

IMPROVING THE EATING HABITS  
OF THIRD AND FOURTH GRADE PUPILS

By

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Bachelor of Science

Oklahoma Agricultural and Mechanical College

Stillwater, Oklahoma

1945

Submitted to the Faculty of the Graduate School of  
the Oklahoma Agricultural and Mechanical College  
in Partial Fulfillment of the Requirements

for the Degree of

MASTER OF SCIENCE

1950

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## ACKNOWLEDGMENTS

The writer wishes to express her sincere appreciation for the valuable guidance, understanding and untiring efforts of her adviser, Miss Rowan E. Elliff, Associate Professor of Home Economics Education. To Dr. Millie V. Pearson, Head of Home Economics Education, the writer is indeed grateful for her counsel, cooperation and helpful assistance in carrying out this study. To Miss Mary E. Currier, Associate Professor of Household Science, the writer is deeply indebted for the knowledge received in her child nutrition class which helped her to recognize the need for a program concerned with improvement of food habits.

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## IMPROVING EATING HABITS OF CHILDREN

### Underlying Philosophy

Thinking people recognize that citizens of the United States are fortunate to be living in a democracy, where the individual has inherent worth and human life has great value and dignity. Education in a democracy should be for the benefit of all, with no restrictions as to color, race, age, sex, financial or social status. Teachers should be well grounded in all aspects of living that make society democratic in order to educate for democratic living. They must recognize that democracy is a way of life and that it is their responsibility to guide the development of children and young people in such a way that it will continue to be the way of life in this country. According to the report of the Committee on the Function of Science in General Education,

The purpose of general education is to meet the needs of the individuals in the basic aspects of living in such a way as to promote the fullest possible realization of personal potentialities and the most effective participation in a democratic society.<sup>1</sup>

If this, then, is the purpose of general education, the educator must teach not only reading, writing, arithmetic, the sciences, and languages, but also right living and right eating to meet the needs of the individual.

In order to realize the fullest possible personal potentialities, the child must have good health, and in this age of refined foods, people may not get enough vitamins and minerals from the things they eat. Thus, poor health and poor nutrition result. Leaving the choice of foods to chance does not usually promote good health.

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<sup>1</sup> Report of the Committee on the Function of Science in General Education, p. 23.

If this point of view, then, is accepted, it is the duty of educators to improve the health of the individual through the teaching of nutrition in the public schools. Those who have studied child development closely are acutely aware of the need for organized effort in the schools directed toward the teaching of nutrition education in the first grade and continuing such teaching through the twelfth grade.

Without good health many children fail to benefit from the instruction given them in school. When a child is listless, sleepy, or is suffering from malnutrition, he cannot give full attention to instruction. Therefore, the money spent in teacher salaries is often wasted. In the words of Surgeon General Thomas Parran:

We are wasting our money trying to educate children with half-starved bodies. They cannot absorb teaching, they hold back classes, require extra time of teachers, and repeat grades. This is expensive stupidity, but its immediate cost to our educational system is as nothing compared to the ultimate cost to the Nation. Something like 9,000,000 school children are not getting a diet adequate for health and well-being. And malnutrition is our greatest producer of ill health. Like nearly fresh fish, a nearly adequate diet is not enough. A plan to feed these children properly would pay incalculable dividends.<sup>2</sup>

Educators who accept Dr. Parran's statement as true, will be able to look about them and realize that the 9,000,000 children he speaks of are not all in the slums of the large cities and the cotton-picking sections of the South, but that they can be found in almost any school of the Nation. Malnutrition is found not only in low income groups, but also in high income groups. Something can and must be done to stop this unfruitful expense of which Dr. Parran speaks. A child who is well-nourished, happy and healthy, will be able to profit more from education because his

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<sup>2</sup> Dr. Thomas Parran, Surgeon General of the United States Public Health Service, "Nutrition Education and the School Lunch Program," School Life, XXVI (1941), p. 13.

mind will be keen and alert, while the under- or malnourished child will do more sluggish thinking.

Today, with the great scientific developments of this age, the health of the individual has lagged far behind. It is very important that the people of a democracy be healthy, for hungry people do not always think and act democratically. People have been known to sell their birthright for a mess of pottage. Today's educators must educate for democracy. Such education will not be adequate unless health and nutrition education are included. In the words of Manya Mannes:

Children hold the future of the world in their hands. If they grow up undernourished, they will fall easy prey not only to disease, but also to the forces which are doing battle with democracy. If they go hungry today, we will reap their anger tomorrow....This is the Challenge for American Patriots....<sup>3</sup>

Many administrators and teachers agree that nutrition education should be included not only in all the grades of the school, but should also be integrated with all subjects taught. It is the challenge to home economists and nutritionists to develop interest in nutrition education in the communities where they work. Todhunter concludes that:

Home Economics developed as part of our educational system because of the change in our economic life and accompanying change in the social structure. Today, we face another period of crisis in our civilization....in a world of science, we need better health through better food and nutrition.<sup>4</sup>

Accordingly, then, it behooves educators to put forth their best effort to give nutrition instruction to every child in every school in our nation, in order that the above-mentioned crisis in our civilization may be met,

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<sup>3</sup> Manya Mannes, "Food Wasted is Food for War," House and Gardens, (January, 1948), p. 25.

<sup>4</sup> E. Neige Todhunter, "Higher Education Challenges Home Economics," Journal of Home Economics, Vol. 41, No. 6 (June, 1949), p. 299.



and that the development of health and nutrition of the people of the nation may be more in keeping with the development of science.

If it is agreed that the health and happiness of the child is determined in a large part by the food he eats, it is apparent that plans must be made to educate to prevent as well as to cure ill health. When the child is taught good food habits at an early age he may be expected to be a more effective person and to develop his personal potentialities to a greater degree. When a child reaches high school his habits are more or less fixed and are difficult to change. Regular homemaking classes in junior and senior high school, then, cannot be expected to meet all the needs for health education, for they reach the child too late in life to be of most benefit. The health and happiness of the children, who will be our citizens of tomorrow, depends upon whether or not teachers and children have as their goal the optimum development of the child's body, as well as his mind, for the two go hand in hand.

