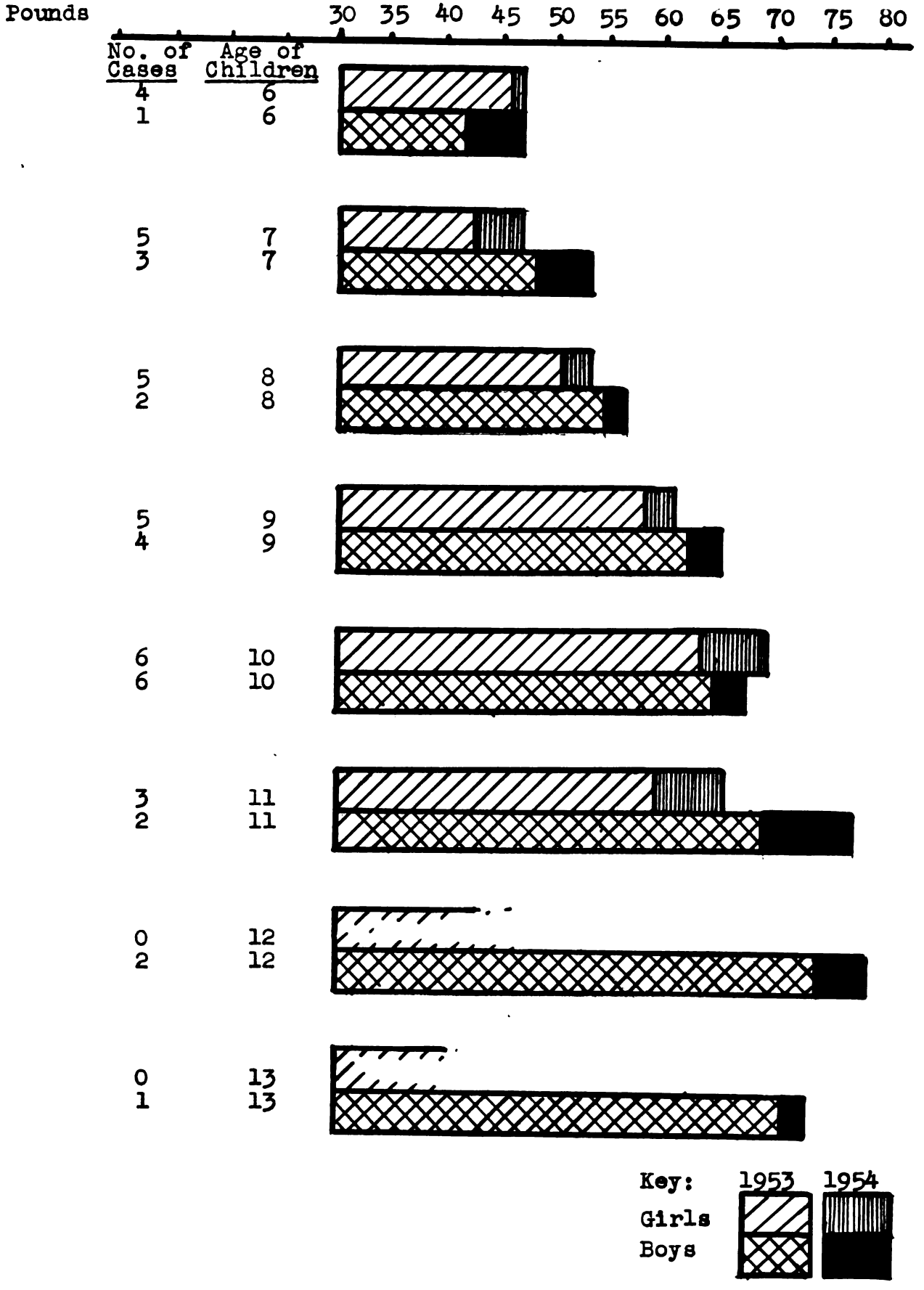


FIGURE IV. COMPARISON OF WEIGHT GROWTH BY YEARS OF GIRLS AND BOYS IN SCHOOL E

small, the findings, however, are believed to have value as they present a means of approaching the problem and educators need to be aware of their importance as a process. While the school lunch program is not presented here as a cure-all, it may be one means of meeting the problem with a constructive solution.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

It was the intention of the writer to study the dietary habits of a group of elementary school children, to determine whether or not there were unmet nutritional needs, and, if there were, what contribution the school lunch program could offer to meet them; to discover if a relationship existed between the nutritional status in high and low socio-economic groups; and to show whether nutritional status could be improved through participation in the school lunch program.

Food habit surveys and physical appraisals were made of 1757 elementary school children. The data utilized took into account numbers of essential food servings included in each meal for three days. To determine adequacy, dietary records were evaluated through tabulation of nine food groups rather than the familiar Basic Seven.

In the case of School E, the experimental group, children whose measurements fell in the "very low" percentile group were selected and recommended for participation in the school lunch program. An intensive instructional program was included during the 1953-1954 school year for those chosen for study. Following emphasized nutrition instruction and participation in the school lunch program, a second physical

appraisal was provided as a basis of evaluation.

A summary of the findings show that:

1. Faulty dietary patterns existed in all schools surveyed. School A, representing families of a low socio-economic group, were found to have poorest food habits of groups studied. School lunch facilities are not provided in School A.
2. School B, representing families from low socio-economic areas, compared favorably with schools of higher income. It would seem reasonable to assume that the lunch program provided these children with added nutritional advantage.
3. In spite of high socio-economic background of Schools C and D, many of the children were found to have poor dietary practices. Educational attainment or economic status of parents apparently does not guarantee adequate consumption of basic food groups.
4. Citrus fruit and green and yellow vegetables were noticeably lacking in diets, as well as sufficient amounts of other fruits and vegetables.
5. High consumption of proteins was evidenced in all schools surveyed.
6. In the case of School E, consumption of adequate amounts of basic foods was noticeably lacking

in all instances, with exception of protein foods. Height-weight increases were evidenced following classroom instruction in nutrition and participation in the noonday lunch program.

Data from this study correspond favorably with results found in reviewed studies -- that regardless of economic level, age, or locality, school children generally have poor food habits. Low consumption of green and yellow vegetables, citrus fruits, and milk are common among children. Children's nutritional and physical status can be improved through school lunch participation.

RECOMMENDATIONS

The observations made during the course of this study have led the writer to make the following recommendations:

1. The effectiveness of nutrition education in home and school needs to be evaluated. Careful consideration should be given to improving techniques of teaching nutrition to children and adults with the objective of improving food habits constantly uppermost.
2. Nutrition education should stress not only selection of foods from basic food groups for an adequate diet, but individualize instruction in terms of pupil needs. In this survey, the

findings of dietary weaknesses, as well as special emphases for instruction, have been made available for teachers and administrators to use in solving nutritional problems of children. For example, the need for additional learning concerning the importance of green and yellow vegetables in the diet, their purpose and function, appeared in one case to be a good starting point.

