

FOODS AND NUTRITION UNIT TO MEET THE NEEDS OF 7TH
GRADE PUPILS AT RAYTOWN, MISSOURI

by 45

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INTRODUCTION TO THE STUDY

Nutrition is a process. It is the process by which the living organism receives and utilizes the materials necessary for the maintenance of its functions and for the growth and renewal of its components.¹ Nutrition education, therefore, by definition, must be a functional activity. The function becomes that of motivating individuals to want to provide their bodies with those substances, found in foods, which are needed for complete sustenance, and, of teaching the basic principles and skills necessary for making the activity effective.²

Teen-agers represent a segment of our population who exhibit the poorest eating habits. A recent survey of teenage boys and girls from the western regions of the United States disclosed that six out of ten girls and four out of ten boys were reported to have inadequate diets.³ Although our society boasts an affluence of foods and food products, there has been no evidence cited to indicate that the diet

¹Erce! Eppright, Mattie Pattison, and Helen Barbour, Teaching Nutrition (Ames, Iowa: The Iowa State University Press, 1964), p. 312.

²Ibid., p. 19.

³J. McElroy and B. Taylor, "Adolescents' Values in Selection of Food, Journal of Home Economics, 58: 651-54, Oct. 1966.

patterns of teen-agers have been improved. Kilander described today's adolescent as being "well fed but ill nourished."¹

A recent national survey revealed that as students advance in school the disparity widens between knowledge and the practice of good nutrition. It was stated by the author of the survey report that there is a real need for improvement in nutrition course content and methodology.²

A major problem for the nutrition educator is that of motivating teen-agers to want to improve their ability to select nutritionally-adequate diets. The difficulty lies in breaking down the various types of barriers which prevent fluent communication.³

There is a need for the nutrition educator to develop improved methods of communicating the principles, facts, and attitudes which contribute to the practice of good nutrition. Lee⁴ advocated involving the student in the planning and executing of activities as much as possible as a means of motivation, and, correlating nutrition

¹H. F. Kilander, "Adolescents - Fail on Food Facts," PTA Magazine, 59: 7, May, 1965.

²S. S. Steinberg, "Schools Are Teaching Nutrition, but They're Teaching It the Wrong Way," Nations' Schools, 77: 84-5, May, 1966.

³Ruth M. Leverton, "Basic Nutrition Concepts," Journal of Home Economics, 59: 346-48, May, 1967.

⁴Geraldine S. Lee, "Texas Community Tackles Teen-Age Food and Nutrition Problem," Journal of Home Economics, 55: 763-66, Dec. 1963.

learning activities with other aspects of the student's total educational experience. Other suggested activities included self-evaluation, science-related projects, and school or community surveys.

Statement of the problem

The purposes of this study were (1) to develop and administer to 7th grade homemaking students a foods and nutrition pre-test and a questionnaire on daily dietary intake, and (2) to use the information obtained from the pre-test and daily dietary records to develop a foods and nutrition resource unit. Emphasis has been placed upon developing student-centered activities and upon extending science-related experiences into the foods laboratory. The study has been limited to students at Raytown South Junior High School, Raytown, Missouri.

Procedures

Background for the study was obtained by a review of literature related to (1) nutrition education in the secondary school, (2) factors which affect learning and diet patterns of the young adolescent, and (3) basic concepts and techniques applicable to teaching nutrition in the junior high school.

A pre-test was developed and administered to all students enrolled in 7th grade homemaking at Raytown South

Junior High School, September, 1967. The subject content of the pre-test included:

- (1) caloric value of foods,
- (2) nutritional value of foods with emphasis on the importance of the six nutrients,
- (3) Basic Four Food Groups,
- (4) nutritional aspects of meal planning.

A questionnaire on daily food intake was developed and the completed form filled out by each girl in two 7th grade homemaking classes for three consecutive days.

The pre-tests and daily diet records were analyzed to determine the areas of learning which needed to be emphasized most in the development of the resource unit.

Implications for teaching have been developed from the findings of the review of literature, pre-tests, and daily diet records.

A resource unit on foods and nutrition entitled "Food Needs of the Body" has been developed in terms of objectives, generalizations, learning experiences, and teacher-student evaluations.

REVIEW OF LITERATURE

Background for the study was obtained by reviewing literature related to (1) nutrition education in the secondary school, (2) factors which affect learning and diet patterns of the young adolescent, and (3) basic concepts and techniques applicable to teaching nutrition in the junior high school.

Nutrition Education

Recognizing patterns of eating in relation to their effect upon the health and well-being of the individual provides a base line for approaching nutrition and the processes involved in nutrition education.¹ It has been stated that the aim of nutrition education should be to establish diet habits and attitudes that will result in the intelligent selection and consumption of nutritious foods throughout life.² Martin stated that "the hope for a better nourished people lies largely in helping children to develop good eating habits early and to maintain them throughout life."³

Tinsley reinforced Martin's opinion when she advocated

¹Ethel A. Martin, Nutrition in Action (New York: Holt, Rinehart, and Winston, 1965), p.3.

²H. F. Kilander, "Adolescents - Fail on Food Facts," PTA Magazine, 59: 7-8, May, 1965.

³Ethel A. Martin, Nutrition Education in Action (New York: Holt, Rinehart and Winston, 1966), p. iv.

that teaching youth about food and nutrition begins in the home during infancy and childhood with the establishing of good patterns of eating behavior. Then, for best results, the behavior patterns developed at home should coordinate with learning experiences encountered later in the school.¹

Nutrition education must do more than "skim the surface" if students are to develop a real interest in the subject and gain some confidence in its application. They must know the basic principles of nutrition and be given the tools necessary to discover for themselves how the principles can be applied.²

Nutrition education must involve teaching individuals to make good food selections and to maintain an environment conducive to the utilization of the nutrients provided by the food.³

Identification of a need for nutrition education at the secondary level. Teaching about foods and their effect upon the health and growth of the individual is a challenging problem in the secondary school. The problem for the educator lies in understanding the nutritional needs of the

¹Willa V. Tinsley, "As the Twig Is Bent," The Yearbook of Agriculture (Washington, D. C.: U. S. Government Printing Office, 1959), pp. 636-46.

²Ethel A. Martin, Nutrition in Action (New York: Holt, Rinehart, and Winston, 1965), p. 3.

³Ercel Eppright, Mattie Pattison, and Helen Barbour, Teaching Nutrition (Ames, Iowa: The Iowa State University Press, 1964), p. 18.

adolescent, in collecting and interpreting reliable information about food and food habits, and in helping the adolescent recognize the relationship between sound nutrition and optimum health. The challenge becomes evident as one realizes the importance of the task.¹ Leverton confirmed the importance of the task when she stated that "the fitness and vigor that can come through good food and good nutrition are never more important than during the teen years."²

Repeated studies of Iowa school children clearly indicated that their typical food habits were far from satisfactory, with intakes of certain nutrients short of the amounts recommended for good nutrition in children. The nutrients most often found to be below the recommendations were those furnished by the dark green and yellow vegetables and by milk and milk products. Also, their diets were lacking in the fruits and vegetables rich in vitamin C.

Other recent studies dealing with the dietary records of different groups of teen-agers indicated that their diets too were deficient in the same essential nutrients.⁴ The most neglected nutrients in these particular studies were

¹Pauline Sutter, "Goals for Teaching Nutrition," Practical Home Economics, 5: 36-47, Feb., 1960.

²Ruth M. Leverton, Food Becomes You (New York: Doubleday and Co., Inc., 1961), p. 27.

³Eppright, op. cit., p. 83.

⁴Mary C. Hampton, et. al., "Caloric and Nutrient Intakes of Teen-Agers," Journal of the American Dietetic Asso. 50: 385-96, May, 1967.

calcium and iron. Negro and lower socio-economic groups tended to have lower intakes of nutrients than some other groups.

There were other factors of interest identified from these studies. It was found that those who ate less frequently had poorer eating habits and that there was a tendency for obese boys and girls to skip meals. Also, those who were classified as overweight tended to eat less fruits and vegetables.

Kilander stated that "adolescents need to know more than they do about nutrition."¹ Furthermore, he recommended that nutrition education should begin at the elementary level, continue with a more extensive unit at the junior high level, and progress into a more advanced unit at the senior high level. He elaborated that by the high school level a unit in nutrition should:

- a. give knowledge of the relationship between nutrition and health.
- b. explain dangers of underweight and overweight.
- c. enable one to analyze diets in relation to food groups.
- d. enable students to recognize signs of good nutrition and malnutrition.
- e. provide an understanding of the laws needed to protect the consumer.
- f. understand the need for moderation in the drinking of tea, coffee, and soft drinks.

¹H. F. Kilander, "Adolescents - Fail on Food Facts," PTA Magazine, 59: 7-8, May, 1965.

Nutrition education and physical fitness. A recent report on the problem of teen-age obesity contended that inactivity and ignorance are more the cause of overweight than overeating. This report quotes Dr. Jean Mayer of Harvard University as saying that "what teen-agers really need is more specific information about food values and exercise - and someone to make them move!"¹

McElroy, on the other hand, reported that although there has been a good deal of concern of late with promoting physical fitness, the emphasis has been on activity, overlooking the nutritional aspect of physical fitness.²

Nutrition education and the school. Although the home has a primary influence in the development of the child's food habits, schools can play a distinctive role in the nutritional welfare of children. Schools have the opportunity to reach all of the children and give them continuous leadership throughout their school life. The approach used may be a positive or negative factor in helping to promote good food habits among children.³

¹Joanne Lopez, "Obesity A Problem?," Forecast for Home Economics, 13: 12-27, April, 1968.