It is fortunate that thought is being given to and that effort is being made toward the goal that the children in our democracy be provided equal health opportunities. In order to further this ideal the Government has provided means so that any school wishing to do so may have a school lunch program. This program has indeed been a great help for many school children. In a recent publication of the Federal Security Agency one finds the following statement:

Hot lunches served to pupils at school improve not only the physical fitness of the children, but also the mental development which aids in grade progress. Therefore, any well-planned project for health and nutrition should claim the attention of parents, teachers, civic leaders, and all agencies concerned with the well-being of children. Good health means better thinking, better emotional balance, better feelings, more courage and faith for the individual. An individual who eats adequate meals is in a better condition to help himself, other members of the family



and the community. Individual improvements will, in turn, help bring about better social, physical and moral living conditions for the homes of the community and state.<sup>5</sup>

This explains the present program in which the schools cooperate fully with the Government in providing a nutritionally adequate lunch for the children.

It should help the child develop eating habits for the whole day. Lydia

Roberts writes:

The schools can do much to help the parents effect desired change to a better dietary. It can teach the children the facts about the necessary foods and can send them home with a changed attitude and a desire and willingness to eat them. It can teach the place and limitations of sweets in the diet and lead the children to formulate a policy for themselves as to their legitimate use. It can see that an adequate noon meal is provided for the children who must stay at the noon hour and it can use this opportunity to educate the children in right habits of eating. It can see that overindulgence in sweets and other one-sided foods is removed, at least as far as the school premises are concerned. Too, it can work with the parents as well as with children in helping to make conditions in the home, the school and the community as conducive as possible to the development of wholesome habits of eating. It can start a movement for eating fruits, nuts and other foods in the place of sweets and perhaps, develop a habit that will persist after he is grown.<sup>6</sup>

Soft drinks, candy, and gum machines are often seen in schools. They are a constant temptation for the child to spend the money given him to buy a well-balanced lunch for a single kind of food, thereby contributing to his own ill health. The habit of eating fruits, nuts and other nutritious foods in the place of sweets will help to insure that the child gets the vitamins and minerals that are not available in sweets.

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<sup>5</sup> School Lunch Management, "Nutrition Education Series," Pamphlet No. 3, p. 11. Washington, D. C.: Federal Security Agency, U. S. Office of Education.

<sup>6</sup> Lydia Roberts, "Off to a Good Start with Proper Food," Nations Schools, 29 (June, 1942), p. 35.

One might say: "Look at our forefathers. They never heard of nutrition and good eating habits. Yet some of them lived to a ripe old age. Aren't we stressing food habits too much?" Or another might remark, "So long as we eat plenty of food, we will be all right." One must remember that in the days of our forefathers the foods were not highly refined, but were natural foods, and since much of it was not so highly refined, they were automatically provided with many of the necessary vitamins and minerals. Today, as a rule, people are not as active as our forefathers were, so the intake of food is naturally reduced. When, unfortunately, about 66 per cent<sup>7</sup> of the foods consumed are highly refined, it is to be expected that the vitamin and mineral content would be very low. People will, as a whole, probably never become as active as their forefathers. Although nutritionists stress the eating of natural foods, food companies continue refining them. Some companies return some of the minerals and vitamins into the foods after they are refined, but the end product is not always as good for one as the natural product. In many instances, only one of a number of vitamins removed is returned, and the mineral returned is not in a form which can be utilized by the body. Davis emphasizes:

If left to chance, the choice of foods, therefore, can rarely produce health. The majority of people do leave their choice of foods to chance and, as a result, they are below par both physically and mentally. They lack vitality, resistance to disease, and efficiency.<sup>8</sup>

It is very important, that the people receive instruction in eating food for health. The homemaking teacher alone cannot do this gigantic task, but every instructor in every school of our nation should integrate

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<sup>7</sup> Adelle Davis, Vitality Through Planned Nutrition, p. 2.

<sup>8</sup> Ibid., p. 2.

the teaching of food habits in all classes. The viewpoint of one educator, Homer W. Anderson, is of interest in this endeavor:

By incorporating nutrition education into the elementary curriculum, it becomes an integral part of education in health, social studies, science, reading, and other courses. As such, it strengthens the curriculum rather than amplifying it. There are few communities that would not benefit from the inclusion of nutrition education into the curriculum of the schools. An unusual opportunity exists to use the classroom as a laboratory for improved habits relating to eating and to food.<sup>9</sup>

When nutrition education is integrated and incorporated into the elementary curriculum, it becomes a functional and a vital contribution to the school, community and country. In working to improve the diets of children, the school will in many instances indirectly improve those of adults in the community. Thus, the school and community will be united in a cooperative effort to improve the health of people through improving their eating habits. Since eating is a complex process and most of the activities related to it are performed in the home, it is necessary for the parent and teacher to work together to improve the nutrition of the children. Such a program is necessary to help build a stronger nation.

The writer, a trained home economist, now teaching the third and fourth grades in the public schools of Tiawah, Oklahoma, firmly believes that teachers in the elementary schools can make a worthwhile contribution to the health and well-being of children by teaching good eating habits in the grades. Teaching the children good eating habits during their formative years is much better than breaking bad habits during high-school years. This point of view is not unique. One group of nutritionists made the statement that:

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<sup>9</sup> Elizabeth A. Lockwood, Activities in Nutrition Education for Kindergarten through Sixth Grade, p. 7. New York 17, New York: The Nutrition Foundation, Inc., 1948.



Although knowledge about nutrition does not of itself guarantee the practice of good habits of eating, educative experiences with food have led to substantial improvement in diet. Because such experiences have special appeal for very young children, the teacher's task is somewhat easier in the primary grades. It is less difficult to establish good habits in small children than to correct bad habits in older children. At the lower levels of instruction, moreover, parents are likely to feel a particularly strong interest in daily classroom activities and they will be most amenable to following suggestions that have to do with the health and well-being of their children.<sup>10</sup>

### The Immediate Problem

This study is based upon the belief that nutrition is an important factor in the health of our nation, and that it is the duty of teachers to study nutrition and to teach it to their pupils as a part of the curriculum in every grade in the school. Since many diseases are the results of poor nutrition, an elementary nutrition education program would help eradicate them, just as the schools have helped in overcoming illiteracy.