3. The findings related to dietary weaknesses, as well as suggestions for instruction in nutrition have been made available for teachers, parents, and administrators in helping children solve their nutritional problems.
4. Noon lunch facilities are urgently recommended for all school children from the standpoint both of supplemental feeding and provision for a "living" situation for nutrition education.
5. Teachers, parents, and administrators should be encouraged to envision the full potentialities of the school lunch in improving child health. The writer believes that an interest has been created among parents to participate in studies of this type. However, other experiences, such as educational programs, study groups, parent-

teacher planning need to be considered beyond this point. Perhaps newer types of innovations need to be discovered by teachers and administrators as they continue to plan educational programs for adults and children in their respective school centers.

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APPENDIXES

Appendix 1. Health Records

THESE ARE THE FOODS I ATE AND DRANK ON SUNDAY

At BREAKFAST (name foods and give amounts, such as one egg):

1. _____ _____ 5. _____ _____

2. _____ _____ 6. _____ _____

3. _____ _____ 7. _____ _____

4. _____ _____ 8. _____ _____

Between breakfast and noon (name foods and give amounts, such as grapefruit juice, one half cup):

1. _____ 3. _____ _____

2. _____ _____ 4. _____ _____

At NOON (name foods and give amounts, such as green peas, one half cup):

1. _____ _____ 5. _____ _____

2. _____ _____ 6. _____ _____

3. _____ _____ 7. _____ _____

4. _____ _____ 8. _____ _____

Between noon and the evening meal (name foods and give amounts, such as ice cream, one dip):

1. _____ _____ 3. _____ _____

2. _____ _____ 4. _____ _____

At the EVENING MEAL (Name foods and give amounts, such as fruit salad of oranges, apples, raisins, three-fourths cup):

1. _____ 5. _____ _____

2. _____ _____ 6. _____ _____

3. _____ _____ 7. _____ _____

4. _____ _____ 8. _____ _____

Between the evening meal and going to bed (name foods and give amounts):

1. _____ _____ 2. _____ _____

I had a source of Vitamin D (400 units) today. Yes No.
(From fish liver oil, vitamin D milk, vitamin drops or pills).

I used iodized salt on my food today. Yes No.

THESE ARE THE FOODS I ATE AND DRANK ON MONDAY

At BREAKFAST (name foods and give amounts, such as one egg):

1. _____ _____ 5. _____ _____
2. _____ _____ 6. _____ _____
3. _____ _____ 7. _____ _____
4. _____ _____ 8. _____ _____

Between breakfast and noon (name foods and give amounts, such as grapefruit juice, one half cup):

1. _____ _____ 3. _____ _____
2. _____ _____ 4. _____ _____

At NOON (name foods and give amounts, such as green peas, one half cup):

1. _____ _____ 5. _____ _____
2. _____ _____ 6. _____ _____
3. _____ _____ 7. _____ _____
4. _____ _____ 8. _____ _____

Between noon and the evening meal (name foods and give amounts, such as ice cream, one dip):

1. _____ _____ 3. _____ _____
2. _____ _____ 4. _____ _____

At the EVENING MEAL (name foods and give amounts, such as fruit salad of oranges, apples, raisins, three-fourths cup):

1. _____ _____ 5. _____ _____
2. _____ _____ 6. _____ _____
3. _____ _____ 7. _____ _____
4. _____ _____ 8. _____ _____

Between the evening meal and going to bed (name foods and give amounts):

1. _____ _____ 2. _____ _____

I had a source of Vitamin D (400 units) today (from fish liver oil, vitamin D milk, vitamin drops or pills) Yes No

I used iodized salt on my food today. Yes No.

THESE ARE THE FOODS I ATE AND DRANK ON TUESDAY

At BREAKFAST (name foods and give amounts, such as one egg):

1. _____ 5. _____
2. _____ 6. _____
3. _____ 7. _____
4. _____ 8. _____

Between breakfast and noon (name foods and give amounts, such as grapefruit juice, one-half cup):

1. _____ 3. _____
2. _____ 4. _____

At NOON (name foods and give amounts, such as green peas, one-half cup):

1. _____ 5. _____
2. _____ 6. _____
3. _____ 7. _____
4. _____ 8. _____

Between noon and the evening meal (name foods and give amounts, such as ice cream, one dip):

1. _____ 3. _____
2. _____ 4. _____

At the EVENING MEAL (name foods and give amounts, such as fruit salad of oranges, apples, raisins, three-fourths cup):

1. _____ 5. _____
2. _____ 6. _____
3. _____ 7. _____
4. _____ 8. _____

Between the evening meal and going to bed (name foods and give amounts):

1. _____ 2. _____

I had a source of Vitamin D (400 units) today. Yes No
(From fish liver oil, vitamin D milk, vitamin drops or pills).

I used iodized salt on my food today. Yes No.

(C/R General Mills 1947).

Appendix 2. Percentile Tables

Milwaukee Health Dept.

HEIGHT AND WEIGHT PERCENTILE TABLES - 4 Yrs. to 18 Yrs.

(Stuart and Meredith)

B O Y S

Yrs.	Weight in Pounds 3%	10%	25%	50%	75%	90%	97%	Yrs.
4	30	32	34	36-1/2	39	41-1/2	44-1/4	4
4½	31-1/2	33-3/4	35-3/4	38-1/2	41-1/2	44	47-1/2	4½
5	34	36	38-1/2	41-1/2	45-1/4	48-1/4	51-3/4	5
5½	36-1/4	38-3/4	42	45-1/2	49-1/4	53	56-1/2	5½
6	38-1/2	41	44-1/2	48-1/4	52	56-1/2	61	6
6½	40-3/4	43-1/2	47	51-1/4	55-1/2	60-1/2	65-1/2	6½
7	43	45-3/4	49-3/4	54	58-3/4	64-1/2	70	7
7½	45-1/2	48-1/2	52-1/2	57	62	68-3/4	74-3/4	7½
8	48	51-1/4	55-1/2	60	65-1/2	73	79-1/2	8
8½	50-1/4	53-3/4	58-1/4	63	69	77	84-1/2	8½
9	52-1/2	56-1/4	61	66	72-1/4	81	89-3/4	9
9½	54-3/4	58-3/4	63-3/4	69	76	85-1/2	95	9½
10	56-3/4	61	66-1/4	72	79-1/2	90	100	10
10½	59-1/4	63-3/4	69	74-3/4	83-1/2	94-1/2	105-3/4	10½
11	61-3/4	66-1/4	71-1/2	77-1/2	87-1/4	99-1/4	111-3/4	11
11½	64-1/2	69-1/4	74-1/2	81	91-1/2	104-1/2	118	11½
12	67-1/4	72	77-1/2	84-1/2	96	109-1/2	124-1/4	12
12½	69-1/2	74-1/2	80-1/2	88-3/4	102	116-1/2	131	12½
13	72	77	83-3/4	93	108	123-1/4	138	13
13½	76	82-1/4	89-1/2	100-1/4	115-1/2	130	144-1/4	13½
14	79-3/4	87-1/4	95-1/2	107-1/2	123	137	150-1/2	14
14½	85-1/2	93-1/4	102	114	129	142-1/2	156	14½
15	91-1/4	99-1/2	108-1/4	120	135	147-3/4	161-1/2	15
15½	97-1/2	105-1/4	113-1/2	125	139-3/4	152-1/2	166	15½
16	103-1/2	111	118-3/4	129-3/4	144-1/2	157-1/4	170-1/2	16
16½	107	114-1/4	121-1/2	133	148	161	173	16½
17	110-1/2	117-1/2	124-1/2	136-1/4	151-1/2	164-1/2	175-1/2	17
17½	111-3/4	118-3/4	125-3/4	137-1/2	153-1/2	166-3/4	177-1/4	17½
18	113	120	127	139	155-3/4	169	179	18