²J. McElroy and B. Taylor, "Adolescents' Values in Selection of Food," Journal of Home Economics, 58: 651-4, Oct. 1966.

³Ethel A. Martin, Nutrition Education in Action (New York: Holt, Rinehart and Winston, 1966), p. 1.

In a recent report of a national survey of elementary and secondary students, Steinberg advocated that school administrators should take a more active role in improving present school nutrition programs. He further stated that in many cases pupils are being taught the same nutritional subject matter year after year without an orderly and continuous advancement. In the report, as a guide for administrators, he has outlined some positive steps toward promoting better programs for nutrition education in the schools. These steps would be:

- a. to require that teachers of nutrition be qualified.
- b. to provide trained co-ordinators and in-service training for teachers and staff.
- c. to develop local curriculum guides after a careful study of local eating patterns.
- d. to analyze every curriculum area in which nutrition is taught. Avoid repetition of learning experiences and omission of nutrition content in important grade levels.
- e. adaptation of methodology, teaching approaches and materials to specific grade levels.

Administrative support of the school nutrition program is essential if it is to affect the entire school situation. The administration must believe in nutrition education, encourage the use of the teacher's time in nutrition activities, and stand behind efforts to remove negative attitudes and influences from the school environment.¹

¹Martin, op. cit., p. 2.

The nutrition educator. The nutrition educator's task is twofold; first, to teach what is known, and, second, to continuously study and critically evaluate new information.¹ In addition, she is responsible for acquainting the public with the world food situation and with the meaning of malnutrition, especially semistarvation, which is perhaps the most prevalent form.

The home economics teacher must endeavor to motivate the teen-age girl to analyze her diet pattern and to take a critical look at her personal food habits in view of the effect they may have upon her present and future health and vitality. In interpreting information about nutrition, she must avoid the use of half-truths, oversimplifications, and promises that cannot be fulfilled.² The better prepared a teacher is in the subject of nutrition and in methods of teaching nutrition, the more competently she will carry out the responsibility with success.³

Factors Which Affect Learning and Diet Patterns of Young Adolescents

The paradox of less-than-optimal nutritional levels in a land of plenty and an age of affluence is one of major

¹Ercel Eppright, Mattie Pattison, and Helen Barbour, Teaching Nutrition (Ames Iowa: The Iowa State University Press, 1964), p. 9.

²Ibid., p. 12.

³Ethel A. Martin, Nutrition Education in Action (New York: Holt, Rinehart and Winston, 1966), p. 2.

concern for the nutrition educators and food scientists today.¹ There is a wide gap between nutritional knowledge and food practices which must be attributed to factors other than teaching-learning procedures. In Hampton's recent study dealing with the dietary intakes of teen-age groups, it was found that there was little relationship between ~~statements~~ made by the subjects on questionnaires and their ~~actual~~ eating practices. Also, it was noted that there was no relationship between school performance as measured by grade point and the quality of the diets analyzed.² Cultural patterns, habits, attitudes, values and individual physiology are among the factors which may have an affect upon individual and group learning and upon consequential diet patterns.

Cultural factors influencing food choices. Society today considers the young adolescent to be an active consumer. As a consumer, the teen-ager is confronted with multitudinous inducements to buy food and drink. Lantis reported that the child consumer is limited in his eating behavior due to the choices of foods made available to him

¹Hazel K. Stiebling, "How Far Have We Come?," Journal of Home Economics, 59: 341-45, May, 1967.

²Mary C. Hampton, et. al., "Calorie and Nutrient Intakes of Teen-Agers," Journal of the American Dietetic Asso., 50: 385-96, May, 1967.

by vending machines and merchandizers.¹ Since more and more meals are eaten piece meal style and away from home, this factor could easily have a detrimental effect upon the individual's diet pattern over a period of time. She further stated that emphasis should be placed upon the importance of teaching the child to choose between those foods that are best to eat and those which are good to eat, and to have them equally available and tempting.

Habits, attitudes and values. Habit is a powerful force in determining individual diet patterns. Eating habits gradually develop from infancy through childhood as the outcome of many types of experiences.² They are the result of multiple factors that operate both singly and together. Basic influences in food habit formation include: food supply; the economic welfare of the people; family eating practices; social customs; emotional climates; sensory reactions; and, educational influences.³

Stiebeling and Dreis described the development of food habits as the result of the interaction between the individual and his environment. They stated that attitudes and

¹M. Lantis, "The Child Consumer," Journal of Home Economics, 54: 370-75, May, 1962.

²Willa V. Tinsley, "As the Twig Is Bent," The Yearbook of Agriculture (Washington, D. C.: U. S. Government Printing Office, 1959), pp. 636-46.

³Ethel A. Martin, Nutrition in Action (New York: Holt, Rinehart, and Winston, 1965), pp. 4-5.

eating habits grow out of cultural, social, and economic backgrounds. Consequently, choices within major types of foods reflect both the individual's heritage and his response to his environment.¹

Food habits are good when one willingly eats the kinds and amounts of food that will enable him to maintain an optimum level of nutrition.² Scientists have established daily dietary allowances³ as a guide for individuals in maintaining a diet that is nutritionally satisfactory.

Habit modifications should be attempted only after one becomes aware of the background of a particular habit and a careful study indicates that the present diet under consideration is nutritionally inadequate.⁴

Attitudes about foods and eating patterns can determine to a great extent the teen-agers' eating performance. If they do not feel "emotionally" that food is precious, they can not readily understand or sense that any specific food or food element is vital to them.⁵

¹Hazel K. Stiebeling and Thelma A. Dreis, "Habit - and More," The Yearbook of Agriculture (Washington D. C.: U. S. Printing Office, 1959), p. 13.

³Recommended Daily Dietary Allowances are prepared by the Food and Nutrition Board of the National Academy of Sciences - National Research Council.

⁴Martin, op. cit., p. 16.

⁵Lantis, loc. cit.

A recent study pertaining to food likes and dislikes was conducted by nutritionists at Cornell University with girls living in dormitories. As a result of the study, it was found that the diets of most of the girls provided less than seventy percent of the recommended allowances for calcium, iron, and thiamine. In general, however, the inadequacy of their diets was not a direct result of distaste for certain foods. Failure to maintain diets as good as those recommended by the National Research Council seemed to result from indifference and misinformation about food values rather than dislikes. It was concluded that the special food likes and dislikes exhibited grew out of associations made with foods and eating. Parental example and advertising were among the more important influences found to affect their food choices.¹

Tinsley also stressed the importance of emotions in the development of attitudes about foods and eating behavior.² In addition, she stated that learning can be done only by the individual, not for him. Consequently, every opportunity to relate nutrition education to the individual should be encouraged.

¹Stiebeling and Dreis, op. cit., p. 631.

²Willa V. Tinsley, "As the Twig Is Bent," The Yearbook of Agriculture (Washington, D. C.: U. S. Government Printing Office, 1959), pp. 636-46.

Nutrition in the abstract has little appeal. It must be translated into specific benefits for the individual. The individual must be able to analyze his own food habits objectively, identify his own eating problems, recognize the origin of his prejudices, and face the advantages to himself of making the necessary dietary adjustments.¹

Physiological factors influencing eating behavior.

Taste is one of the more important factors in determining the acceptability of food. Sensitivity to the basic tastes of sweet, sour, bitter, and salty has been measured and it was found that there are wide differences among individuals. There have been no conclusive studies indicating any significant differences in taste sensitivity between people of different ages; however, sex differences in taste sensitivity do seem to exist. Most results have indicated that women are more sensitive to taste than men.²

Korslund and Eppright reported that taste sensitivity may be one of the many physiological factors influencing the eating behavior of children.³ They found that children with low-taste sensitivity tended to accept more foods and to have more enthusiasm for food.

¹Ethel A. Martin, Nutrition in Action (New York: Holt, Rinehart, and Winston, 1965), p. 16.

²Ercel Eppright, Mattie Pattison, and Helen Barbour, Teaching Nutrition (Ames, Iowa: The Iowa State University Press, 1964), p. 68.

³Mary K. Korslund and Ercel S. Eppright, "Taste Sensitivity," Journal of Home Economics, 59: 168-70, March 1967.

Objectionable textures also can affect food preferences. Food acceptance can often be widened by removing those parts of a food that seem to give the food dish an objectionable texture, such as peelings, pulp, etc. Caution should be used in removing parts of a food, however, as there is danger of losing some of the nutritive value of the food.¹

Some controversy exists in regard to the question of whether individuals instinctively have the tendency to choose the appropriate foods to meet their body's requirements. It has been reported that people with certain metabolic diseases crave substances they lack. However, if such a mechanism does exist within the individual at birth, it soon becomes ineffective as he becomes affected by other influences in his environment. Nutrition scientists are still questioning the facts concerning the role that certain body mechanisms such as appetite, blood chemistry and metabolic rate have upon the intake of food.²

The occurrence of obesity and overweight in this country bears witness to the fact that appetite is an unreliable guide to the amount of food needed. Overweight and obesity are the results of overeating. However, scientists do not completely understand the relationship between weight gain

¹Eppright, op. cit., p. 69.

