

CHAPTER FIVE

Methods and Tools

The attitude of people toward health and food is difficult to understand. The public is health-minded. They are confident that certain constituents of food, the vitamins in particular, will promote health. In the minds of the public the words *vitamins* and *health* are probably synonymous. People spend millions of dollars for vitamins in the form of pills, when the same amount of money spent for vitamin-rich foods would be more likely to give them the health they seek.

Nevertheless, when we suggest to people that they eat more of certain foods because of their health-giving properties, we often meet resistance. In fact, people sometimes appear to take a strange delight in eating what is not good for them. While seeking health, they love their ailments and guard as an inalienable right the privilege of eating what they wish, regardless of the consequences to themselves and to society. They may actually fancy themselves as exceptions and take pride in the idea that they can defy the laws of nature.

Possibly the appeal either to health or to civic responsibility ignores the values that many people consider most important. Both health and civic responsibility are values that are generally approved and, therefore, people are likely to give lip service to them. Other values, such as independence, may be much more important in actually directing their own actions.

You may learn much about the problems involved in introducing

a food not commonly used from the story of the introduction of the potato to European diets. The establishment of the potato as a common food in Europe required more than 200 years. Reactions to it in the seventeenth century were very similar to our own resistance to the soybean in this enlightened age; it was considered fit only for animal food.

The potato was taken from America to Europe in the sixteenth century. It was widely used in American countries, just as today the soybean is one of the mainstays in the Orient. It was apparent that the potato could be of great value in alleviating the famines which invariably followed crop failures in Europe, as now it is recognized that the soybean can contribute much to our protein needs in times of meat scarcity or prohibitive prices.

Techniques to hasten the acceptance of the potato were many and varied, as were the tales concerning them. The London Royal Society advocated cultivation of the potato to prevent starvation in times of crop failure. This brought little success. German preachers delivered sermons on the "lowly tuber," with the result that a group of these men were called "potato preachers." These efforts also were ineffective. People believed that potatoes poisoned the ground and caused diarrhea; they preferred to starve rather than to run the risk of using them.

The prestige appeal was also tried. In France an effort was made to secure acceptance by way of royal approval. Potato blossoms were worn by Louis XVI in his lapel and by Marie Antoinette in her hair. These methods failed for the common people but the landed gentry grew potatoes in their gardens.

The "forbidden fruit technique," cleverly planned by a French apothecary, brought a measure of success. By way of suggesting the use of potatoes to the poorer people, he is reported to have proclaimed loudly in the streets that the pillaging of the barons' gardens for potatoes was a punishable offense. The story goes that the pillaging promptly began, and it was not long until the gardens of the poorer people contained potatoes.

Of the various procedures used for introducing the potato, group feeding was the most successful. Count Rumford, a military adviser to the Elector of Bavaria, devised the plan of making every soldier of the Elector's forces plant a patch of potatoes, care for it, and eat the potatoes. Since the duration of military service in those days was fairly long, the men had time to develop a taste for them. After the soldiers returned to their homes, potato crops appeared all over the country, and the people of Europe gained greater insurance against famine.

This technique of introducing new foods through mass feeding is

being followed in India in a project initiated by the Women's Food Council of India through the establishment of cafeterias. This project is designed, in part at least, to encourage the people to consume a variety of cereal foods.

Group feeding today offers one of the best opportunities to promote better food habits in the United States. An estimated 20 per cent of the meals are taken outside of the home. Public eating places, the school lunch, the college dining hall, and the army mess are focal points for the improvement of our food habits.

The results of educational programs in nutrition have not been proportional to the efforts expended. The field of nutrition has much to offer for the improvement of mankind. There is enough knowledge now available to produce a superior race of people if we will only put it into practice. Application, however, lags far behind the progress of the science.

At this point the evaluation of methods may be as important as accumulating knowledge. According to Stone (1), we need to "sharpen our tools." Writing on the subject of how to get the most out of health education tools, he said, in effect: First, know what you want to teach. Second, whom you wish to reach. Then, "Light a fire . . . build a bridge. . . get down to cases . . . ask for action." In other words, create an interest, and bridge the gap from interest to goal. Illustrate with actual cases. Don't leave your public saying, "So what!" Ask for action in clear, certain, definite terms.