HOW TO MEASURE WEIGHT: Check beam-type platform scales for balance at beginning of clinic and adjust if needed. Have child remove shoes and sweater or jacket. Request child to stand in center of platform of scales. As weight is read be sure child's hands are not in contact with scale or wall. Subtract weight of gym suit if indicated. Determine weight to nearest one-quarter pound and record.

DESCRIPTIVE TERMS IN WEIGHT (Corresponding to Percentile Groups)

3%	10%	25%	50%	75%	90%	97%
very lt.	light	mod. lt.	ave.	mod.heavy	heavy	very heavy

INTERPRETATION: Consult weight or height percentile tables for appropriate sex and age to nearest half year. Locate the percentile nearest to the (height or weight) measurement. Record percentile (OVER)

8

Milwaukee Health Dept.

HEIGHT AND WEIGHT PERCENTILE TABLES - 4 Yrs. to 18 Yrs.
(Stuart and Meredith)

G I R L S

Yrs.	Weight in Pounds 3%	10%	25%	50%	75%	90%	97%	Yrs.
4	29-1/4	31-1/4	33-1/2	36-1/4	39-1/2	43-1/2	48-1/4	4
4½	30-3/4	33	35-1/4	38-1/2	42	46-3/4	51	4½
5	33	35-1/2	38	41	44-1/2	48-3/4	52-1/4	5
5½	35	38	40-3/4	44	47-1/4	51-1/4	55-1/2	5½
6	37-1/4	39-1/2	43	46-1/2	50-1/4	54-1/4	58-3/4	6
6½	39-3/4	42-1/4	45-1/2	49-1/2	53-1/4	57-3/4	63	6½
7	41-1/4	44-1/2	48	52-1/4	56-1/4	61-1/4	67-1/4	7
7½	43-1/4	46-1/2	50-1/2	55-1/4	59-3/4	65-1/2	73	7½
8	45-1/4	48-1/2	53	58	63-1/4	70	79	8
8½	47-1/4	50-1/2	55-1/2	61	67	74-1/2	84-1/2	8½
9	49	52-1/2	58	63-3/4	70-1/2	79	90	9
9½	51-1/4	55	60-1/2	67	74-3/4	84-1/2	96	9½
10	53-1/4	57	62-3/4	70-1/4	79	89-3/4	102	10
10½	55-1/2	60	66-1/2	74-1/2	84	95	107-1/2	10½
11	58	62-1/2	70	78-3/4	89	100-1/2	113	11
11½	60-3/4	66	74	83-1/4	94	106	120-1/4	11½
12	63-1/2	69-1/2	78	87-1/2	98-3/4	111-1/2	127-3/4	12
12½	68	74-3/4	83-3/4	93-1/2	105	118	135	12½
13	72-1/4	80	89-1/2	99	111	124-1/2	142-1/4	13
13½	77-3/4	85-1/2	94-1/2	103-3/4	115-1/2	129	146-1/2	13½
14	83	91	99-3/4	108-1/2	119-3/4	133-1/4	150-3/4	14
14½	86	94-1/4	102-1/2	111	121-3/4	135-3/4	153	14½
15	89	97-1/2	105	113-1/2	124	138	155-1/4	15
15½	90-1/2	99-1/4	106-3/4	115-1/4	125-1/2	139-1/2	156-1/2	15½
16	91-3/4	101	108-1/2	117	127-1/4	141	157-3/4	16
16½	92-3/4	102	109-1/2	118	128-1/2	142-1/4	158-1/2	16½
17	94	102-3/4	110-1/2	119	129-1/2	143-1/4	159-1/2	17
17½	94-1/4	103-1/4	110-3/4	119-1/2	130-1/4	144	160	17½
18	94-1/2	103-1/2	111-1/4	120	130-3/4	144-1/2	160-3/4	18

(cont.from other side) groups nearest the measurement, adding + or - as indicated. If measurement is exactly halfway between two percentile groups indicate this by (3-10) using the actual percentiles between which it falls.

USUAL FINDINGS

a. Weight measurements for a child usually fall in the same percentile group at succeeding ages or change only gradually from period to period.

b. Height and weight often differ in their actual percentile positions, but tend to maintain the same general relationship from period to period.

c. Most (80%) of the weight measurements of a group of children at a given age would be expected to fall between the 10th and 90th percentiles.

d. Make allowance for adolescent spurt in girls between 10 and 14 yrs. and boys between 11 and 16 yrs.

Milwaukee Health Dept.

HEIGHT AND WEIGHT PERCENTILE TABLES - 4 Yrs. to 18 yrs.
(Stuart and Meredith)