²Ibid.

and food intake.¹ Studies have indicated that obese teen-agers do tend to skip more meals, leave fruits and vegetables out of meals, and have diets with lower caloric and nutrient intake than those teen-agers considered to be lean.²

In a study of Iowa girls, it was found that girls who matured either early or late were conspicuous for their poor eating behavior. The earlier maturing girls also had a tendency toward overweight.³

Concepts and Techniques for Teaching Nutrition in the Junior High School

Nutrition is a changing field of science with many controversial problems still to be answered. On the one hand, there is a host of existing information that needs to be interpreted to the student in a meaningful way, while, on the other, one is confronted with an ever-increasing amount of new data.⁴

The teacher's knowledge of nutrition and her teaching skill will greatly affect the degree to which the objectives

¹Katherine H. Fisher and Raymond W. Swift, "Calories and Body Weight," The Yearbook of Agriculture (Washington D. C.: U. S. Government Printing Office, 1959), pp. 101-11.

²Mary C. Hampton, et. al., "Caloric and Nutrient Intakes of Teen-Agers," Journal of American Dietetic Asso., 50: 385-96, May, 1967.

³Ercel Eppright, Mattie Pattison and Helen Barbour, Teaching Nutrition (Ames Iowa: The Iowa State University Press, 1964), p. 85.

⁴Ibid., p. 12.

for any given course in nutrition are realized. Taylor¹ stated that nutrition education for teachers pays dividends beyond measure. She further sums up the advantages of qualified teachers as:

"They develop an appreciation and comprehension of the health advantages of good nutrition.

They and the children they teach derive lasting personal benefits.

They learn to recognize children in their classrooms who may be nutritionally under par.

They develop greater facility in presenting nutrition facts in practical, simple, terms.

They are better able to guide parents in helping children to maintain good nutrition practices at home.

They have opportunities to see how nutrition can be projected into existing classroom programs.

They develop confidence in using nutrition facts and activities in their classroom programs.

They learn how to use nutrition experiences to enrich many areas of study in the curriculum."

The junior high school student is in a transitory stage of physical, mental and social growth. This stage of puberty is customarily attended by a pronounced concern with the functioning and the appearance of their bodies.²

¹Ethel A. Martin, Nutrition Education in Action (New York: Holt, Rinehart and Winston, 1966), p. vii, citing Clara Mae Taylor, Professor of Nutrition, Teachers College, Columbia University.

²Harold F. Cottingham and William E. H6pke, Guidance in the Junior High School, (Bloomington, Ill.: McKnight and McKnight, 1961), p. 129.

The emotional state of the junior high student is generally considered to be ambivalent. On the one hand, he wants to be self-directing, while, on the other, he often feels the need for the stabilizing influence of adults whom he can trust.¹

Learning experiences for the junior high student should be directed toward helping him to interpret his own experiences in view of both his strengths and weaknesses. Selected learning experiences should be student-centered and stem from the student's individual needs.²

Basic nutrition concepts. The perplexity of the task of communicating the concepts and principles of nutrition has given rise to a recommendation by the National Nutrition Education Committee to formulate a body of nutrition concepts suitable to aid communication with persons from all age, educational and environmental levels.³

The basic concepts adopted by the Interagency Committee on Nutrition Education are as follows:

1. Nutrition is the food you eat and how your body uses it.

¹Mauritz Johnson, Jr., William E. Busacker, and Fred Q. Bowman, Jr., Junior High School Guidance (New York: Harper and Bro., 1961), p. 56.

²Donald G. Mortensen and Allen M. Schmuller, Guidance in Today's Schools (New York: John Wiley and Sons, Inc., 1966), p. 105.

³Ruth M. Levertton, "Basic Nutrition Concepts," Journal of Home Economics, 59: 346-48, May, 1967.

2. Food is made up of different nutrients needed for growth and health.
3. All persons, throughout life, have need for the same nutrients, but in varying amounts.
4. The way food is handled influences the amount of nutrients in foods; its safety, appearance and taste.

The nutrition educator should be aware that these four basic concepts are fundamentals to be developed through education and practice, not merely facts to be presented or taught.¹

There have been other contributions to the literature of concepts and techniques for teaching nutrition that the nutrition educator should be aware of before planning the learning experiences for any teen-age nutrition program. A teacher should realize, for instance, that teen-agers are interested primarily in being attractive or strong, and that they enjoy social gatherings and participation in group activities.² Eating is usually part of their social pattern, and many of their calories come from party-type foods. They enjoy preparing special-occasion foods for friends and family.³ The teacher should take advantage of these interests

¹Mary M. Hill, "A Conceptual Approach to Nutrition Education," Journal of American Dietetic Asso., 49: 20-22, July, 1966.

²Improving Teen Age Nutrition (Manhattan, Kansas: Kansas State Extension Service, MF100, Dec. 1964), pp. 8-9.

³Sadye F. Adelson, Margaret Alexander, and Evelyn Spindler, "Youth Learns About Food," The Yearbook of Agriculture, (Washington D. C.: U. S. Government Printing Office, 1959, pp. 647-52.

to teach teen-agers about nutrition and the selection and preparation of food.

Leverton has stated that man can influence his internal environment, improve life expectancy, and extend his prime of life by eating the right food and being well-nourished.¹ This concept implies that each individual has a significant measure of control over his present and future well-being. Teen-agers should be aware that they have the primary responsibility over their state of health and vitality.

The cellular concept. The development of the "cell theory," the theory that all living things are composed of cells, by Theodor Schwann in 1839, has led scientists to a new understanding of the physiology of nutrition.² Today's scientists realize that the key to understanding nutrition is to understand the carefully regulated metabolic interplay between the component parts of the cell and the nutrients undergoing metabolism.³

Each body cell must perform certain activities if the whole human organism is to function at an optimum level. The energy needed to carry out life's activities is supplied by foods, primarily those foods with a high fat, carbohy-

¹Leverton, loc. cit.

²John G. Navarra, Joseph Zaffaroni, and John Edward Garone, Life and the Molecule (New York: Harper and Row, 1966), p. 97.

³Jerry M. Rivers and Marjorie M. Devine, "Teaching Nutrition Concepts," Forecast for Home Economics, 12: 26-28+, Feb., 1966.

drate, and protein content. Protein along with the other nutrients, vitamins, minerals, and water, also is essential to the synthesizing of materials necessary for growth and maintenance and for the transporting of food materials in and out of the cell.¹

An understanding of this orderly interaction between the human body and the foods we eat can make the study of foods and nutrition more meaningful.

Breakfast and snacks. Carefully designed research projects and studies of every sort have proved that there are sound scientific reasons for eating a good breakfast. A good breakfast contributes considerably to the nutritive value of the day's meals, and to the energy output of the individual particularly during the morning hours.² A good breakfast is one that provides from one-fourth to one-third of the day's caloric requirement and includes foods rich in protein, vitamins and minerals.³ Leverton stated that a good breakfast will include servings from at least three of the four groups in the Daily Food Guide.⁴

Teen-agers often exhibit poor breakfast habits. The

¹Ibid.

²Fredrick J. Stare M.D., Eating for Good Health (New York: Doubleday and Co., 1964), pp. 36-38.

³Belle L. Pollard, Experiences with Foods (New York: Ginn and Co., 1964), p. 35.

⁴Ruth M. Leverton, Food Becomes You (New York: Doubleday and Co., Inc., 1961), p. 82.

most frequent reasons given for not eating breakfast have been "not hungry," "watching calories," and "don't have time." Those persons who have developed the habit of neglecting breakfast many times make up the shortage of calories by overeating at lunch or indulging in high-calorie, low-nutrient value snacks.¹

Studies have shown that children who do not eat breakfast invariably have a less desirable food intake than those who eat a regular morning meal. In a questionnaire survey of breakfast habits given to 10,144 California junior and senior high school students, it was found that six per cent indicated that they never ate breakfast, 26 per cent indicated that they did sometimes. The reason given by over half of those not eating breakfast or doing so irregularly was lack of time.²

Many teen-agers, girls in particular, are concerned about gaining weight. Girls are likely to drop out of active sports when they are in their teens which increases the possibility of their becoming overweight. A possible solution to the problem of weight control is to teach the importance of maintaining a balance between caloric intake and energy expended. Teach teen-age girls to recognize

¹Pollard, loc. cit.

²Eva D. Wilson, Kathern H. Fisher and Mary E. Fugua, Principles of Nutrition (New York: John Wiley and Sons, Inc., 1967), p. 438.

³Leverton, op. cit., p. 122.

the importance of walking or engaging regularly in setting-up or daily dozen type of exercises that can be done in the confinement of a room.³

Particularly for teen-agers, snacks make up a large part of the daily nutrient intake. Studies have indicated that, on the average, snacks may furnish as much as 15 per cent of the total calories of the teen-age girl.¹

If snacks are planned to contribute part of the daily food requirements, they can be an asset to the daily diet. However, studies have indicated that snacks contribute more to the calorie allowance than to the nutrient allowance of the diet of most teen-agers.²

The unit approach. The "unit approach" for teaching nutrition has been found to be useful and more challenging for the student as it lends itself to the incorporation of learnings from other areas of the school program with those obtained from the nutrition unit.

A nutrition unit is a series of planned coordinated experiences centered around a central topic which deals with a particular nutritional problem. During the progress of the unit, students can engage in various activities that are designed to help them acquire new knowledge, under-

¹Ercel Eppright, Mattie Pattison and Helen Barbour, Teaching Nutrition (Ames, Iowa: The Iowa State University Press, 1964), p. 61.