Why haven't calls for action in nutrition education been successful in the past? Possibly one reason is that the action has been too difficult. People have been expected to change their food practices completely, even when such change is unnecessary. Adequate dietaries can be achieved, for many people, with only a few changes. True, these may be the ones that meet with the most resistance, but concentration on the foods most likely to be missing in dietaries may bring more satisfactory results than teaching has produced in the past.

EMPHASIS ON NEGLECTED FOODS

Nutrition education in the past has been too general, according to Pett (2). He stated that it has consisted of a "shotgun" or "blunderbuss" approach; that we have dealt too much in national averages and too little with individual situations. It is wrong to suppose that everyone must drink more milk, just because the national average needs to be increased. We need a new viewpoint, a new method of attack. This new method must be an individual approach based on a definite knowledge of conditions in homes and the community, and carried into effect by individuals in the community.

Ideally the approach described by Pett is based on nutritional appraisal of the specific group involved. This step will take the guesswork out of the problem to be faced. Although methods for nutritional appraisal are not as yet infallible, we have had in the last ten years an accumulation of information as described in Chapter Two. This information suggests the scope of the problems with school children and the points of emphasis for the general population. But every teacher should study his or her own group in order to ascertain their particular problems.

The Iowa studies have revealed that food groups most likely to be inadequately represented in children's diets are: milk and milk products, green and yellow vegetables, vitamin C-rich foods, and eggs. Since many diets would be satisfactory if these foods were adequately represented, probably the most effective teaching will aim to increase the acceptance and use of these neglected foods. The importance of the other food groups will be evident when meals are planned and evaluated.

METHODS TO DETERMINE THE FOOD PRACTICES OF STUDENTS

Several methods may be used to discover and evaluate the food practices of students. The 3- to 7-day record of all foods eaten gives some information. Methods of evaluation will depend on the maturity of the student and the use to be made of the information. Some ways suggested are to:

1. Calculate the nutritive value by the simple short method devised by Miriam Lowenberg *et al.* (3).
2. Use a score card, such as that shown in Appendix D, pages 188-92.
3. Examine the record qualitatively for the use of certain food groups in specified units: e.g., 3 cups milk daily; one serving meat, poultry, fish; one serving green and yellow vegetables. A simple classification of foods in groups is suggested in the daily food guide for school children shown on page 35. For identification of foods in groups, see Appendix A, pages 173-75.

Incomplete but valuable information may be secured by observing the selections of food by people in public eating places. School lunchroom selections of food prepared in various ways and plate waste will indicate which foods are well accepted among those served. This information can be particularly valuable if it is compared with data from check sheets that indicate the food likes and dislikes of students. Observations in eating places frequented by students will give similar information, especially about between-meal snacks.

Parents, too, may provide information regarding foods eaten by their children. But Rodewald (4) found that mothers' reports of



Study food habits with the idea of learning.

foods eaten agreed more closely with dietary records kept by their sons than by their daughters. The girls tended to report better dieteries than their mothers' reports indicated. It helps us to know from the parents what foods are served at home during the same period that the students report their dieteries. A food may be missing on a student's list because of refusal to eat it, or because it was not served to him. The first reason would call for different education than would the second one.

IMPORTANCE OF KNOWING FAMILY FOOD PRACTICES

Efforts to change food habits of people should be accompanied by certain precautions. Due respect must be given habits and customs that do not conform to our standards, if they have resulted in a healthy people. There are many gaps in our present-day knowledge of the constituents of the perfect diet. Studies of the food habits of any group of people should be approached with the idea of learning as well as reforming.

It is also important to remember that food habits are complex. Few foods are consumed as isolated units. Our diets are full of food combinations such as bread and butter; meat, potatoes and gravy; cake and ice cream; sugar and cream with coffee. The intake of any food is likely to influence the intake of other foods.

Dickins (5) has said, "... a given diet is an intricate, interrelated combination of foods in which an increase or decrease in the consumption of any one element not only affects the balance of the diet in terms of the contributions made by that particular food, but may also increase or decrease the consumption of related foods." Observations of the effects of a white corn meal shortage in the diets of Mississippi children illustrated her point. With the customary cornbread made of white meal, the children liked greens, buttermilk, beans, and peas. With biscuits they preferred such foods as sirup and gravy. Interestingly enough, with yellow corn meal, they preferred the foods desired

with biscuits, namely, sirup and gravy. The ultimate benefits derived from the substitution of yellow corn meal for white were therefore questionable.