With these ideas in mind, it was believed that one might begin teaching nutrition in the third and fourth grades in those schools where it has not been started earlier. Children in these grades have both good and bad health habits but they are still young enough that learning to correct bad habits is not difficult. In many instances good habits have been established during the child's pre-school years. Likewise, many bad eating habits learned during these years need to be overcome. Nutrition education should be started at home during the early part of the child's life. In this case, the school can continue such teaching. This study is an effort to show what one teacher did to help third and fourth grade pupils form good eating habits.

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<sup>10</sup> The Teacher's Guidebook for a Program in Nutrition Education, p. 8. Minneapolis, Minn., (1946), General Mills, Inc.

In order to realize the value of the program, the reader must know something of the environment of the children. Tiawah, where the project was carried on, is a small village of approximately one hundred people, located on a main highway in the Dog Creek Hills in northeastern Oklahoma, about five miles southeast of Claremore. The community consists of the village and outlying farms and ranches, and covers an area of approximately four square miles. The village is flanked on the north, east and west by high hills where the trees turn beautiful colors in autumn. Interspersed among the hills are small diversified farms, and to the south are larger farms and ranches where beef and dairy cattle graze on the rolling plains and where wheat and other crops grow abundantly. The people in the village raise gardens and depend upon employment in Tulsa and Claremore, and in the returns from outlying farms for their incomes. Most of the homes in the community have electricity; some have running water. A variety of fuels are used, including coal, wood, propane, butane, kerosene and electricity. The majority of the homes have telephones. There are two churches in the community and an additional Sunday School is held in the school house.

Tiawah School, with an enrollment of 85 pupils, provides for the first eight grades and employs four teachers. It has better than average teaching facilities, because the rooms which formerly housed a four year high school provide more space for school and community activities than is usually found in rural grade schools. A room formerly used for high school classes is now a school lunch room. The Tiawah Home Demonstration Club uses one room. Still another room, having water facilities and a concrete floor, is used to good advantage for making ceramics. The pottery which the children make from native clay is fired by the Ceramics Department of

the University of Tulsa. A fourth room is used for the storage of janitorial supplies. The high school study hall and library room is used as a combination library, music and Sunday School room. A piano teacher gives private lessons two days each week. During the other three days the children take turns practicing playing the piano. The large auditorium is used for school programs as well as for community meetings and basketball games. There are fifty members in the 4-H Club, (one of the top ranking clubs in the county). A bus carries part of the high school children to Inola High School, six miles southeast of Tiawah. The remainder go by car to Claremore High School. The grade children usually walk to and from school.

During the first month of her service in the school, the teacher observed that the children showed many signs of malnutrition, such as low vitality, lack of energy, fatigue, listlessness and upset stomachs. Headaches, eye strain and toothaches occurred almost daily among the children. She became concerned as to what she could do to improve the situation. As she had suspected, she found that many of the children did not eat adequate breakfasts, and that some of them ate no breakfasts at all, so she decided to check their food habits. Through conferences and visits with parents and students, it was learned that a majority of the children left home each morning without eating breakfast. Thus, they were hungry until lunch time, and consequently were unable to concentrate on their school work. Nutritional authorities agree that:

To skip breakfast is to endanger both one's good temper and one's health. If one starts the day's activities with little food in his stomach, he is quite likely to experience fatigue, irritability, and restlessness about the middle of the morning. In addition, he risks cheating the body of the foods it needs for proper functioning.<sup>11</sup>

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<sup>11</sup> Ibid., p. 31.



Further information from the parents and pupils revealed the following reasons for not eating breakfasts: not waking early enough to eat and then reach school on time; not hungry; nothing they liked for breakfast; and illness.

### Criteria for Observing Progress

It was assumed that children need to learn to eat not only foods suitable for breakfast, but also the healthful foods provided in the school lunch, as well as a nourishing evening meal. Thus, it was assumed that they should be taught to eat the foods that provide better nutrition. Therefore, an attempt was made to find to what extent the third and fourth grade pupils ate a diet that provided for the inclusion of the seven basic types of foods which the body requires daily for nutritional well being.

"The Basic Seven,"<sup>12</sup> and the "Yardstick of Good Nutrition,"<sup>13</sup> classify foods into seven groups. Nutritionists have found that daily consumption of food from each group is necessary for good nutrition. The history of the Yardstick of Good Nutrition reveals that:

In 1941 the Food and Nutrition Board of the National Research Council developed what is often called a "Yardstick of Good Nutrition." This yardstick consists of tables of recommended daily allowances of specific nutrients--protein, calcium, iron, vitamin A, riboflavin, and so on--for men and women according to degree of activity, and for boys and girls according to age. For many years, enough has been known about the composition of foods to group them according to their most important contributions to body needs. By planning to include some foods from each group in our daily meals, it is comparatively easy to make up the allowances of specific nutrients recommended in the tables of the Food and Nutrition Board.<sup>14</sup>

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<sup>12</sup> Ibid., p. 21.

<sup>13</sup> Health Bulletin for Teachers, Vol. XIX (1947-1948), pp. 13. Metropolitan Life Insurance Company, New York, New York.

<sup>14</sup> Ibid., p. 13.

Some nutritionists group the basic foods needed in a chart known as "The Wheel of Good Eating."<sup>15</sup> It was recognized that some simple, graphic means of organizing the facts needed for understanding the fundamentals of good nutrition must be used as the basis for the project. Since "The Basic Seven" grouping is a simplified form and readily understood by younger children, the teacher and pupils decided to use that terminology. The term "Basic Seven" includes the following groups of foods:

1. Green and yellow vegetables--some raw, some cooked, canned or frozen.
2. Oranges, tomatoes, grapefruit, raw cabbage, or salad greens.
3. Potatoes and other vegetables and fruits--raw, dried, cooked, frozen, or canned.
4. Milk and milk products--fluid, evaporated, dried or cheese.
5. Meat, poultry, fish or eggs--or, dried beans, peas, nuts, or peanut butter.
6. Bread, flour and cereals--natural whole grains or enriched or restored.
7. Butter and fortified margarine (with added vitamin A).<sup>16</sup>

Information relative to the child's eating habits was secured through conferences and visits with the parents and children, and through observation. Some idea of family food patterns was discovered and more was learned of the child's nutritional status. The majority of the diets evaluated proved to be low in vegetables, fruits and milk. Upon observing the children during the lunch period, it was found that a large amount of food was wasted because they did not like certain foods; because their plates were

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<sup>15</sup> Our Daily Food, p. 7. Chicago, Ill., (1948), American Institute of Baking.