²Ethel A. Martin, Nutrition in Action (New York: Holt, Rinehart, and Winston, 1965), p. 217.

standing, and skills in relation to the problem. Resource materials for the outlined activities may stem from other areas such as health, social studies or the science class.¹

Nutrition-science related activities. Nutrition as a body of knowledge is based on scientific discovery and related principles. Consequently, science has become a vehicle for teaching nutrition. The life sciences in particular offer many opportunities to correlate nutrition-science learning experiences. Many experiments are as applicable in the foods laboratory as in the science class. Experiments based on the principles of nutrition can guide the students in attaining deeper insights and understandings about why certain substances found in foods are essential to individual health and well-being. Showing can often direct the thinking to a desired conclusion more effectively than merely "telling."²

Piltz stated that by relating science principles and nutrition learnings one can guide the student toward a better understanding of his relationship to his total environment.³

Concepts such as "plants and animals are dependent upon

¹Ethel A. Martin, Nutrition Education in Action (New York: Holt, Rinehart and Winston, 1966), p. 45.

²Ibid., pp. 49-51.

³Albert Piltz, Ph. D., How Your Body Uses Food (Chicago: National Dairy Council, 1966), Teacher's Guide.

each other," "chemicals necessary to cells are called nutrients," and "nutrition is an essential problem of future space travel," help the student to relate the physical, scientific, and social aspects of his environment. Identifying these relationships can help him to understand his role in the nutrition process.

Student-centered activities. Student-centered activities can involve the individual student or they can be directed toward motivating effective group work. Learning to work effectively in small groups is important. Ways of working together effectively in small groups at school can transfer directly to working together as a family unit.¹

Activities oriented toward student participation have other intrinsic values. Student-centered activities generally present a problem-solving situation which requires the student to call upon his abilities to think through a situation and come up with a solution. Problem-solving activities offer the student more opportunities to think critically and to develop creative solutions to immediate problems. Home economics classes offer excellent opportunities for students to participate in group experiences in cooperative planning and problem-solving.²

¹Olive A. Hall and Beatrice Paolucci, Teaching Home Economics (New York: John Wiley and Sons, Inc., 1961), pp. 185-204.

²Ibid.

Student participation in planning for teaching materials and evaluation devices also is highly recommended. When pupils are asked to share the responsibility for selecting visual aids such as filmstrips, recordings or other course materials, they feel a sense of pride and belonging because their judgement is valued. They are likely to view visual materials more attentively and critically when they are enlisted as previewers.¹

Nutrition evaluation. Nutrition knowledge and attitude pre-tests can serve as a means of identifying the types of information and learning experiences to be included in a study of nutrition. This information can be useful particularly when students come into the secondary school system from various elementary schools. Knowledge and attitude tests, however, should not be misconstrued to represent the students current food habits.²

Methods commonly used to discover and evaluate student food practices are the three to seven-day record of all foods eaten, observations, and personal or parent interviews.³ Results of these procedures can be examined

¹Erce! Eppright, Mattie Pattison and Helen Barbour, Teaching Nutrition (Ames, Iowa: The Iowa State University Press, 1964), pp. 198-216.

²Ethel A. Martin, Nutrition Education in Action (New York: Holt, Rinehart and Winston, 1966), p. 120.

³Eppright, op. cit., p. 162.

qualitatively to determine the types of foods eaten from each of certain food groups. A quantitative analysis of the nutrient value of the diet can be determined and compared with Recommended Daily Dietary Allowances.¹ The method of evaluation used will depend upon the maturity of the students and how the information will be used.

Observations of growth patterns and appearance are other methods of evaluating an individual's nutritional status. Students should be encouraged to evaluate their own body structure in relation to national norms. Tables of standard body weights and heights can aid the student in making this evaluation.² One of the most difficult concepts to teach is that good nutrition affects how you look. Students should be given the opportunity to identify the characteristics of well-nourished and poorly-nourished individuals.³

Nutrition evaluation should be looked upon as a continuous process. It should serve as a guide for the teacher in determining what direction the course should

¹Erceel Eppright, Mattie Pattison and Helen Barbour, Teaching Nutrition (Ames, Iowa: The Iowa State University Press, 1964), p. 105.

²Ruth M. Leverton, Food Becomes You (New York: Doubleday and Co., Inc., 1961), pp. 115-16.

³Eppright, op. cit. p. 105.

follow. Evaluation should be included in the original plans for the teaching unit and structured so that it becomes part of the learning experience.¹

Martin² also stated that student self-evaluation is particularly effective. Therefore, the teacher should guide the students individually or in groups in evaluating their own learnings in view of their individual and class objectives for the nutrition activity.

¹ Martin, op. cit. pp. 115-21.

² Ibid.

DEVELOPMENT AND ADMINISTRATION OF THE PRE-TEST

The pre-test can serve as a valuable tool for evaluating the amount of knowledge gained by a particular student over a given period of time. It also may serve as motivation for the student to want to accept the responsibility for his own learning.

It has been stated that the pre-test should be a part of a planned unit of study to help alleviate the occurrence of repetition and overlapping of learning experiences.¹

The teacher may use the results of a pre-test to gain a better understanding of how much to expect of each student and to determine what goals are realistic for the various individuals and the class. The results also may indicate a need to revise the approach used to teach the unit.

The pre-test (Appendix A - "What Do You Know About Foods and Nutrition?") was given to 202 seventh grade students at Raytown South Junior High School, Raytown, Missouri soon after enrollment in September and before any formal instruction had been given.

The content of the test was developed from basic concepts about foods and nutrition that the teacher proposed to use later in developing a unit of instruction entitled "Food Needs of the Body." The subject content of the pre-

¹Erce! Eppright, Mattie Pattison and Helen Barbour, Teaching Nutrition (Ames, Iowa: The Iowa State University Press, 1964), pp. 214-15.

test included:

- (1) caloric value of foods,
- (2) nutritional value of foods with emphasis on the importance of the six nutrients,
- (3) Basic Four Food Groups,
- (4) nutritional aspects of meal planning.

The pre-tests were scored and the questions tallied to determine which ones were most frequently missed. It was found that the following questions were missed by 50 per cent or more of the students participating in the pre-test:

8	17	23	28	33-42
9	18	24	29	43-48
10	20	25	30	49-56
12	21	26	31	57-60
14	22	27	32	

The questions most frequently missed were: 8, 9, 10, 12, and 14.

Based on the results of the pre-test, it has been concluded that the students tested were relatively unfamiliar with the following concepts:

- (1) nutrients - They could not identify common food sources and functions of the essential nutrients.
- (2) calorie - They did not evidence a clear understanding of the meaning of the term. They were more familiar with high-calorie foods than with low-calorie foods.
- (3) Basic Four Food Groups - More than half of the students could not name the four groups or the amounts of food needed from each group daily.

The meat group was listed most frequently.

The bread and cereal group was omitted most frequently.

- (4) food energy - More than half of the students could not explain the effects of food intake greater than energy requirement. Also, they could not give the factors which affect individual energy requirements.

DEVELOPMENT AND ADMINISTRATION OF A DAILY DIETARY RECORD AND EVALUATION SHEET

Food habits of individuals are often obtained by keeping a record of all foods eaten over a specified period of time. It has been stated that a one-week record was sufficiently long to give representative information for use as the basis of an educational program.¹ Martin² described a 24-hour nutrition questionnaire recommended for use with young children, while, Eppright, Mattison, and Barbour suggested a 3 to 7-day record of all foods eaten to determine the food practices of students.³

A record of daily dietary intake should be an honest report. Everything eaten should be recorded along with the amounts, including snacks. The record should be kept on days when the individuals participating are experiencing normal eating days.⁴

The dietary record form (Appendix B - "My Diet Diary") and the evaluation form (Appendix C - "Diet Check Up - How Do You Rate?") were developed after observing other

¹Eva D. Wilson, Kathern H. Fisher and Mary E. Fugua, Principles of Nutrition (New York: John Wiley and Sons, Inc., 1967), p. 352.

²Ethel A. Martin, Nutrition Education in Action (New York: Holt, Rinegart and Winston, 1966), p. 4.

³Ercel Eppright, Mattie Pattison, and Helen Barbour, Teaching Nutrition (Ames, Iowa: The Iowa State University Press, 1964), p. 162.

⁴Wilson, op. cit.

published forms.^{1,2,3} Since the forms were intended to be used with 7th grade homemaking students, meeting only every other day, an effort was made to keep the forms simple.

For the survey, thirty girls from two homemaking classes were asked to keep a record of all food eaten on three regular school days. It was decided to keep a 3-day record for the sake of convenience since the classes never meet more than three times in one week. Time was allotted during class periods to record information. During this time, the teacher examined records for completeness and answered questions from the class. The instructions given the girls for recording data were as follows:

1. List all the foods you eat for three days.
Record everything you put into your mouth and swallow.
2. Include all "extras:" snacks, candy bars, butter, etc.
3. List separately the different foods that compose one diet item, such as the "makings" of a sandwich.
4. Estimate amount of each food eaten. List number of servings or quantity.

Each girl evaluated her own diet for the three days by transferring the information from the "Diet Diary form to the

¹ Martin, op. cit., p.5.

² Ethel A. Martin, Nutrition in Action (New York: Holt Rinehart, And Winston, 1965), p. 261.

³ Eppright, Pattison and Barbour, op. cit., pp. 295-96.