B O Y S

Height in Inches	3%	10%	25%	50%	75%	90%	97%	Height in Inches
4 *	38-1/2	39	39-3/4	40-3/4	42	42-3/4	43-1/2	4 *
4½*	39-1/2	40-1/4	41	42	43-1/4	44-1/4	45	4½*
5	40-1/4	41-1/4	42-1/4	43-1/4	44-1/2	45-1/2	46-1/2	5
5½	41-1/2	42-1/2	43-3/4	45	46-1/4	47-1/4	48	5½
6	42-3/4	43-3/4	45	46-1/4	47-1/2	48-1/2	49-3/4	6
6½	43-3/4	45	46	47-1/2	49	50	51	6½
7	45	46	47-1/2	49	50-1/4	51-1/2	52-1/2	7
7½	46	47-1/4	48-1/2	50	51-1/2	52-3/4	53-3/4	7½
8	47	48-1/2	49-3/4	51-1/4	52-3/4	54	55-1/4	8
8½	48	49-1/2	50-3/4	52-1/4	54	55	56-1/4	8½
9	49	50-1/2	51-3/4	53-1/4	55	56	57-1/4	9
9½	49-3/4	51-1/2	52-3/4	54-1/4	56	57	58-1/4	9½
10	50-3/4	52-1/4	53-3/4	55-1/4	56-3/4	58	59-1/4	10
10½	51-1/2	53-1/4	54-1/2	56	57-3/4	59	60	10½
11	52-1/2	54	55-1/4	56-3/4	58-3/4	59-3/4	60-3/4	11
11½	53-1/2	55	56-1/4	57-3/4	59-1/2	61	62-1/4	11½
12	54-1/2	56	57-1/4	59	60-1/2	62-1/4	63-3/4	12
12½	55-1/4	57	58	60	62	63-1/2	65-1/4	12½
13	56	57-3/4	59	61	63-1/4	65	66-3/4	13
13½	56-3/4	58-3/4	60-1/4	62-1/2	64-3/4	66-1/2	68-1/4	13½
14	57-1/2	60	61-1/2	64	66-1/4	68	69-3/4	14
14½	58-3/4	61	62-3/4	65	67-1/4	68-3/4	70-3/4	14½
15	59-3/4	62	64	66	68	69-1/2	71-1/2	15
15½	60-3/4	63	64-3/4	66-3/4	68-3/4	70-1/4	72-1/4	15½
16	61-1/2	64	65-3/4	67-3/4	69-1/2	70-3/4	73	16
16½	62	64-1/2	66-1/4	68	69-3/4	71	73-1/4	16½
17	62-1/2	65-1/4	66-3/4	68-1/2	70	71-1/2	73-1/2	17
17½	62-3/4	65-1/4	67	68-1/2	70-1/4	71-1/2	73-3/4	17½
18	62-3/4	65-1/2	67	68-3/4	70-1/2	71-3/4	74	18

HOW TO MEASURE HEIGHT: Use wooden headpiece and accurate yardstick firmly fastened to wall. Measure height with shoes removed. Request child to stand with (a) heels, buttocks, upper part of back, and rear of head in contact with wall, (b) heels nearly together but not touching each other, (c) arms hanging at sides in natural manner, (d) head facing straight forward (tragus of ear and lower border of bony orbit in plane parallel to floor). Place wooden headpiece against yardstick and press firmly against child's head. Take two or more separate height measurements until two measurements correspond; record that measurement to nearest one-fourth inch.

DESCRIPTIVE TERMS OF HEIGHT (Corresponding to Percentile Groups):

3%	10%	25%	50%	75%	90%	97%
very short	short	mod.short	ave.	mod.tall	tall	very tall

INTERPRETATION: Consult weight or height percentile tables for appropriate sex and age to nearest half year. Locate the percentile nearest to the (height or weight) measurement. Record percentile groups nearest (OVER)

Milwaukee Health Dept.

HEIGHT AND WEIGHT PERCENTILE TABLES - 4 Yrs. to 18 Yrs.

(Stuart and Meredith)

G I R L S

Yrs.	Height in Inches 3%	10%	25%	50%	75%	90%	97%	Height in Inches Yrs.
4 *	37-1/2	38-1/2	39-1/2	40-1/2	41-1/2	43	44-1/4	4
4½*	38-1/2	39-3/4	40-3/4	42	43	44-3/4	45-3/4	4½
5	40	41	42	43	44-1/4	45-1/2	46-3/4	5
5½	41-1/4	42-1/2	43-1/2	44-1/2	45-3/4	46-3/4	48	5½
6	42-1/2	43-1/2	44-1/2	45-1/2	47	48	49-1/2	6
6½	43-3/4	44-3/4	45-3/4	47	48-1/4	49-1/2	50-3/4	6½
7	45	46	47	48	49-1/2	50-3/4	52	7
7½	46	47	48	49-1/4	50-3/4	52	53	7½
8	47	48	49	50-1/2	51-3/4	53	54	8
8½	47-3/4	49	50	51-1/2	53	54	55-1/4	8½
9	48-3/4	50	51	52-1/4	54	55-1/4	56-1/2	9
9½	49-1/2	51	52	53-1/2	55	56-1/2	57-3/4	9½
10	50-1/4	51-3/4	53	54-1/2	56	57-1/2	58-3/4	10
10½	51-1/4	53	54	55-3/4	57-1/2	59	60-1/2	10½
11	52	54	55-1/4	57	58-3/4	60-1/2	62	11
11½	53-1/4	55	56-1/4	58-1/4	60-1/4	61-3/4	63-1/2	11½
12	54-1/4	56	57-1/2	59-3/4	61-1/2	63-1/4	64-3/4	12
12½	55-1/2	57-1/2	58-3/4	60-3/4	62-1/2	64	65-1/2	12½
13	56-1/2	58-3/4	60	61-3/4	63-1/2	65	66-1/4	13
13½	57-1/2	59-1/2	60-3/4	62-1/2	64	65-1/4	66-3/4	13½
14	58-1/4	60-1/4	61-1/2	62-3/4	64-1/2	65-3/4	67-1/4	14
14½	58-3/4	60-3/4	61-3/4	63	64-3/4	66	67-1/2	14½
15	59	61	62	63-1/2	65	66-1/4	67-1/2	15
15½	59-1/4	61-1/4	62-1/4	63-3/4	65	66-1/2	67-3/4	15½
16	59-1/2	61-1/2	62-1/2	64	65-1/4	66-1/2	67-3/4	16
16½	59-1/2	61-1/2	62-1/2	64	65-1/2	66-1/2	67-3/4	16½
17	59-1/2	61-1/2	62-1/2	64	65-1/2	66-3/4	67-3/4	17
17½	59-1/2	61-1/2	62-1/2	64	65-1/2	66-3/4	67-3/4	17½
18	59-1/2	61-1/2	62-1/2	64	65-1/2	66-3/4	67-3/4	18

(Cont.from other side) the measurement, adding + or - as indicated. If measurement is exactly halfway between two percentile groups indicate this by (3 - 10) using the actual percentiles between which it falls.

FINDINGS WHICH MAY BE REVIEWED FOR GROWTH FAILURE: Children with weight and height measurements which:

a. Fall in different percentile groups.

b. Shift percentile groups is subsequent measurements.

c. Fall near to or outside the 3rd or 97th percentile may be referred for repeat measurements by district nurse and if confirmed referred for medical review.

**Length not height.

Appendix 3. Food Summary Record

School_____ Grade_____ Teacher_____ Room_____

Number of Pupils Participating_____

Pupils	Food Groups												
	1. Green & Yellow Veg.	2. Citrus Fruits	3. Potatoes	4. Other Veg. & Fruits	5. Milk & Milk Products	6. Meat, Etc.	7. Eggs	8. Bread & Cereals	9. Butter & Margarine	10. Iodized Salt	11. Source of Vitamin D	Total Score on Diets	Classification of Diets (Good, Fair, Poor)
1.													
2.													
3.													
4.													
5.													
6.													
7.													
8.													
9.													
10.													
11.													
12.													
13.													
14.													
15.													
16.													
17.													
18.													
19.													
20.													
21.													
22.													
23.													
24.													
25.													
26.													
27.													
28.													
29.													
30.													