<sup>16</sup> Martha McPheters and Ruth Peterman, Eat Wisely--Protect Health--Conserve Food, p. 3. Extension Service Circular No. 471. Stillwater, Oklahoma: Oklahoma A. & M. College.

too full; because they were not hungry (after eating candy and drinking soft drinks); or because they felt ill.

The teacher wanted to get a picture of the physical development of the group to help guide her in checking their needs. She realized that while weight is not the only criterion by which health may be judged it may be an indication for determining the status of an individual's nutrition. Therefore, she weighed and measured the third and fourth grade pupils to ascertain to what extent they deviated from accepted standards. Of the twenty-two children, eleven were underweight, ranging from two to fifteen pounds, according to the height-weight chart.<sup>17</sup> Five of the children were overweight, ranging from three to thirteen pounds. The weights of the remaining six children were normal.

A check for dental caries revealed an astonishing number of cavities. There was not one child whose teeth were free from decay.

Each child kept a record of the foods he ate for three weeks. Each day he checked his record with the Basic Seven to determine if he were eating foods from each group. The majority of the diets were poor, lacking in fruits and vegetables, while some of the diets included very little meat, eggs and milk.

#### Integrating Nutrition Throughout The Program

One child remarked, "What good does it do us to know what we should eat, if we do not have the money to buy it?" This child had no milk to drink, except one glass for lunch. In order to give immediate help the teacher started bringing two quarts of milk to school daily for this child

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<sup>17</sup> Helen Monsch and Marguerite K. Harper, Feeding Babies and Their Families, pp. 370-371. New York: John Wiley and Sons, Inc., 1943.



and others who had no milk at home. After about three months this was no longer necessary for the parents had become aware of the values to be gained by having milk in the diet and provided it for their families. Some bought cows and others purchased milk from their neighbors or a local dairy.

Soon, only one child in the third and fourth grades disliked drinking milk. The classes grew interested in finding how Mary could include milk in her diet without drinking it. Food parties were held during the regular health period and during the first and last recesses. These parties were of two-fold importance. First, they helped Mary, as well as the other children, learn how to include milk in the diet in a variety of ways, and secondly, they kept the children busy during recess, when they would usually be running to buy soft drinks and candy, giving them something helpful and nutritious to substitute. Care was taken to give everyone a job at the parties. They seemed to take more interest in eating the foods which they helped to prepare. The children prepared different milk-fruit drinks, including banana milk, tomato milk, and apricot milk. They prepared cottage cheese and egg nog.

The mothers were asked to cooperate in the food habits improvement program. The majority of them were cooperative and pledged their support, especially to help the children get up early enough to eat breakfast. Those mothers who did not at first appear to support the program, soon became interested in improving the food habits of the children.

One mother would not permit her child to eat in the lunchroom, and the teacher wished to secure her cooperation in the program for better nutrition. She recalled the educational principle she had once learned, "start where there is interest." Through a casual conversation with

another teacher, the teacher of the third and fourth grades learned that this mother made delicious ice cream. The teacher decided that this might be a means of interesting the mother in the program. Because of the mother's indifference to and lack of cooperation with the nutrition program, the teacher had hesitated to contact her for help with this part of the school work but decided to telephone to ask if she would demonstrate the making of her famous ice cream to the children and help with a class party. The teacher explained Mary's problem of including milk in her diet and asked the mother if she would help the children in this particular phase of the program. The mother, feeling complimented, immediately accepted the invitation. She insisted that she be allowed to furnish the ingredients to make two one-gallon freezers full of ice cream. While demonstrating how to make the ice cream, the mother talked to the children about the reasons milk and eggs are needed in the diet, showing that she knew some of the fundamentals of nutrition. The children told her about their study of good eating habits and how they were trying to improve. They helped her chip the ice and turn the hand freezers, after which they had an ice cream party. Through participating in this manner, the mother learned how beneficial such a program was to the children and accepted her responsibility as a cooperating mother. Thereafter she permitted her child to eat in the school lunchroom.

Nutrition education was integrated in all the third and fourth grade classes. Readers and library books, dealing with foods, nutrition, good eating habits and health, were ordered from various commercial, governmental and educational sources, for use in supplementing the reading program. The children thoroughly enjoyed the books with interesting pictures and valuable information about improving food habits. They benefited also

from the new words learned. Some of the books supplemented their geography, science and social science lessons.

Charts and pictures were obtained which showed the effects of good and poor diets on rats, guinea pigs, pigs and chickens. Numerous posters were used to demonstrate or illustrate the effects of good and of inadequate nutrition.

Basic Seven charts were mounted on heavy paper, and each food group was cut out separately. These were used in showing the types of foods that are necessary for health. At one time the form used was the "Wheel of Good Eating," showing a circle or "wheel" divided into seven parts, each part representing a food group. Other Basic Seven charts were printed in the form of the letter seven, with three blocks forming the top of the seven and four blocks forming the downward stroke of the number seven, each block representing one of the basic food groups. When these blocks were cut apart, the children put them together in the correct order. They were called the "Basic Seven jig-saw-puzzles." Games were played, to determine who could most quickly put his puzzle together. Basic Seven food charts were given each child to take home to his mother. Most of the children reported that the mothers tacked the charts inside the cabinet doors to use as guides in planning and preparing the daily meals for the family.

Food models (colored pictures of foods on heavy paper) were obtained and used in planning menus which included the Basic Seven food groups. They were used in discussing and evaluating the daily school lunch to determine how many of the Basic Seven foods were used in the menu. Two fourth grade pupils used the food models to demonstrate Basic Seven foods in a 4-H Club meeting. A flannel board made by covering a board with

flannel, was prepared by the group. Small pieces of flannel were glued to the backs of the food models. As the models were used, they were placed on the flannel board; the flannel on the backs of the models adhered to the flannel on the board. No pins or thumb tacks were necessary. The models could be placed on the board and removed as if by "magic."

In order to depict the dietary and health habits of imaginary children in this community, the third and fourth grade pupils wrote a booklet about "Geary and Raylene." This project incorporated art, English, health, writing, reading, spelling, and geography into a single activity. The booklets were illustrated with free hand drawings. Other booklets were made about breakfasts, lunches, milk, wheat, citrus fruits, vegetables and fruits.