"Diet Check-Up" form. After all food items were listed under the correct food groups, daily diets were evaluated according to the specifications of the section entitled "Diet Evaluation."

The "Diet Evaluation" was designed to give the daily diet a numerical value. A total of 15 points indicated a superior diet which met all of the Basic Four Food requirements. Those diets which scored 13 or 14 were considered to be good providing none of the four food groups was left out entirely. Those diets with scores below 11 were considered to be in need of improvement.

A discussion of the nutritional status of the class was motivated by plotting a graph on the board illustrating the number of diets which did not satisfy each of the eight requirements outlined in the "Diet Evaluation."

Figure 1 illustrates the graph indicating the number of girls whose diets did not satisfy the eight requirements of the "Diet Evaluation." More than half of the girls participating in the diet evaluation failed to satisfy the Recommended Daily Dietary Requirement for milk, eggs, fruits, vegetables, breads and cereals.

FOOD REQUIREMENTS

- (1) one quart of milk
- (2) two or more servings from the meat group
- (3) one serving of lean meat
- (4) an egg
- (5) four servings from the fruits and vegetable group
- (6) a dark green or yellow vegetable
- (7) a citrus fruit or a good source of vitamin C
- (8) four servings of enriched or whole grain breads and cereals.

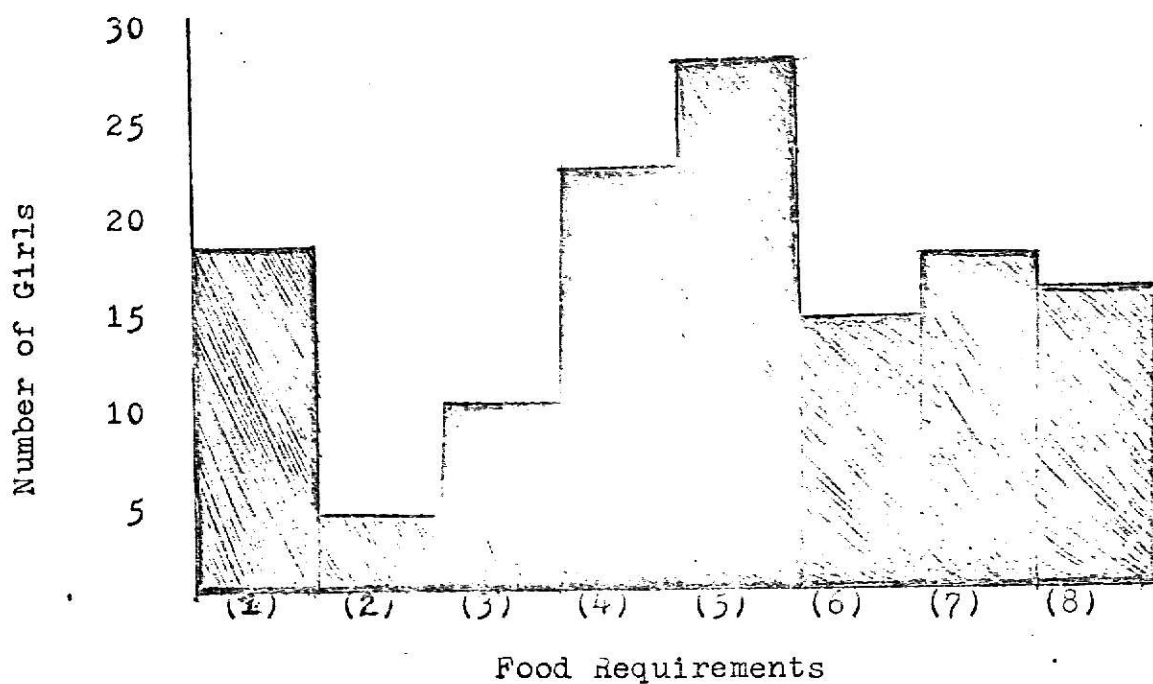


FIGURE 1

NUMBER OF GIRLS WHOSE DIETS DID NOT MEET THE EIGHT FOOD REQUIREMENTS OF THE DIET EVALUATION

RESOURCE UNIT

THE UNIT

The resource unit in this report was developed for seventh grade home economics classes at Raytown South Junior High School and has been entitled "Food Needs of the Body." Development of the unit proceeded in terms of concepts basic to the study of foods and nutrition and in view of expected goals or objectives to be attained. Content for the unit was based upon the results of a pre-test and the evaluation of individual daily dietary records.

Basic Concepts

In a recent conference, the Interagency Committee on Nutrition Education adopted a set of concepts they felt summarized all of the nutrition knowledge that is applicable to food-for-people-for-health.¹ The author desires to adopt the "Basic Nutrition Concepts" outlined by the aforementioned committee as a guide for the development of the proposed resource unit. Therefore, the basic concepts for the foods and nutrition unit "Food Needs of the Body" are:

- (1) Nutrition is the food you eat and how the body uses it.
- (2) Food is made up of different nutrients needed for growth and health.

¹Ruth M. Leverton, "Basic Nutrition Concepts," Journal of Home Economics, 59: 346-48, May, 1967.

- (3) All persons, throughout life, have need for the same nutrients, but in varying amounts.
- (4) The way food is handled influences the amount of nutrients in foods, its safety, appearance and taste.

Unit Objectives

The seventh grade home economics program at Raytown South Junior High School was designed to be an introductory and exploratory course in the various areas of home economics. In view of this approach, it was the opinion of the author that a unit in foods and nutrition should concentrate on the individual and his role in the food-for-health process. The objectives for the unit were developed to anticipate an increased understanding of foods and nutrition in the following ways:

- (1) Increases understanding of the nutrient value of food and how it is used in the body.
- (2) Increases vocabulary used in the study of foods and nutrition.
- (3) Increases understanding of individual food requirements.
- (4) Increases understanding of the factors which affect the planning and selection of a nutritionally-balanced diet.
- (5) Increases understanding of the importance of practicing good nutrition.
- (6) Increases ability to plan and select a nutritionally-balanced diet.

Content

The subject content covered in the unit has been divided into four major areas entitled:

- "A Daily Guide to Good Eating."
- "Nutrition and You."
- "Nutrients and Their Function."
- "Planning and Preparing Nutritious Meals and Snacks."

The four major areas have been developed to include student objectives, learning activities, supporting generalizations, subject-matter content and a means of evaluation. The author has endeavored to develop student-centered learning activities based upon related principles of science

UNIT: "FOOD NEEDS OF THE BODY."

MAJOR AREA: "A DAILY GUIDE TO GOOD EATING."

OBJECTIVES:

Acquires knowledge of the "Basic Four Food Groups."

Recognizes the importance of using "A Daily Food Guide" to select a balanced diet.

Understands individual food requirements.

SUPPORTING GENERALIZATIONS:

The "Basic Four Food Plan" divides foods into four big groups on the basis of the type and amounts of nutrients that they contain.

Use of a daily food guide assures the individual of a more adequate diet.

Activities and Procedures	Content
Study "A Guide to Good Eating."	This food guide (Appendix E) is the foundation of a nutritionally-balanced diet. It is made available by the National Dairy Council, and recommended by the Council on Foods and Nutrition of the American Medical Association.
Discussion:	
"What kinds of foods are found in each of the "Four Food Groups?"	<u>Milk Group</u> - all dairy products. <u>Meat Group</u> - meats, fish, poultry, eggs, or cheese - with dry beans, peas, nuts as alternates. <u>Vegetables and Fruits</u> - all varieties of fruits and vegetables. <u>Breads and Cereals</u> - all products made from enriched or whole grain cereals.

Activities and Procedures	Content
"How many servings from each of the "Four Food Groups" are recommended for teen-agers daily?"	<u>Milk Group</u> - 4 or more glasses. <u>Meat Group</u> - 2 or more servings. <u>Vegetable and Fruits</u> - 4 or more servings. Include a dark green or yellow vegetable and a citrus fruit or tomatoes. <u>Breads and Cereals</u> - 4 or more servings of enriched or whole grain products. Added milk improves the nutritional values.
"How would you use the "Guide to Good Eating" to plan a day's menus for a teen-age girl?"	Select a variety of foods from each of the four food groups in adequate amounts. Teen-agers need additional amounts of milk, meat, and foods containing iron for proper growth. Active teen-agers also may need additional food to provide energy.
"Why does the guide exclude dessert foods, butter, sugar, candy, and cokes?"	These foods are sometimes called "other" foods. They supply primarily calories to the diet, therefore, are to be added only after the requirements given in the four groups have been satisfied.
Design a bulletin board or showcase display illustrating the "Basic Four Food Plan."	Food requirements should be distributed over three balanced meals, including snacks if desired.
Prepare a report on "The Value of the Basic Four Food Plan" as an assignment to be given to an outside group such as a health or science class or Scout program.	A common rule for planning a "balanced" meal is to include a food from each of the "Basic Four Food Groups."

MEANS OF EVALUATION:

Observe ability to discuss information from "A Guide to Good Eating."

Note ability to interpret and illustrate the "Basic Four Food Plan."

UNIT: "FOOD NEEDS OF THE BODY."

MAJOR AREA: "NUTRITION AND YOU."

OBJECTIVES:

Increases understanding of the meaning of nutrition.

Recognizes personal diet and health patterns.

Understands the relationship between good nutrition and personal health, appearance and vitality.

SUPPORTING GENERALIZATIONS:

Nutrition is a group of processes within the body which utilize the nutrients received from foods for growth, maintenance of body functions, and to build and repair body tissues.