Classification of Diets

	No.	Percent
Good		
Fair		
Poor		

KEY

0 = no servings in three days
1 = inadequate number of servings
2 = inadequate number of servings
3 = adequate amount for three days

DIET CLASSIFICATION

Good = 80% or more of recommended allowances
Fair = 61% - 80% of recommended allowances
Poor = 60% or less of recommended allowances

SCORE SHEET FOR THREE-DAY FOOD RECORD

Based on recommended allowances for elementary school children

(See Directions for Evaluating the Pupil Food Record, Survey Item 6)

Pupil Record No._____ Name_____ Grade_____ Date_____

School_____ Classification of diet*: Good Fair Poor (Circle one)

Food Groups	Number of Servings**	Rating 0	1	2	3	Diet Score
1. Green and yellow vegetables (some raw, some cooked, or canned). Average serving***: ⅔ cup cooked or 1 cup raw		none	one	two	three	1.
2. Oranges, tomatoes, grapefruit, raw cabbage, or salad greens. Average serving: 1 orange, 1 tomato, ½ grapefruit, 1 cup raw greens, or ½ cup juice		none	one	two	three	2.
3. Potatoes. Average serving: ½ cup cooked		none	one	two	three	3.
4. Other vegetables and fruits (raw, dried, cooked, or canned). Average serving: ½ cup cooked		none	two	four	six	4.
5. Milk and milk products (fluid, dried, or evaporated) or cheese. Average serving: 1 cup fluid milk or 1 cubic inch of cheese		none	three	six	nine	5.
6. Meat, fish, poultry, dried beans or peas, nuts, or peanut butter. Average serving: 2 or 3 oz. meat or fish, 4 tbs. of peanut butter, 4-8 nuts, ½ cup cooked beans or peas		none	one	two	three	6.
7. Eggs or egg custard. Average serving: 1 egg		none	one	two	three	7.
8. Bread, flour, cereals (whole grain or enriched). Average serving: 1 slice bread, ½ cup cooked or 1 cup prepared cereal, 1 griddle cake or waffle		none	three	six	nine	8.
9. Butter or fortified margarine. Average serving: 1 teaspoon		none	three	six	nine	9.
					Total Score	

*The following classification of diets is based upon the standards proposed by the Food and Nutrition Board of the National Research Council in 1948 for children 7 to 9 years of age. Diets are rated as follows:

A diet is poor if the total score is 18 or lower or if it includes no milk. This diet represents 60% or less of the recommended allowances.

A diet is fair if the total score is 19, 20 or 21 and the score on milk is at least 1. This diet represents 61% to 80% of the recommended allowances.

A diet is good if the total score is 22 or higher and the score on milk is 2 or 3. This diet represents 80% or more of the recommended allowances.

**Food groups and number of servings are adapted from *Nutrition Education in the Elementary School,* Federal Security Agency, U.S. Office of Education, in cooperation with U.S. Department of Agriculture, August, 1943, p. 4.

***Amounts considered as average servings are adapted from *Menu-Planning Guide for School Lunches,* W.F.A., NFC-10, Revised, September, 1944, pp. 2-3 and "Food Composition Table for Short Method of Dietary Analysis," Donelson, Eva G., and Leichsenring, Jane M., *Jour. Amer. Diet. Assn.* 18:429-439, 1942. (Revised March 1, 1945).

This score sheet and accompanying Food Survey Forms were developed by Willa Vaughn Tinsley in connection with a doctoral study under the direction of Clara Brown Arny and Jane M. Leichsenring, University of Minnesota.

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A3678

Pupil Record No. ___ Name _____ Grade _____ Age _____

School _____ Classification of diets: Good Fair Poor (Circle one)

Food Groups	No. of Serv's	Rating 0	1	2	3	Diet Score
1. Green and yellow vegetables (some raw, some cooked, or canned). Av. serv: 2/3 cup cooked or 1 cup raw.		none	one	two	three	1.
2. Oranges, tomatoes, grapefruit, raw cabbage, or salad greens. Av. serving: 1 orange, 1 tomato, or 1/2 grapefruit, 1 cup raw greens, or 1/2 cup juice.		none	one	two	three	2.
3. Potatoes. Av. serving: 1/2 cup cooked.		none	one	two	three	3.
4. Other vegetables and fruits (raw, dried, cooked, or canned). Av. serving: 1/2 cup cooked.		none	two	four	six	4.
5. Milk and milk products (fluid, dried, or evaporated) or cheese. Av. serving: 1 cup fluid milk or 1 cubic inch of cheese.		none	three	six	nine	5.
6. Meat, fish, poultry, dried beans or peas, nuts, or peanut butter. Av. serving: 2 or 3 oz. meat or fish, 4tbs. of peanut butter, 4-8 nuts, 1/2 cup cooked beans or peas.		none	one	two	three	6.
7. Eggs or egg custard. Av. serving: 1 egg.		none	one	two	three	7.
8. Bread, flour, cereals (whole grain or enriched). Av. serving: 1 slice bread, 1/2 cup cooked or 1 cup prepared cereal, 1 griddle cake or waffle.		none	three	six	nine	8.
9. Butter or fortified margarine. Av. ser: 1 tsp.		none	three	six	nine	9.
10. Vitamin D (400) units		none	one	two	three	10.
11. Iodized salt.		none	one	two	three	11.

Pupil Food Score Sheet

Total Score _____

Appendix 4. Medical Health Reports

MEDICAL REFERRAL CARD FOR PARENTS

(Name)_____

Weighs _____pounds

and measures ____ inches in height.

These measurements may indicate that your child has a health need as follows:

Overweight	Very tall
Underweight	Very short
Under par	

_____
Principal

Your Child May Have an Unmet Health Need

Growth at the right rate is important to your child's progress in school. A child who is overweight or very tall, underweight or very small, or who is under par, may have an important health need.

Within the near future the Milwaukee Health Department will ask you either to see your doctor or to arrange for a conference with your school nurse and school physician.

PHYSICAL EVALUATION REPORT FOR PARENTS

(Name)_____

Weighs _____pounds

and measures ____ inches in height.

This is normal growth for your child at this age.

Your child's food score is good, fair, poor, not done.

The right food is important to your child's progress in school. Give your child good food to eat every day.