The children had a grocery store, which was another means of constantly keeping the Basic Seven before them. Each child brought empty food cartons and cans from home. These had been carefully opened on the bottom side and closed again so that it was not evident that they had been opened. Models of fresh fruits and vegetables were made from paper mache. This "grocery store" activity was integrated into the arithmetic, English, health and geography lessons. The teacher supplied each child with small change, with which to buy groceries. Buying groceries gave them skill in making change, and also in addition and subtraction. They were encouraged to buy foods from each of the seven food groups. After the groceries were paid for, the children checked them to find which of the Basic Seven food groups were represented in their selections. This gave much actual practice in selecting foods. The children learned and practiced the common courtesies and manners which should be used in the grocery store. They also studied where different foods are raised, thus integrating geography into the activity.



The pupils presented a nutrition play, "Old Mother Hubbard's Cupboard,"<sup>18</sup> at the assembly program in September. Mother Goose and her children filled Old Mother Hubbard's cupboard with foods from each of the Basic Seven food groups. When presenting the food, each child explained why the body needs that particular food. Actual foods were used in the play. A large number of parents were present. After presenting the play, the children asked to take the food home with them and it was divided among them.

In order to further emphasize the Basic Seven, the teacher sketched "thin-men" cartoons illustrating the effects of good and poor eating upon the body. The children enjoyed these sketches with the rhymes explaining them.

#### How Children Learned to Eat

As a means of helping the children learn to share responsibilities in the nutrition program, numerous vegetable salad parties were given, where each child helped do some particular task. They learned to combine vegetables to make different kinds of salads. Vegetable sandwiches were also prepared and eaten. In a number of cases, children who would not eat salads in the lunchroom, ate those which they helped to prepare, and decided that they liked salads. Care was taken by the teacher to select only the freshest of vegetables for these parties.

The importance of curiosity as a stimulus to learning was demonstrated when the children decided to try to taste disliked foods served in the lunchroom, in order that they might learn to like more foods. This taste-

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<sup>18</sup> Louise Wright, "Mother Hubbard's Cupboard," The Instructor, Vol. LVIII (September, 1949), pp. 39 and 83.

testing campaign proved quite valuable in a number of instances. The majority of children learned to like whole wheat bread through this activity. Others learned to like peas and green beans by tasting them when served. One boy learned to tolerate oleomargarine. Another learned to like liver. The influence of example was used to motivate learning in some cases when a new food was served. Those, who tasted the new food and commented on its delicious taste, were soon followed by others who thought that if Mary liked the new food they would also.

The teacher tried to use the element of novelty whenever possible in carrying out the nutrition program. This challenged thought, stimulated the children's interest, and usually resulted in renewed effort. In keeping the Basic Seven constantly before the group, each activity was planned to be different in terminology, arrangement, and bearing, so that it would, in effect, be a new activity. Thus, the children never lost interest or became bored.

During the winter months, when it was so tempting for the children to sleep late, a renewed effort was made to help them continue to eat good breakfasts. Two leaders were selected who chose members for their "breakfast teams." The members of the teams kept breakfast score cards for a period of three weeks. Breakfast club pins were worn by the members. The team with the highest score was entertained with a breakfast by the losing team.

The breakfast contest stimulated interest in the study of breakfast foods. The teacher provided as many different breakfast foods as possible for the children to taste. Larry, whose father raises wheat, provided a bushel of wheat, part of which was ground for whole wheat flour, part for cereal and the remainder used for whole grain cereal. The children cooked

the cereal on a hot plate at school. Tommy, whose father has a dairy, brought whole milk to be used on the cereal. Roberta brought honey with which to sweeten it. Experiments were made with brown sugar and white sugar as well as the honey to determine which sweetening they liked best with their cereals. Part of the ground cereal was roasted in an oven and served as the Mexican dish, penole. The children were quite fond of that dish. Comparison was made between the ground wheat cereals purchased at the store and the cooked cereal made from Larry's wheat. They found that although it takes longer to cook the latter, it is much cheaper. This provided an arithmetic problem. The children found that it cost nine times as much to use the packaged ground cereal as the home ground whole wheat. The whole grain wheat was cooked in a pressure cooker. Although the children liked it, they liked the penole best and the cooked ground wheat next best. Whole wheat bread was baked by the children in the lunchroom oven. Bread was made from whole wheat, graham, and white flour and comparisons made as to flavor, texture and cost with that made from Larry's flour. Biscuits, yeast bread, rolls, muffins, pancakes and waffles were baked by the children with the help of several mothers. They found that the texture of the products was not quite so good when made with Larry's flour, but that the flavor was delicious and the cost was less than half that of purchased flour. They consulted nutrition charts and found that whole wheat flour has more nutritive value than white flour.

White and brown rice were cooked and comparisons made as to flavor, vitamin and mineral content. Quick-cook, regular crushed and rolled oats were cooked and compared. Yellow and white corn meal was used to make mush for cereal. Corn was supplied by Bobby, a fourth grade pupil, who helped his father raise it. It was taken to the mill and ground into meal



to use in making mush and bread. Corn meal griddle cakes, muffins and bread were made with Bobby's meal, and also with purchased white and yellow meal. Comparisons were made as to taste and cost.

Throughout this unit the children were continually surprised to learn that home grown grains could be used in place of "store bought" products, and that the saving in terms of money was so great. They were surprised, too, that oatmeal, mush, cooked wheat and rice were classed as cereals. This was probably due to the fact that the majority of them had eaten only packaged, prepared cereals at home, giving them the idea that they are the only kinds of cereals.

Interest became so great that the children wanted to find out about the history of the different cereals. Their study resulted in several skits being written and enacted by the children.

Instead of eating special meals in the lunchroom, the third and fourth grade pupils set up tables in their class room and had "family" dinners. The children enjoyed celebrating days such as Thanksgiving, Christmas, other holidays and birthdays in this manner. On the day they celebrated Thanksgiving they had a special guest who ate with them. The teacher's college adviser visited school and remained to partake of their holiday feast with them. Before the meal was served, the children reviewed for her some of the things they were doing in order to improve their eating habits. The adviser then talked with them about their nutrition program and also helped them review the charts showing the effects of good and poor diets on rats and guinea pigs. Several mothers came in while she was talking. They were usually invited to eat in the school lunchroom on special days, so they often came early and visited classes before lunch.