The food you eat affects how you look, feel, and respond to your environment.

Self values and attitudes about foods can affect food consumption.

Learning Activities	Content
Learn vocabulary terms commonly used in the study of nutrition periodically as they apply to the learning situation.	Develop a list of vocabulary words from selected resource materials. (Appendix E)
Prepare oral or written reports on selected topics related to nutrition.	List suggested nutrition topics on board. Provide selected literature for a reading period. Suggested topics are: "Nutrition and Dental Health." "Eating and Your Complexion." "Calories and Your Weight."
Prepare a bulletin board or posters entitled "Nutrition in Action."	Select picture illustrations that show teen-agers engaged in activities requiring energy and vitality.

Activities and Procedures**Content****Discussion:**

"How does good nutrition affect the manner in which you carry out your activities?"

Have a nutrition quiz game. Select contestants from the class to take turns naming a rule of good nutrition that could be associated with each of several television slogans.

Keep a diet record of all foods eaten for a 3 to 7 day period.

Determine how well individual daily diets satisfied the recommended requirements of the Basic Four Food Plan.

Draw a graph illustrating the eating behavior of the entire class.

Discussion:

"What foods are most frequently left out of the diets of teen-age girls?"

Daily food intake affects the amount of energy available for both physical and mental activities.

Select several popular television slogans that can be easily associated with basic rules of good nutrition. An example would be: "A handshake instead of a kiss."

Explain how a good diet relates to healthy teeth, and how good teeth affect the condition of the breath.

Prepare a form for listing all foods and the amounts eaten. Include breakfast, lunch, dinner and snacks. See sample form. (Appendix B)

Prepare a diet evaluation listing the food requirements included in the Basic Four Food Plan, giving each a numerical value. Diets with the highest values should be considered most adequate. See sample form. (Appendix C)

Draw graph to illustrate the number of girls whose diets did not satisfy the requirements of the diet evaluation. (Refer to p. 37.)

Recent surveys indicate that teen-agers most frequently neglect to include in their daily diets foods that are good sources of calcium, iron, vitamins A and C. The diets of girls

Activities and Procedures	Content
"Why are some nutritious foods commonly left out of the diet of the teen-ager?"	tend to be less adequate than boys. Many teen-agers have false ideas about the nutritive values of certain foods.

MEANS OF EVALUATION:

Pencil and paper vocabulary quiz.

Evaluate written and oral reports.

Note discussion response.

UNIT: "FOOD NEEDS OF THE BODY."

MAJOR AREA: "NUTRIENTS AND THEIR FUNCTION."

OBJECTIVES:

Acquires knowledge about food nutrients and their functions.

Identifies foods which are good sources of each of the essential nutrients.

Recognizes the relationship between nutrient intake and good health.

SUPPORTING GENERALIZATIONS:

Nutrients are chemical substances needed daily by the body in amounts adequate to carry out normal body functions.

Nutrients, which are found in foods in varying amounts, are classified according to the nutrient present in greatest abundance.

Lack of certain nutrients in sufficient amounts can cause deficiencies and disease.

Learning Activities	Content
Study a chart of the essential food nutrients.	The nutrient chart should include the most essential nutrients, common food sources, and deficiency diseases caused by the lack of specific nutrients. See sample form. (Appendix D)
Illustrate the nutrients as the "building blocks" of foods.	Label different colored blocks to represent a specific nutrient. Arrange them into a pyramid. Have arrows pointing to pictures of good food sources of the nutrient.

Activities and Procedures**Content**

Use the "Food Nutrient Chart" (Appendix D) and Experiences with Foods by Pollard as references for the following questions and activities.

"What are the "building blocks" of foods?"

Nutrients are the component parts of all foods. The six essential nutrients are carbohydrates, fats, proteins, vitamins, minerals, and water.

The four most important minerals are calcium, phosphorus, iodine and iron.

The vitamins needed in greatest abundance are vitamin A, thiamine, niacin, riboflavin, vitamin C, and vitamin D.

"What nutrients provide the body with energy?"

When carbohydrates, fats, and protein are burned in the body, energy is produced. A food that contains lots of these nutrients will be relatively high in caloric or energy value.

"Explain how the following terms are related:

calorie, energy, weight.
(refer to Pollard, p. 4)

Foods burned in the body for energy produce heat which is measured in calories. High-calorie foods produce the most heat energy. Low-calorie foods produce less heat energy.

When the food eaten supplies only the energy (calories) needed, weight remains the same.

If the food intake is more than enough to meet the body's energy needs, the excess is stored, chiefly as body fat, and weight increases.

Activities and ProceduresContent

If the body does not receive enough food to meet the demands for energy, weight is lost.

Make a list of high-calorie foods and a list of low-calorie foods.

"What are the two sources of fats?"

Refer to a chart of food values. (Pollard, pp. 511-516)

Fats in foods come from both animal and plant sources. Meat, butter, whole milk and cheese are major sources of animal fat.

Plant foods such as corn, olives, nuts and soybeans contain considerable amounts of fat.

Test some common foods for the presence of fat.

Test for fat. Obtain a piece of unglazed paper. Rub pieces of food to be tested on the paper. Then hold the paper up to the light. If light comes through a translucent spot on the paper, fat is present.

"What are the two types of carbohydrates?"

Sugars and starches of various forms make up the group of nutrients called carbohydrates.

Test some common foods for the presence of sugar and starch.

Benedict's test for sugar. Place a small sample of each food to be tested in a test tube. Add 10 cc. of Benedict's solution to each tube. Note color.

Heat the test tubes over a gas burner until each solution boils. Note any change of color.

A green-red color indicates the presence of sugar. A bright orange color shows the presence of a great deal of sugar.

Activities and ProceduresContent

"What is the primary function of protein?"

"What are the two sources of protein? Which is the more important?"

"What is the special function of the most important minerals?"

Test for starch. Drop iodine onto foods to be tested. Note change of color.

A purplish, blue-black color indicates the color presence of starch.

Proteins are essential to the normal growth, repair and maintenance of body tissues.

Proteins in foods come from both animal and plant sources.

The kinds and amounts of amino acids in a protein determine its nutritive value.

Animal proteins, as a general rule, supply all of the essential amino acids in about the same proportions as they are needed by the body. They are called "complete" proteins.

Plant proteins are called "incomplete" because they do not contain all of the essential amino acids.

Calcium and phosphorus are needed to build strong bones and teeth.

Iron is needed for the development and functioning of the blood pigment, hemoglobin. The hemoglobin of the red blood cells makes it possible for the blood to carry oxygen to the lungs and other body tissues.

Iodine is necessary for the thyroid gland to function properly.

Activities and Procedures	Content
"What are vitamins?" (Refer to Pollard, p. 13)	Vitamins are organic substances present in very small amounts in natural foods, and sometimes produced within the body.
"List three important functions of water in the body." (Refer to Pollard, p. 17)	Water makes up about one-half of total body weight. It is essential to every body process. Water serves as a solvent to aid digestion. It serves as a carrier, transporting, by means of the blood stream, nutritious substances in solution to all parts of the body. Water regulates body temperature through evaporation via the skin and lungs.
Show the filmstrip "Vitamins and You." Repeat, showing specific frames with review questions. 1. Frame(11) E.V. McCollum in his laboratory. "What was the experiment that led to the discovery of vitamin A?"	In 1907, E. V. McCollum began a five-year feeding experiment with rats at the University of Wisconsin. Two groups of rats were fed exactly the same foods, with one difference. Group A was given "butter" as a fat, and Group B was given lard. The "butter" rats grew big, sleek and healthy. The "lard" rats hardly grew at all. In 1913, McCollum identified a substance in butter not present in lard. He called this substance vitamin A.
2. Frame(15) Human cell. "Name the six nutrients carried by the blood to all body cells."	Review six nutrients.

Activities and Procedures	Content
3. Frame(24) Football player with broken arm.	Lack of vitamin C can cause anemia, slow healing of wounds, and the disease scurvy.
"What symptom may be a sign that the body is not getting enough vitamin C?"	
4. Frame(25) Persons viewing a movie.	Lack of vitamin A might result in a disease called night blindness. This is a disease in which a person cannot see well in darkness or when in dim light.
"What symptom may be a sign that the body is not getting enough vitamin A?"	
5. Frame(29) Doctor examining teen-agers.	In a recent survey of several thousand Iowa teen-agers, a medical research team found obesity, anemia, and low vitamin C intake as predominant signs of poor nutrition.
"Name three mistakes in eating often found among teen-age boys and girls."	
Discussion:	
"How do the nutrients received in foods reach the individual cells of the body."	
Read and discuss Chapter 3 of "How Your Body Uses Food."	Booklets can be obtained through local or National Dairy Council.

MEANS OF EVALUATION:

Pencil and paper test requiring the association of specific vitamins with food sources, body functions, and deficiency diseases.

Note oral response.

UNIT: "FOOD NEEDS OF THE BODY."

MAJOR AREA: "PLANNING AND PREPARING NUTRITIOUS MEALS AND SNACKS."

OBJECTIVES:

Understands the importance of eating a balanced diet.

Recognizes the relationship of meal patterns to total daily food intake.

Applies basic skills in planning and preparing nutritious meals and snacks.

SUPPORTING GENERALIZATIONS:

A balanced-diet includes adequate amounts of all the foods needed by the body for its' proper function.

Nutritionally-balanced meals, spaced adequately throughout the day, are necessary to the proper functioning of the body.