_____
Principal

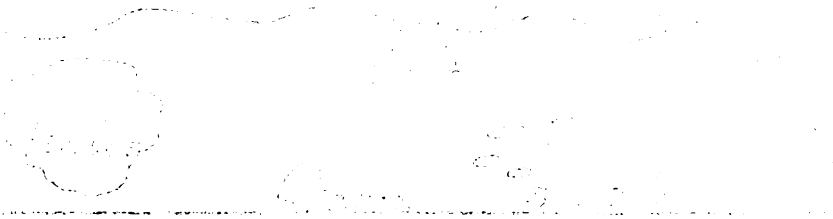
(See opposite side)

Be Sure Your Child Has A Good Diet

1. Green and yellow vegetables.
2. Citrus fruit.
3. Potatoes.
4. Other vegetables and fruits.
5. Milk and milk products.
6. Meat, fish, poultry.
7. Eggs.
8. Enriched or whole grain bread and cereals.
9. Butter and fortified margerine.
10. Source of vitamin D.
11. Iodized salt.

Your child needs more of any foods checked.

Appendix 5. Health Educators Instructional Material



May 11, 1954

[illegible] Grade
[illegible] Grade

[illegible] October

[illegible] planned to have
[illegible] in our room.
[illegible] come to school at
[illegible] April 14, 1954.
[illegible] we planned to bring
[illegible] a spoon, too.
[illegible] we had milk and
[illegible].
[illegible] and Mrs. Hebert.
[illegible]
[illegible] Jackson,
Gr. 3

[illegible] Milk

In the afternoon we
[illegible] our new vege-
[illegible] some carrots and
[illegible]. I met some
[illegible] brought an
[illegible] boys brought tomatoes.
[illegible] brought some apples and
[illegible]. I brought some

[illegible] Grisham, Gr. 2

****

Our Mural

We have a mural in our room.
We have vegetables on our mural.
[illegible] painted the background first.
[illegible] painted the vegetables on
[illegible] where they grow. Birds
[illegible] that peanuts were white un-
[illegible] ground.

Ronald Guy, Gr. 3

The Lunch [illegible]

I go to the [illegible]
When [illegible] is time [illegible]
calls us. Mrs. Fisher [illegible]
to all of us. The [illegible]
Miss Marie serves us.
Yesterday when I [illegible]
For lunch I like [illegible]
[illegible]

****

Our [illegible]

We have a [illegible]
We bring our vegetables [illegible]
In the afternoon we [illegible]
other things. We [illegible]
Mrs. Smith brought [illegible]
and apples and bananas, Mrs.
[illegible]

****

The Lunch [illegible]

I go to the lunchroom [illegible]
like Mrs. Fisher and [illegible]
They like the children. [illegible]
Marie is nice. Mrs. [illegible]
cook.
I like milk and I like [illegible]
they give us.

[illegible]

****

[illegible]

In the afternoon [illegible]
Nothing empty.
Wash or peel it.
Wash hands.
Chew with mouth [illegible]

(Teacher -- Mrs. Adean Smith)

Our Mural

We made a big mural on some brown paper. Michael spilled the green paint. I put a green root on the vegetables. But I changed it because the sun has to make things green and it can't get into the ground. We showed how the vegetables grow. You can see it in our room.

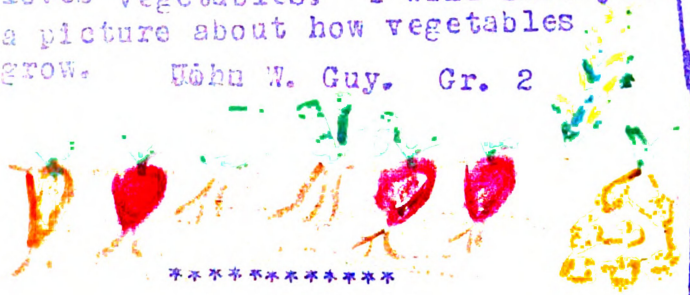
Birdo Grady. Gr. 3

****

Vegetables

Do you like vegetables? I do. My mother gives me vegetables every day. Do your mother give you vegetables? Every Day? My mother loves vegetables. I will show you a picture about how vegetables grow.

John W. Guy. Gr. 2



****

Our Vegetable Mural

We have a vegetable mural. You can see how vegetables grow. Michael spilled some green paint. John and Ernest spilled some paint, too. But it is pretty. We showed how to grow potatoes and things that grow under the ground and above the ground.

We learned many things about vegetables.

Mary Mac McClarity Gr. 2

****

Snack Club

I came from Lee School. I was glad to know I could bring raw vegetables or fruit to school. We eat in school. The vegetable raw is good.

Charles Vaughn, Gr. 2

The Lunchroom

I like to go to lunch. Miss Marie gives us chili. That's what I like[illegible]. Mrs. Fisher cooks lunch. The big boys at lunch pick up the dishes.

Ernest Rodgers, Gr. 3

Our Snacks

My story is about our Snack Club. I like to bring good food to school. We brought some apples from home to eat in school. Some boys and girls bring carrots.

Doris Anderson, Gr. 2

The Lunchroom

Miss Marie is good to us. Mrs. Fisher is good, too. She cooks. Monday Mrs. Smith lets all the children go with her.

Cranston Davis, Gr. 3

Our Breakfast

Early in the morning we came to school to eat breakfast. We ate oranges and I ate corn flakes, and we drank milk.

the end.

Marcus Jeter, Gr. 3

****

The Lunchroom

Monday Miss Marie gave us beef stew. We had grapefruit for dessert and milk. It was good. Yum-yum. I like it.

Marcus Jeter, Gr. 3

O U R

B R E A K F A S T

April 14, 1954

Dictated by children to teacher,

Mrs. Adean Smith

OUR BREAKFAST TOGETHER

One day we planned to have breakfast together at school. We planned to come to school at 8:30 on Wednesday morning, April 14, 1954.

Here are the plans we made together:

1. We will go to the store to buy the food together.
2. We will write letters to our mothers to tell about the breakfast.
3. We will find out what makes a good breakfast.
4. We decided to invite the principal and the school nurse.
5. We voted to see how much money to spend. Then we found out that we wanted to spend 15¢ each.

OUR MENU

We talked about what we would eat for breakfast. We looked at the Seven Basic Foods Chart. We looked at a Breakfast Chart. We looked at our money. Then we planned what to buy.

This was our menu:

An orange
Milk

Cereal with sugar and milk

(Bread and butter from home)

****

OUR COMMITTEES

We decided on having some committees to do the work. Some people wanted to set the tables. Some people wanted to clean up after breakfast. These were our committees:

1. Buying Committee
2. Decorations Committee
3. Dishes Committee
4. Guest Committee
5. Clean-up Committee

GETTING READY FOR OUR BREAKFAST

This was our News Bulletin for Monday, April 12, 1954:

News

Today is Monday, April 12, 1954. We are very busy getting ready for our breakfast together this Wednesday.

Minnie's mother said she would send a package of napkins. We will write a thank-you letter to her.