Each child had a special task in preparing for the lunch. The tables were prepared and set. A large paper horn of plenty was used as the centerpiece, with nuts and fruits spilling from it. Chairs were brought in from the primary room and placed around the table. Everyone lined up and went into the lunchroom where they washed their hands and had their plates filled. Then they came back to their room and sat down at their tables. English walnuts, with names of the children printed on them, were used as place cards. When all were seated the adviser was asked to return thanks to God for the food. During the meal the children enjoyed talking to the adviser, just as they would any guest who came to their home and stayed for dinner. After the meal, the children insisted that the adviser take some nuts and fruit with her. After she had gone the children remarked about how much they enjoyed her visit. They said that she was "just like an aunt." Entertaining a guest had been so much fun for them.

Before Christmas the children made Christmas cards to send to friends and relatives. This gave them the idea to make Christmas cards and send them to the teacher's adviser. Each child made a card and wrote a personal, unsupervised letter. They told her how much they had enjoyed her visit and that they hoped she would come again. They also told her about some of the experiences they had had in improving their food habits and about the new foods they had learned to eat. This activity incorporated art, writing, English and human relationships into one learning experience and served as a valuable summarizing and evaluating experience for all in this group.

The adviser, who was a very busy person, took time to answer each card personally. She wrote a letter in a Christmas card to each individual. This meant a lot to the children, to be corresponding with a



college teacher. The fact that she was concerned about whether they ate what they needed served as an incentive for them to further improve their food habits. She was so impressed with the evidences of pupil growth and progress shown by the children's letters that she gave them to the teacher as further proof of the success of her teaching.

The personal relationships between the adviser and the children was capitalized in the community. This procedure of selling their interests beyond the community could be used effectively by all teachers.

#### Importance of Soil Conservation to Nutrition

While the children were in school one day, they noticed a truck spreading lime and phosphate on a nearby field. This introduced a very timely unit on soil erosion, soil conservation and soil building in the third and fourth grades.

Nutritionists and soil scientists agree that a Basic Seven diet cannot produce optimum health unless the soil on which that food is grown is fertile and contains all the minerals and elements needed by the human body. Food depends upon the soil for its content. The Basic Seven diet should keep a person completely supplied with all the elements of nutrition the body requires, if the various foods are products of a completely fertile soil. But, it is known that one pint of milk from one farm may be quite different from a pint of milk produced on another farm where different soil management is practiced or where different kinds of feed are fed to the cows. The same principle holds true concerning the production of eggs, meat, bread, vegetables, and fruit. The mineral content of the food is limited by the mineral contents of the soil.

Scientists are now ascribing the growing rate of degenerative diseases, such as those of the heart, liver, teeth, and bones largely to depleted

soils. The fact that there was a much higher percentage of military rejections during World War II than during World War I has led some to conclude that there is only one major disease--malnutrition. It is in the interest of the health of the nation that thought and action should be given to the restoration of one of our greatest national assets--the soil, since on the soil depends our personal and national health.

One might ask, "How can our soils be depleted? And if they are, what caused the depletion?" When the white man came to America, the virgin soils were not all alike, but most of them probably contained adequate quantities of most of the minerals needed by the body to maintain good health. These soils were made up largely of small bits of rock and decayed plant and animal life. Some of the minerals came from the rocks from which the soils were formed. Many of the minerals are known to have come from the sea, which contains at least 32 different elements.<sup>19</sup> Parts of America were once covered by the sea. Some of the minerals were deposited by birds and animals which fed upon fish and shellfish from the sea. They ranged inland and often died there. Their bodies, rich in the minerals and elements of the sea, became a part of the soil. Some authorities believe that ancient dust storms carried the mineral-rich sand and dust from the seashore to the interior, and from one section to another. Whatever the cause, history tells us that America was a fertile land when white man set foot upon its soil. But, from that day in history to this, the story of America has been one of destruction and waste. Someone has said that there were once so many trees in America that a squirrel could travel from the Atlantic to the Pacific without touching ground. The

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<sup>19</sup> Arnold P. Yerkes, Soil--A Foundation of Health, p. 8. Chicago, Illinois: International Harvester Company, 1946.

white man felled trees to plant his corn. When that plot of ground became depleted by the washing away of the top soil, he cleared another plot. The Westward Movement was hastened by the continual soil erosion of the land in the original thirteen colonies. George Washington's diary repeatedly refers to the depletion of the soil and to the many attempts he made to improve the soil on his plantation. Daniel Boone, as a member of the Westward Movement, found Kentucky to be a hunter's paradise--another Garden of Eden. Today, much of the soil in Kentucky is depleted. The white man felled the trees to plant his crops. The top soil washed away, and he had to move on to greener pastures. Today, there are no more greener pastures to exploit. There are no more land frontiers.

Soil erosion was not the only means by which our soil was depleted. Leaching took its toll of valuable life-giving elements in many areas of heavy rainfall. In this process, the water-soluble elements were carried down through the subsoil, on to the subterranean water level, and thence out of reach of the roots of plants.

Another method of soil depletion has been the continual shipping of crops and animals to the cities. With them went the minerals from the land. Of course, one year's produce could not make any appreciable difference in the soil fertility, but in the one or two hundred years that some of our soils have been farmed, there has been an unusual amount of depletion of the elements. The minerals which were shipped to the cities in the form of produce never returned to the farms from which they came. Some of them landed in garbage dumps or ash heaps. Thus, it can be seen that the soil of America has been depleted of valuable health-giving elements. Therefore, it behooves the teachers of America to teach soil conservation and soil improvement to the children of America, for they are dependent upon it for the food they eat.



The teacher of the third and fourth grade pupils felt that because of the relationship of soil to nutrition, a soil conservation unit should be included in the program to help improve food habits. Numerous educators and nutritionists are also of the opinion that:

Because the quantity and quality of food available to the people of the world depend, to a large degree, on the condition of the soil in which the food is produced, a unit on soil conservation is basic to a well-rounded program in nutrition education. Young people become intensely interested as they see the need for applying what they learn in school to their own local situations.<sup>20</sup>

Since the Tiawah community is largely an agricultural one, it seemed that this would be a good place not only to learn about soil conservation, but also a place where the principles of soil conservation and soil building could be applied to local situations.