The manner in which food is handled and prepared affects its' nutrient value.

Activities and Procedures	Content
Show filmstrip "Judy's Family Food Notebook."	
Discussion:	
"Why does the body need food?"	The body uses food to carry out three big jobs: (1) to provide warmth and energy; (2) to build and repair body tissue; and (3) to regulate body processes.
"Why did father, Judy and baby Tim all require different amounts of food?"	The amount of food needed by each person depends upon their age and how they work or play.

Activities and ProceduresContent

"What other factors affect how well your food works for you in your body?"

Discuss the meaning of a nutritionally-balanced meal.

Use food models to illustrate nutritionally-balanced meals. Also, consider variety in color, texture and size of serving.

Plan a day's menu for a teen-age girl. (Refer to Experiences with Foods, pp. 84-5)

Plan, prepare, and serve a nutritious snack.

Food is best used by a healthy body. A healthy body needs plenty of rest and exercise, and must be kept free of disease.

A nutritionally-balanced meal usually includes a food dish from each of the Basic Four Food Groups.

Food models can be ordered from the Dairy Council.

A day's menu for a teen-age girl should include:

milk or dairy foods equivalent to one-quart of milk;
two or more servings from the meat group;
an egg at least every other day;
a dark green or yellow vegetable;
a fruit or vegetable high in vitamin C;
two other varieties of fruits or vegetables;
four or more servings of enriched or whole-grain cereal or bread.

Teacher led, teacher directed laboratory.

1. Work with class to plan the preparation of a snack.
2. Direct volunteer hostesses where to get the equipment and supplies.
3. Direct hostesses in proper preparation techniques.

Activities and Procedures	Content
Show filmstrip, "Breakfast for B. J."	4. Have hostesses serve the finished product to class members. 5. Direct clean-up procedures. 6. Discuss with the class the nutritional contribution of the snack to the daily diet. This filmstrip emphasizes the importance of breakfast to the health, appearance, and vitality of the teenage girl. It reviews the Basic Four Food Plan, and offers many smart ideas for making breakfast more interesting.
Plan, prepare and serve several types of breakfast fruits rich in vitamin C.	Teacher demonstration. Suggested fruit dishes: Spiced tomato juice Orange slices or pinwheels Grapefruit-filled baskets Strawberry-banana parfait Cantaloupe al a mode
Read and discuss the leaflet entitled, "A Quart of Milk a Day."	These leaflets may be ordered from the Dairy Council.
Plan, prepare and serve several milk beverages.	Teacher demonstration. Use blender to combine various types of fruit with milk for breakfast beverages. A variety of ideas can usually be found in a blender recipe book. Distribute recipe sheets for home projects.
Plan and conduct an animal feeding experiment demonstrating the value of milk in the diet.	Refer to the Dairy Council's booklet entitled "Animal Feeding Demonstrations" for detailed instructions.

Activities and Procedures	Content
Study the composition, nutritive value, use and care of eggs.	Prepare mimeographed sheets for class. (Refer to Pollard, pp.60-68)
Illustrate important facts about egg selection and cookery.	Make overhead projection transparencies from 3M Brand's Printed Originals on eggs.
Plan, prepare and serve a simple egg dish.	Student laboratory.
Study the structure and composition of cereal grains.	Select recipes for fried, soft-cooked, hard-cooked, poached or scrambled eggs.
Discussion:	<u>Experiences with Foods.</u> p. 49.
"Describe the three main parts of a cereal grain."	<u>Bran</u> - brown outer covering made of many layers of cellulose.
"What food values do cereals contribute to the diet?"	<u>Endosperm</u> - central portion of kernel, the only portion left in highly refined cereals.
Illustrate the formation of gluten from wheat flour.	<u>Germ</u> - portion that sprouts when seed is allowed to grow.
	Cereals are a good source of energy, the endosperm portion being primarily starch.
	Whole-grain cereals have the bran and germ included which contribute more protein, minerals, vitamin E and fat.
	When the protein of wheat flour is combined with moisture and stirred or handled, gluten is formed. The gluten dough may then be formed into a ball and baked to demonstrate the contribution of gluten to the structure of a baked product.

Activities and Procedures	Content
"Name five grains commonly used in bread and cereal products."	Wheat, corn, oats, rye, and rice are the grains most commonly eaten in the mid-west.
Plan, prepare and serve several varieties of grain cereals.	Student tasting laboratory.
Make a report on a fruit or vegetable that is a good source of either ascorbic acid or vitamin A.	Prepare several varieties of refined or whole-grain cooked cereals. Compare differences in flavor and appeal. Note if cereal has been enriched.
Demonstrate the proper way to prepare vegetables rich in vitamin C.	Provide selected references for resource material.
Demonstrate the preparation of a dark green and yellow vegetable.	Teacher demonstration. Use fresh tomatoes, raw cabbage or fresh greens to prepare a vegetable dish. Class demonstrations. Have the girls in each kitchen select either a dark green or yellow vegetable to prepare as a class demonstration.

MEANS OF EVALUATION:

Evaluate daily menus.

Short paper and pencil quizzes as a review of: milk and milk products, eggs and egg cookery, grains and cereals.

Evaluate laboratory preparations and procedures.

Note oral response.

SUMMARY AND IMPLICATIONS FOR TEACHING

Nutrition education should be a continuous process, beginning with childhood, and, if it is to be effective, it must have meaning for the individual at all stages of development.

Nutrition education involves motivating individuals to want to provide their bodies with the necessary food requirements in adequate amounts, and to practice basic health habits that augment the nutrition process.

Teen-agers represent a segment of the population who exhibit the poorest eating habits. Among those teen-agers existing on inadequate diets, girls appear to be the most poorly fed.

Communication facilitates nutrition education. A major problem in motivating teen-agers to want to improve their diets lies in breaking down the various types of barriers that prevent fluent communication. It becomes the responsibility of the nutrition educator to develop improved methods of communicating the principles, facts, and attitudes that contribute to the practice of good nutrition.

The purposes of this study were (1) to develop and administer to 7th grade homemaking students a foods and nutrition pre-test and a questionnaire for recording daily dietary intake, and (2) to use the information obtained from the pre-test and dietary records to develop a foods

and nutrition resource unit. The study has been limited to 7th grade homemaking students at Raytown South Junior High School, Raytown, Missouri.

As a basis for determining the content for a resource unit in foods and nutrition, a review was made of related literature; a pre-test was given to all students enrolled in 7th grade homemaking; and, a 3-day dietary record was kept and evaluated by thirty girls in two homemaking classes.

The results of the pre-test revealed that in most cases the students were lacking in knowledge of the essential nutrients, their function and sources in foods, and, in an understanding of the relationship between food, energy, and health.

Comparison of the 3-day dietary records with the requirements outlined in the Basic Four Food Plan "A Guide to Good Eating" revealed that over half of the girls failed to satisfy the following requirements in their daily diet:

- a quart of milk
- an egg
- four or more servings of fruits
and vegetables
- a dark green or yellow vegetable.

The food requirement most often neglected was that of including four or more servings of fruits and vegetables in the diet daily.

A resource unit entitled "Food Needs of the Body" was developed to include student objectives, learning activities, supporting generalizations, subject-matter content and

evaluation. The unit was divided into four areas entitled:

- "A Daily Guide to Good Eating."
- "Nutrition and You."
- "Nutrients and Their Function."
- "Planning and Preparing Nutritious Meals and Snacks."

In developing the unit, emphasis was placed upon the construction of student-centered learning activities based upon related principles of science.

In view of the findings from this study, the author would like to propose the following implications for the teacher of nutrition in the junior high school.

First, concentrate on the development of avenues for communication. One of the first steps toward guiding students is to know them. Make use of student-centered activities to provide them with opportunities for self-expression and interaction with both the teacher and other members of the class. Maintain a positive attitude toward their present eating habits.

Look for opportunities to make the learning activities "come alive" for the student. Students are more highly motivated when they can relate the learning activity to something from their own environment.

It is important that the teacher investigate good sources of current literature, read it consistently for understanding, and, evaluate it in terms of its usefulness to the content of the unit of study. Be enthusiastic to develop new ideas and approaches for learning.

Last, but of no less importance, the teacher should be able to communicate through her personality and behavior a feeling for the value to the individual of eating a nutritionally-balanced diet and of practicing habits which cultivate good health.

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APPENDICES

APPENDIX A

WHAT DO YOU KNOW ABOUT FOODS AND NUTRITION?

Pre-Test
7th Grade

SCORE _____

NAME _____

DATE _____

True - False Circle T if the statement is correct.
Circle F if the statement is incorrect.

- T F 1. Nutrition is the process whereby food is taken into the body and utilized to nourish all of its parts.
- T F 2. Vitamins are needed to promote health and growth.
- T F 3. Nutrients are nourishing substances found in foods.
- T F 4. The only mineral needed for strong bones is calcium.
- T F 5. The kinds of food eaten can affect personality, appearance, posture, and vitality.
- T F 6. Carbohydrates, fats, proteins, vitamins and minerals are essential nutrients.
- T F 7. Nutrition is having plenty of food to eat.
- T F 8. Milk is a chief source of calcium, phosphorus, iron and ascorbic acid.
- T F 9. A calorie is a measure of energy.
- T F 10. A food that contains a small amount of carbohydrate, fat, or protein will be relatively high in calorie value.
- T F 11. Cereals contain "complete" proteins.
- T F 12. Proteins from animal products supply all of the essential amino acids.
- T F 13. It is best to omit breakfast when you have little time to eat.
- T F 14. Orange juice loses its vitamin-C value when exposed to air.
- T F 15. Fruits are rich sources of vitamins and minerals.