This is the kind of letter we wrote to our mothers:

Dear Mother,

We are planning to have breakfast together at school on Wednesday, April 14, 1954. Will you help me to earn 15¢ to pay for my food?

Your (son) (girl)

_____

LETTERS TO OUR GUESTS

This was the letter we sent to the principal:

Dear Mr. Radtke,

We are going to have breakfast together in our room on Wednesday morning, April 14, 1954. We want you to be our guest. Will you come at 8:40?

Boys and girls in
Room 23, and
the teacher.

This was the letter we sent to the school nurse:

Dear Mrs. Habeck,

We would like very much to have you eat breakfast with us in Room 23 at 8:40 on Wednesday morning, April 14, 1954.

We hope you can come.

Children in Room 23

On Monday and Tuesday we made place mats and place cards for the breakfast. We made some for our guests, too. We designed them ourselves. Some boys and girls made flowers on theirs. Some made food pictures. Some made scribble designs and filled them in with pretty colors.

We fixed our desks for the breakfast party. We cleaned them on the outside and on the inside, too. We scrubbed the tops of our desks.

We put food pictures all around our room. We planned to have the guests sit at the teacher's desk. We cleaned it and scrubbed the top. We wanted everything in our room to be clean for the party.

We talked and talked about what foods were good for breakfast.

OUR TRIP TO THE STORE

We asked the principal for permission to go to the store to buy the food. He said we could go at 1:30 Tuesday afternoon.

We went to the store together after the teacher found out that the storekeeper would help us to select the food. We walked by two's to Walnut Street and went into the grocery store on the corner. The storekeeper showed us the food. We asked these questions:

1. Do you have the cereal that comes in the kind of packages that you can eat out of? (The kind that has waxed paper on the inside into which the milk may be poured).

2. Do you sell enriched bread?

3. Which is cheaper, milk in small cartons, or milk by the gallon?

4. How do you sell sugar? We need one pound.

The storekeeper told us all the answers. We said we would send the committee to buy the food. Then we said "Thank you" and went back to school.

THE BUYING COMMITTEE

The Buying Committee went back to the store and bought the cereal, sugar, and oranges. They brought them to the room. They bought just enough for each child to have one box of cereal and one orange. Then they bought enough for the guests and their teacher. They told the storekeeper to order the milk in gallon jars because it was cheaper than buying a carton for each one.

When the Buying Committee showed the children what they had bought, every one said they had been good shoppers.

At recess, the committee asked some girls to help to wash the oranges. Then they covered them so they would be clean for breakfast.

The Dishes Committee got cups from the PTA cupboard. They got extra spoons for the guests. The children brought their own spoons. The Dishes Committee washed and dried all the cups and spoons.

THE BIG DAY COMES AT LAST

On the morning of the breakfast party, seven children came to school at 8 o'clock. They put the place mats on the desks and they put the place cards on the desks, too. They covered the teacher's desk with paper. They had to make it straight. Then it looked like a table cloth. They put a bouquet of daffodils on the guest table. They put place mats and place cards on the guest table, too.

The Dishes Committee came early, too. They put cups and oranges and spoons and cereal on the desks and on the guest table. Then they put sugar in the cups that had no handles. They passed the sugar.

The Buying Committee went to the store and bought the gallons of milk just before the party. One girl said she would not drink the milk if it was not cold. One girl said that wasn't the kind of milk her mother bought.

BREAKFAST IS READY

The officers of the Snack Club were the hosts and hostesses at the breakfast. They greeted the guests when they came. They took them to their seats.

When 8:30 came all the boys and girls came into the room. They had washed their hands in the hall. When the host told them to find their places, they did. Nobody started to eat until the host said, "Now we will all bow our heads and ask a blessing by ourselves." Then they watched to see when the host began to peel his orange. The boys and girls began to peel their oranges then, too. Some people needed help.

Then the boys and girls ate cereal from little boxes. Only one boy spilled his milk. Every one drank a cup of milk besides what was put on the cereal.

AFTER BREAKFAST

After the milk was gone and the cereal was gone, the children put the orange peelings in the cereal boxes. Then everyone wiped his or her mouth and hands with one of Minnie's napkins. Mr. Radtke was going to say something so everyone sat very still. He said he liked our breakfast. He was glad that we knew how to choose good food to eat.

The nurse said she liked our breakfast, too. She said she hoped that we had a good breakfast like that every morning. She said that was the kind of breakfast we could get all by ourselves.

Our teacher said that she liked <u>us</u> best of all.

When the guests were gone the committee picked up the PTA cups and washed them. The clean-up committee picked up cereal cartons and place mats and napkins. Some children kept their place mats. The rest were put in the waste paper basket.

THINKING BACK ON BREAKFAST

The children took turns washing their hands after the breakfast. Everyone had a fine time. Some children asked each other what they liked best. Here are what some children liked best:

1. "I liked the orange. It peeled easy."
2. "I liked the little box of cereal. I could pour the milk right in it."
3. "I liked an orange to peel."
4. "I liked to have breakfast at school. I was hungrier than when I am at home."
5. "I would like breakfast at school every day."

MONDAY:

Orange Juice
Barbecue Hamburger
on Bun
Buttered Whole Corn
Applesauce Cake
Milk

TUESDAY:

Mashed Potato and
Meat Gravy
Buttered Green Beans
Bread and Butter
Sandwich
Jello with Pears
Milk

WEDNESDAY:

Baked Beans
Cabbage Salad
Peanut Butter
Sandwich
Peaches
Milk

THURSDAY:

Vegetable Soup
Cheese Sandwich
Carrot and Celery
Sticks
Pineapple Upside-
Down Cake
Milk

FRIDAY:

Tomato Juice
Creamed Tuna Fish
and Peas
Oven Baked Potato
Bread and Butter
Fruit
Milk

Appendix 6. Additional Data

COMPARISON IN HEIGHT AND WEIGHT OF PUPILS IN SCHOOL E

1953 and 1954

1953							1954						
Case No.	Sex	Age in Years	Height in Inches	Average Height	Weight in Pounds	Average Weight	Case No.	Sex	Age in Years	Height in Inches	Average Height	Weight in Pounds	Average Weight
1	F	6	48-3/4		48		1	F	7	51		50-3/4	
2	F	6	45		42-1/2		2	F	7	45		42-1/2	
3	F	6	48-1/2		49		3	F	7	50-1/2		51	
4	F	6	45		42-1/2		4	F	7	46-1/2		44	
				46.8		45.5					48.2		47.0
5	M	6	45		42		5	M	7	47-3/4		47	
				45.0		42.0					47.75		47.0
6	F	7	46		45		6	F	8	49		50-1/4	
7	F	7	43-1/2		37		7	F	8	44		40-1/2	
8	F	7	42-1/4		31-1/2		8	F	8	43-1/2		36-1/4	
9	F	7	46-1/2		44		9	F	8	48-3/4		49	
10	F	7	51-1/2		52-1/2		10	F	8	53-1/4		59-3/4	
				45.9		42.0					47.7		47.1
11	M	7	47		51-1/2		11	M	8	50-1/4		60	
12	M	7	44		41		12	M	8	46-1/2		45	
13	M	7	48-1/2		52		13	M	8	50-1/4		55	
				46.5		48.1					49.0		53.3
14	F	8	48-1/2		43		14	F	9	51-1/2		50	
15	F	8	47		49-3/4		15	F	9	50		53	
16	F	8	50		51		16	F	9	50		51-1/2	
17	F	8	52-1/2		57		17	F	9	53-1/4		60	
18	F	8	49-1/2		50		18	F	9	49-1/2		50	
				49.5		50.1					50.8		52.9