The teacher, whose family has for several years practiced soil conservation methods on the farm, had read widely on the subject. But, she decided to seek outside help to locate other sources of information not known to her. Conferences were arranged with the district soil conservationist, the county agent, and agriculture teachers. Bulletins, books and pamphlets as well as numerous charts and pictures were obtained from these sources. The agriculture teacher loaned film strips on soil conservation. The district fish and game warden showed the children a color sound film, which depicted the role of trees and forests in soil and water conservation. The teacher and children, as a part of their study, made additional charts, pictures, and maps to supplement these materials.

The Soil Conservation Service furnished data relative to the number of soil conservation cooperators in the district. A map of Tiawah district

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<sup>20</sup> The Teacher's Guidebook for a Program in Nutrition Education, p. 57. Minneapolis, Minn., (1946), General Mills, Inc.

was drawn, showing the areas on which some soil conservation measures were practiced. Some of these pastures and fields were observed by the children.

The children climbed to the top of a very high hill near Tiawah. From that height, the fields and pastures could be seen, as if viewed from an airplane. Contrasts in soil management were apparent in adjoining fields. One had been terraced, while across the fence in the neighboring field were to be seen gullies which were the results of severe erosion.

As a means of incorporating geography into the study and also to emphasize the seriousness of erosion, the teacher helped the children trace on the map the route the soil took as it left the field and went on its way to the Gulf of Mexico. On the map of Tiawah, they found that the soil from this eroding field entered the small stream that ran through the field. The soil muddied the stream and found its way into Panther Creek, which overflowed every time it rained. On into Dog Creek, and into the Verdigras River, it raced, where it was observed that part of it remained as silt on the bottomland farms; part of it helped to fill up the bed of the river making it more shallow, while the remainder followed the course of the river to the Arkansas. The soil then followed the Arkansas River on its way to the Mississippi River and thence into the Gulf of Mexico, part of it being deposited on lowland farms and in the river beds; along the way some of it helped to form the rich delta lands at the mouth of the river, and the rest of it flowed with the tide into the ocean. Pictures of the rivers were used to illustrate floods and silting of lowland farms. Pictures showing the delta lands and the cities built on these lands revealed to the children that it took a lot of soil to build these lands and that it had come from the fields and pastures all over the Mississippi River Basin, leaving them unfit for good farming. Thus, the children



could see that a great responsibility rested with the people of their community, to help stop soil erosion, to practice soil conservation measures and to help build back the depleted soil.

Other field trips were made to observe more soil erosion as well as soil conservation measures. The pupils observed that about half of the community practiced soil conservation, while the other half was indifferent.

The many causes of soil erosion were studied; among them the practice of burning pastures and meadows, overgrazing, plowing and planting to crops land which should be pastured, plowing up and down slopes instead of on the contour, and the failing to use crop rotation. Examples of these practices could be seen as the children observed the fields and pastures while on their field trips. As was to be expected, the children talked about soil conservation at home. They took books and pamphlets home for their parents to read. They discussed with their families some of the practices on their farms which led to soil erosion.

One topic which caused heated discussion was the practice of burning pastures and meadows. One old timer in the community remarked, while visiting school one day, that their meadow had been burned each spring for the last forty years, and as long as any of their family lived, it would continue to be burned each spring. Such was the sentiment of the majority of the people of the community. The children didn't know which side to believe. They were used to believing their elders, but they also respected the sources of information they had consulted. Since a number of the younger farmers were veterans of World War II, and were taking advantage of the Veterans' Agricultural Training Program, the teacher went to the authorities in that program for assistance. Some of the young farmers

enrolled in agriculture had either younger brothers or sisters or children of their own in the third and fourth grades. Thus, it was believed that the agriculture teachers could be of great help in the problem of preventing the burning of pastures and meadows in the community. The agriculture teachers cooperated by using soil conservation as the topic of conversation and study in their classes at that particular time. The fact must be recognized that the agriculture teachers had been largely instrumental in instituting a number of soil conservation measures already in use in the community and county; but some farmers, who practiced contour farming and terraced their hillsides, still practiced the burning of meadows and pastures.

One boy, whose brother-in-law was in the agriculture class, told the teacher and the class that he believed that it was best to burn pastures and meadows. He said it made the grass come out greener and the quality of hay was much better. He said that his father and brother-in-law, who farmed together, had already burned half of their pastures and meadows and planned to burn the remainder as soon as possible. A pasture near the school house had been burned. The teacher took the children to see it and showed them the unprotected soil and how the rain drops in the spring rains would take away much of the top soil before the grass could grow again. She explained how the old grass protected the top soil from the rain drops, allowing the water to soak into the soil slowly, reducing water run-off, thus conserving more water. Explanation was also made that the old grass eventually decayed, helping to form more top soil, thus producing more fertile soil. The children were taken to a pasture which had not been burned to see the protection the soil had from rain. The boy, referred to earlier, was silent, and the teacher did not press him to discuss the matter,

but let him think about it. No effort was made to make him feel that the demonstration was for his particular benefit, but that it was just another class activity in connection with the study of soil conservation. A few days later, this boy approached the teacher and told her that he believed she was right, that he could see now why pastures and meadows should not be burned. The agriculture teacher said that while visiting the farm later, he noticed that the remainder of the grass had not been burned. This example shows again the value to be gained from the cooperation of someone outside the community. The young farmers did not know that the teacher had asked the help of their own agriculture teacher, but the fact that he, an authority on the subject, taught the same things she did, helped them to believe her.