Multiple - Choice Circle the letter of the word or phrase that best completes each sentence.

16. A nutritionally-balanced breakfast would include
- A. cereal with milk and toast.
 - B. pastry, meat and milk.
 - C. pancakes and fruit juice.
 - D. fruit, eggs, cereal, and milk.
17. A carbohydrate that adds "roughage" to the daily diet is
- A. sugar
 - B. starch
 - C. cellulose
 - D. gluten
18. A nutrient which provides the body with heat and energy is
- A. minerals
 - B. protein
 - C. carbohydrate
 - D. vitamins
19. A fruit rich in vitamin C is
- A. apple
 - B. grapefruit
 - C. pineapple
 - D. prune
20. Foods that build and repair body tissue are rich in
- A. vitamin A
 - B. niacin
 - C. starch
 - D. protein

21. A source of plant fat is

- A. peanuts
- B. sweet potato
- C. peas
- D. lard

22. Whole grain flour and cereals should be kept in a cool, dark place because

- A. they will be protected from weevils.
- B. they contain a large amount of fat.
- C. they dry out easily.
- D. they contain a large amount of carbohydrate.

23. The vitamin found in dark green and yellow vegetables is

- A. vitamin C
- B. vitamin D
- C. vitamin B
- D. vitamin A

Matching Match each of the three words on the left with one of the five phrases on the right and place the number of your choice in the blank provided.

<u>Vitamin</u>	<u>Associated Term</u>
_____ 24. vitamin C	1. sunshine vitamin
_____ 25. vitamin D	2. energy food
_____ 26. niacin	3. B-complex vitamin
	4. ascorbic acid
	5. carotene

<u>Nutrient</u>	<u>Type of Nutrient</u>
_____ 27. mineral	1. starch
_____ 28. vitamin	2. iodine
_____ 29. carbohydrate	3. amino acid
	4. riboflavin
	5. oil

<u>Deficiency Disease</u>	<u>Cause of Deficiency Disease</u>
_____ 30. scurvy	1. lack of vitamin A
_____ 31. rickets	2. lack of protein
_____ 32. night blindness	3. lack of calcium
	4. lack of vitamin C
	5. lack of vitamin D

33-42.

Select a food(s) that is (are) good source(s) of the nutrients listed. Place the letter for the food(s) in the space provided. Food sources may be used more than once.

<u>Nutrients</u>	<u>Food Sources of Nutrients</u>
_____ good source(s) of protein	A. beef
_____ good source(s) of vitamin A	B. oranges
_____ good source(s) of calcium	C. tomatoes
_____ good source(s) of vitamin C	D. milk
_____ good source(s) of iron	E. eggs
	F. carrots
	H. apricots

Completion. Place the correct answers in the blanks provided.
Read each set of directions.

43-48.

List three foods that are high in energy (calorie) value and three that have a low-calorie value.

<u>High-Calorie Foods</u>	<u>Low-Calorie Foods</u>
_____	_____
_____	_____
_____	_____

49-56.

Name the Basic Four Food Groups and the number of servings needed daily.

<u>Food Groups</u>	<u>Number of Servings</u>
_____	_____
_____	_____
_____	_____
_____	_____

57-60.

Explain what happens when your food intake is more than enough to meet your energy needs. What factors determine how much food energy is needed by each individual?

APPENDIX B

MY DIET DIARY

NAME _____

DATE _____

1. List all of the foods you eat on the above date.
Record everything you put into your mouth and swallow.
2. Include all "extras:" snacks, candy bars, butter, etc.
3. List separately the different foods that compose one diet item, such as the "makings" of a sandwich.
4. Estimate amount of each food eaten. List number of servings* or quantity.

Example:	Grapefruit	One-half
	Toast, white	1 slice
	Butter	1 pat

Meal	Foods Eaten	Number of Servings
Breakfast		
Lunch		
Dinner		
Snacks		

*One serving equals one-half cup.

APPENDIX C

DIET CHECK-UP HOW DO YOU RATE?

NAME _____

DATE _____

Diet Record Summary

1. Make a record of all foods eaten in a day.
2. Place each food item eaten under the correct Food Group.
3. List the number of servings or quantity eaten.

Dairy Group	Amount	Breads and Cereals	Amount
Total Servings			
Meat Group	Amount	Fruits and Vegetables	Amount
Total Servings			

DIET CHECK-UP (Con't)

<u>Diet Evaluation</u>	<u>Points</u>
1. Give yourself 1 point if your diet included one quart of milk. 2. You receive 2 points if your diet included two or more servings from the meat group. 3. You receive a bonus point if one of these was a serving of lean meat. 4. Add another bonus point if you included an egg in your daily diet. 5. Give yourself 1 point for each serving of fruits or vegetables. (total points - 4) 6. Add a bonus point if one of these was a dark green or yellow vegetable. 7. You receive 1 point if your diet included a good source of vitamin C. 8. Give yourself 1 point for each serving of whole grain or enriched breads and cereals. (total points - 4)	
Total Points	
Excellent - 15	
Good - 12-14	
Needs Improvement - 11 or below	

APPENDIX D

FOOD NUTRIENT CHART

Nutrient	Food Sources	Function In Body
Carbohydrate	<u>starches</u> in cereal grains, breads, macaroni, and root vegetables <u>sugars</u> in raw form and in honey, jelly, syrups and fruits	provides heat and energy
Fat	<u>animal fats</u> such as meat, butter, whole milk and cheese <u>plant fats</u> such as margarines, cooking oils and cooking fats	provides heat and energy
Protein	<u>animal</u> (complete) milk, cheese, meat, fish, poultry, and eggs <u>plant</u> (incomplete) breads, cereals, dried beans and peas	builds and repairs body tissue provides some heat and energy
<u>Minerals</u>		
Calcium	milk, cheese, ice cream and leafy green vegetables	needed for strong bones and teeth
Phosphorus	milk, cheese, meats, fish, eggs, leafy green vegetables	aids calcium to build strong bones and teeth
Iron	all lean meats, especially liver, egg yolk, leafy green vegetables, dried fruit and nuts	helps build good blood

FOOD NUTRIENT CHART (Con't)

Iodine	salt-water fish iodized salt	helps prevent goiter
<u>Vitamins</u>		
Vitamin A	dark green and yellow vegetables, egg yolk, whole milk and organ meats	helps keep skin and membranes healthy protects against night blindness
Thiamine	whole grain or enriched breads and cereals, pork, liver, lima beans, peas	protects against the disease <u>beri-beri</u>
Riboflavin	milk, cottage cheese, liver, kidney, heart, lima beans and peas	helps keep vision clear and skin smooth
Niacin	whole grain and enriched breads and cereals, meat, fish, poultry and beans	protects against the disease <u>pellegra</u>
Vitamin C (ascorbic acid)	citrus fruits, tomatoes, canteloupe, raw cabbage and green peppers	aids the healing of wounds protects against <u>scurvy</u>
Vitamin D (sunshine vitamin)	fortified milk, butter, fish liver oil	aids body in absorbing calcium protects against <u>rickets</u>
Water	present in most foods especially, lettuce, watermelon, straw- berries and tomatoes	regulates body tempera- ture aids digestion carries nutrients in solution to all parts of the body

APPENDIX E

TEACHING MATERIALS

Books,

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**FOODS AND NUTRITION UNIT TO MEET THE NEEDS OF 7TH
GRADE PUPILS AT RAYTOWN, MISSOURI**

by

JOYCE LAVAUN RYERSON

B. S., University of Missouri at Kansas City, 1961

AN ABSTRACT OF A MASTER'S REPORT

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requirements for the degree

MASTER OF SCIENCE

College of Education

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ABSTRACT

Nutrition education involves motivating individuals to want to provide their bodies with the necessary food requirements in adequate amounts, and to practice basic health habits that augment the nutrition process.

Teen-agers represent a segment of the population who exhibit the poorest eating habits. Among those teen-agers existing on inadequate diets, girls appear to be the most poorly fed.

A major problem in motivating teen-agers to want to improve their diets lies in breaking down the various types of barriers that prevent fluent communication. There is a need for the nutrition educator to develop improved methods of communicating the principles, facts, and attitudes that contribute to the practice of good nutrition.

The purposes of this study were (1) to develop and administer to 7th grade homemaking students a foods and nutrition pre-test and a questionnaire for recording daily dietary intake, and (2) to use the information obtained from the pre-test and dietary records to develop a foods and nutrition resource unit. The study has been limited to 7th grade homemaking students at Raytown South Junior High School, Raytown, Missouri.

The investigator identified the essential nutrients lacking in the diets of two groups of homemaking students by means of a questionnaire on daily dietary intake.

The pre-test, given to all 7th grade homemaking students, revealed that in most cases the students were lacking in knowledge of the essential nutrients, their function and sources in foods, and, in an understanding of the relationship between food, energy, and health.

Literature related to nutrition education, together with information acquired by evaluating the questionnaires and pre-tests, provided the basis for a resource unit in foods and nutrition for 7th grade.

The investigator recommended that the home economics teacher strive for improved skill and competence in interpreting, communicating, and evaluating nutritional data. It also was suggested that emphasis be placed upon developing new techniques for motivating teen-agers to improve their eating habits.