COMPARISON IN HEIGHT AND WEIGHT OF PUPILS IN SCHOOL E (continued)

1953 and 1954

1953							1954						
Case No.	Sex	Age in Years	Height in Inches	Average Height	Weight in Pounds	Average Weight	Case No.	Sex	Age in Years	Height in Inches	Average Height	Weight in Pounds	Average Weight
19	M	8	45		44		19	M	9	46-1/4		45	
20	M	8	50-1/2		63		20	M	9	51		67-1/2	
				47.7		53.5					48.6		56.2
21	F	9	51-1/2		49-1/2		21	F	10	53-1/2		54	
22	F	9	57		70-1/2		22	F	10	60		79	
23	F	9	54		61-1/2		23	F	10	56		64-1/2	
24	F	9	54		53		24	F	10	54		53	
25	F	9	52		55		25	F	10	52		55-1/2	
				53.7		57.9					55.1		61.2
26	M	9	47-1/2		49-1/2		26	M	10	49-1/2		52-1/4	
27	M	9	55		69		27	M	10	55-3/4		71-1/2	
28	M	9	56-1/2		73-1/2		28	M	10	56-1/2		75	
29	M	9	49		55		29	M	10	53-1/4		59-1/2	
				52.0		61.7					53.7		64.5
30	F	10	50		52		30	F	11	52		52	
31	F	10	57		58		31	F	11	57-1/2		62	
32	F	10	50-1/2		58		32	F	11	52-1/4		63	
33	F	10	55-1/4		66		33	F	11	55-1/2		67-1/4	
34	F	10	56-1/2		80-1/2		34	F	11	59		91	
35	F	10	56		62		35	F	11	57		66	
				54.2		62.7					55.5		66.8
36	M	10	52		60		36	M	11	54		62	
37	M	10	59-1/2		77-1/2		37	M	11	59-1/2		78	

COMPARISON IN HEIGHT AND WEIGHT OF PUPILS IN SCHOOL E (continued)

1953 and 1954

1953							1954						
Case No.	Sex	Age in Years	Height in Inches	Average Height	Weight in Pounds	Average Weight	Case No.	Sex	Age in Years	Height in Inches	Average Height	Weight in Pounds	Average Weight
38	M	10	50		54		38	M	11	50		54	
39	M	10	50		54		39	M	11	50		54	
40	M	10	52		60		40	M	11	53-1/4		63	
41	M	10	54		80		41	M	11	57-1/2		88	
				52.9		64.2					54.0		66.5
42	F	11	56		53-1/2		42	F	12	57-3/4		69	
43	F	11	48		49-1/2		43	F	12	49		51	
44	F	11	56		74		44	F	12	56		74-1/4	
				53.3		59.0					54.2		64.7
45	M	11	59		81-1/2		45	M	12	61		94-1/4	
46	M	11	51		55-1/2		46	M	12	52-3/4		60-1/4	
				55.0		68.5					56.8		77.2
47	M	12	58		88-1/4		47	M	13	59-1/4		88-1/2	
48	M	12	56		60-1/2		48	M	13	58-1/2		67-1/4	
				57.0		74.2					58.8		77.8
49	M	13	56-1/2		71		49	M	14	57-3/4		73-1/4	
				56.5		71.0					57.7		73.2

COMPARISON IN HEIGHT AND WEIGHT INCREASE OF PUPILS IN SCHOOL E

TERMINATING EXPERIMENT, MAY, 1954

Sample	Sex	Age in Years	Height Increase (Inches)	Average Per Cent Increase	Weight Increase (Pounds)	Average Per Cent Increase
1	F	7	2-1/4		2-3/4	
2	F	7	0		0	
3	F	7	2		2	
4	F	7	1-1/2		1-1/2	
				2.99		3.29
5	M	7	2-3/4		5	
				6.11		11.90
6	F	8	3		4-3/4	
7	F	8	1/2		3-1/2	
8	F	8	1-1/4		4-3/4	
9	F	8	2-1/4		5	
10	F	8	1-3/4		7-1/4	
				3.92		12.14
11	M	8	3-1/4		9-1/2	
12	M	8	2-1/2		4	
13	M	8	1-3/4		3	
				5.37		10.81
14	F	9	3		7	
15	F	9	3		3-1/4	
16	F	9	0		1/2	
17	F	9	3/4		3	
18	F	9	0		0	
				2.62		5.58
19	M	9	1-1/4		1	
20	M	9	1/2		4-1/2	
				1.88		5.04
21	F	10	2		4-1/2	
22	F	10	3		8-1/2	
23	F	10	2		3	
24	F	10	0		0	
25	F	10	0		1/2	
				2.6		5.69

COMPARISON IN HEIGHT AND WEIGHT INCREASE OF PUPILS IN SCHOOL E

TERMINATING EXPERIMENT, MAY, 1954 (continued)

Sample	Sex	Age in Years	Height Increase (Inches)	Average Per Cent Increase	Weight Increase (Pounds)	Average Per Cent Increase
26	M	10	2		2-3/4	
27	M	10	3/4		2-1/2	
28	M	10	0		1-1/2	
29	M	10	4-1/4		4-1/2	
				3.26		4.53
30	F	11	2		0	
31	F	11	1/2		4	
32	F	11	1-3/4		5	
33	F	11	1/4		1-1/4	
34	F	11	2-1/2		9-1/2	
35	F	11	1		4	
				2.39		6.53
36	M	11	2		2	
37	M	11	0		1/2	
38	M	11	0		0	
39	M	11	0		0	
40	M	11	1-1/4		3	
41	M	11	3-1/2		8	
				2.08		3.58
42	F	12	1-3/4		5-1/2	
43	F	12	1		1-1/2	
44	F	12	0		1/4	
				1.68		9.66
45	M	12	2		12-3/4	
46	M	12	1-3/4		4-3/4	
				3.27		12.70
47	M	13	1-1/4		1/4	
48	M	13	2-1/2		6-3/4	
				3.15		4.85
49	M	14	1-1/4		2-1/4	
				2.12		2.09