The children decided that the information they had gained should be made available to the parents. They gave a soil conservation program. A number of children gave talks on different phases of soil erosion and soil conservation. Demonstrations were given, showing how and why soil erodes and how it can be conserved. A skit was enacted showing the effects of erosion on history and geography. Pictures and charts were used to illustrate the effects. It was made plain to the audience, that if soil depletion in America is not halted, our country and its people may go the way of the country and the people in Northern Africa and Asia Minor. What was once thriving agricultural lands in these areas are now deserts where not a sprig of grass can be seen. One boy explained to the group why some of our great cities are suffering water shortages, showing that silt, washing down the streams fills up lakes and water reservoirs. It was also shown that the increased rate of run-off of rain water from the land prevents the storage of underground reservoirs of water. He explained that



the underground water level of the United States is becoming lower and lower, and that it must be raised before our country becomes a desert. Pictures and maps of our nation's capital were used to illustrate how soil erosion in that region caused the Potomac River to fill up, making the river narrow and shallow. When our country was young, ocean going vessels navigated the Potomac. Pictures of Lincoln's Memorial were displayed. It was explained that the place where it now stands was once a part of the Potomac River, but that silt filled in the river, so that the soil on which the memorial stands came from the watershed of the Potomac--soil that was intended to produce food for humanity. Although portraying a dark picture to the audience, they demonstrated the methods by which America can alleviate her problem. During the program the children sang a soil conservation song. The county agent, who had been invited to the program, demonstrated the use of the level in building terraces and running contour lines and in building diversion ditches, drainage ditches and ponds.

As a follow-up to the soil conservation unit, the children became interested in gardening. Since the soil of the garden produces the vegetables needed in the daily diet, most of the people of the community sent samples of their garden soils to the county agent's office to be tested for minerals. The majority of them showed depletion of one or more minerals. During the process of supplying minerals to the garden soil, some of the people decided to have the soils in their fields and pastures tested. So, it was observed, study and improvement in one area resulted in study and improvement of another area; thus the soil improvement program progressed in the community. Not only did the third and fourth grade pupils learn much about soil conservation, but the people of the community saw the need for applying what had been learned in school to their own local situations.

Since gardening is the project of almost every 4-H Club member, the club decided to plan one of their programs around gardening. Parents were invited to attend the meeting. Timely topics were given on how to improve soil fertility. Demonstrations were given on the use of compost in improving soil fertility and how to make compost. The use of leaf mold and rotted barnyard manure was also demonstrated. Members demonstrated how to plan the home vegetable garden, and the order in which vegetables should be planted in the garden. Testing vegetable seeds for germination was also demonstrated. The sand table from the primary room was borrowed to use in the demonstration of mulching vegetables to conserve moisture and to prevent the growth of weeds.

Parents in the community usually allow the children to have a section of the family garden to care for by themselves. Therefore, when gardening time arrived, the children became quite enthusiastic over the prospect of planting seeds and watching for them to sprout. Aside from applying minerals to their gardens, a number of the children applied leaf mold and rotted manure to improve the soil fertility.

Several 4-H Club members exhibited livestock, including pigs, lambs and steers, at the county 4-H and Future Farmers of America Livestock Show. The grand champion steer was exhibited by a member of the Tiawah 4-H Club. Each of the other exhibits from the club placed high. Thus, a good opportunity presented itself to compare the raising of healthy animals to the raising of healthy children. The club members told of the care of their animals--how they had fed them balanced rations and had exercised and groomed them for the show. The children could understand that if it was important to feed animals correctly to make them grow into big, strong and healthy creatures, it was even more important that they feed themselves a balanced diet so they would grow into healthy, happy men and women.



### Summary and Conclusions

Throughout this project no detailed scientific method was used to measure progress, either in changes in thinking or in physical growth made by the children. The method of collecting evidence was by observation and personal contact. However, certain definite and observable changes were made:

1. All of the children ate lunch in the school lunchroom before the project was completed. Prior to that time some of the parents did not permit their children to eat in the lunch room.

2. All of the children became concerned about getting the Basic Seven foods in their daily diets.

3. Children learned to like many foods which they had previously disliked.

4. Health experiences in all the third and fourth grade classes had enabled the teacher to better hold the interest of the students.

5. The children had a normal, natural curiosity about the effect of habits on health.

6. There was greater evidence of more sensible questions asked by the children after they had studied to improve their health.

7. The children showed greater interest in others.

8. Children showed signs of social changes in the way they worked together as a group. Cooperation was more noticeable among the group. They saw their relationship to outsiders. Certain ideas were put over to the community through the cooperation of club members.

9. The children could see the relationship of physical as well as social changes.

The results of the experience in teaching nutrition to children affected adults in the community:

1. They saw and understood what the school was trying to do.
2. They had many opportunities to work with the school and participated more frequently in school activities.
3. They developed increased respect for teaching.
4. They learned new things themselves and accepted them from small children.
5. Family eating patterns were changed as a result of the project.
6. The people of the community became interested in improving the soil. They sent samples to the county agent to be tested. They became interested in applying needed minerals and in planning the year's food supply.
7. By working with children, the parents learned to appreciate how children learn. They became more concerned about their needs and abilities.

Through this cooperative experience other governmental agencies became interested in the nutritional needs of the people of a community and helped in carrying out the project. They furnished invaluable written material and assistance.

#### Recommendations

1. Nutrition education should and can be incorporated in the school programs of all children.
2. Teachers should make an effort to enlist the cooperation of the parents and of the agencies in the community in the nutrition program.
3. Teachers should secure and use with discrimination the numerous kinds of teaching material available.

4. Teachers should use a wide variety of experiences to maintain the interest of the children.

5. Constant encouragement should be given to both the pupils and parents to maintain an adequate nutritional regime.

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A Guide to Good Eating, A Happy Day, Breakfast's Ready, Food and Care for Good Dental Health, Hello from Alaska, Hello South America, Hello, U. S. A., Ice Cream, Let's Find Out About It, It's Always Breakfast Time Somewhere, Is It True, Milk for You and Me, Milk, Our Food, Watch Them Grow, Milk Made the Difference, for sale by the National Dairy Council, 111 North Canal Street, Chicago 6, Illinois.

Andress, J. Mace, and Dickson, Julia E. Radio Bound for Banana Land. Educational Department, United Fruit Co., Pier 3, North River, New York, N. Y.

Busy Betty, Glen Can Walk, John Learns About Chickens, Health and Happiness Nursery Rhymes, John Raises Chickens, Kinds of Chickens, Lucky You, School Lunch at Lincoln Center, The Lucky Twins, Write It Right, for sale by the Bureau of School Service, University of Kentucky, Lexington, Kentucky.

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Good Cooks, Our Daily Food, What Did You Eat Today? free on request from the American Institute of Baking, 1135 West Fullerton Avenue, Chicago 14, Illinois.

Nutrition Charts--75 cents per set of 10, from Superintendent of Documents, Government Printing Office, Washington 25, D. C.



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