Such dangers would be minimized if emphases of education were on the importance of nutritionally adequate diets rather than on conformity to standard rules for menu planning. If this emphasis were given to teaching, foreign dishes would not be treated as novelties to be featured only at Christmastime or for entertaining. Rather, people would be taught ways of using available foods in preparing such dishes for the enjoyment of family members who like foreign dishes or unusual combinations. Furthermore, national dishes that contain fruits, vegetables, eggs, and milk in abundance would be featured in exhibits, demonstrations, or articles as well as dishes made largely of cereal products and sugar.

Most teachers belong to the middle class and believe that they should teach their students the social and food practices which they were taught, even when most of their students come from homes where these practices are strange. Such a belief has led to frustration in many instances because teachers have found that even though students may seem interested in what is being taught, practices at home are not changed.

Results of an exploratory study in a Michigan school are worthy of consideration by teachers. When Hurt (6) studied the attitudes of some ninth-grade girls and their mothers, she found that teaching a unit, "Helping With the Family Meals," was most effective when keyed to customary practices of the families. Girls in three ninth-grade homemaking classes were from families ranked in the lower-middle or lower-class social groups and were taught by the same teacher. In one class the values and practices of middle-class families, usually found in textbooks, were emphasized. In a second class, both lower- and middle-class practices were taught. In a third group, teaching was keyed to lower-class values and practices and included only a few middle-class practices. More students in the second and third groups than in the first group seemed to like what they studied. They said that what they had learned was practical for their homes. The mothers of the students agreed with their daughters.

The results of Hurt's study are not surprising when you consider how much easier it was to understand what was being taught when the teaching agreed with home practices. Likewise, it was easier for the family members to accept the foods that were not completely unfamiliar to them. There is reason enough why many people are confused when they are introduced to unfamiliar foods, cooked in strange equipment, combined in an unfamiliar meal pattern, and served in a

manner that seems formal and strange. The family, too, may not appreciate attempts of the teacher to change practices that are as personal as those related to food. This is especially true when the most obvious basis for a proposed change is social custom.

NUTRITION EDUCATION MUST HAVE MEANING FOR STUDENTS

Students can interpret new experiences only in terms of their own past experiences, either actual or vicarious. This is another reason why modification of a family's customary dietary pattern is likely to be more effective than attempts to impose a new one. Communication and understanding are easier when students know the meanings of words used by the teacher. If she believes that meaningful experiences are important, she will be alert to provide experiences that result in common understanding of words.

One basis for misunderstanding may be the different interpretations of nutritional status. Nutrition education may have little meaning to people who are unaware of the characteristics of a well-nourished individual. Words are quite inadequate for describing a boy or girl with good nutritional status. At least a picture of a well-nourished person must be seen (as in Fig. 1.1, Chap. 1) if words describing him are to mean the same to both teacher and student. One teacher was able to make an impressive collection of pictures of people with either good or poor nutrition from newspapers, magazines, and photographs of friends and their families.

YOU CAN MOTIVATE CHANGES IN PRACTICES

Food practices do not change just because people have accurate, meaningful facts. Motivation to use their knowledge in daily living is necessary. The over-all objective of nutrition education is to establish food practices that are nutritionally sound. To accomplish this objective people must desire to make any necessary modification in their meals and snacks.

Learning is likely to be effective when the relationships between the food eaten and the goals important to students are recognized and accepted by them. Most adolescents have as goals: maintaining an attractive personal appearance, making friends, and having enough pep to participate in work or social activities. When nutrition education makes clear the relationship between these goals and the food an individual eats, people are likely to be motivated to learn how to achieve good nutritional status. In Chapter Four you noticed that facts of nutrition were organized so that they could be used to motivate learning. The usual interests and concerns of people were used as a basis for organizing the subject matter.

Not all people can be motivated to improve nutritional status by appealing to the same interests. Because the interests of adolescent boys may be different from those of girls, you will wish to appeal to them in different ways. For example, the knowledge that food can build big strong bodies may motivate a group of boys to eat enough of the important foods. But as a group, girls are not anxious to have large bodies. Unless the teacher points out that physical health also means beauty of skin, hair, nails, and so forth, the girls in her group probably will not be interested in changing their food practices. The generalizations in Chapter Four will help you motivate learning of girls and women as well as boys and men.

DESIRE FOR INDEPENDENCE AS MOTIVATION

Eating as one wishes may be a symbol of personal independence even in infancy. Sweeney (7) discussed the importance of capitalizing upon the desire of individuals for independence by helping them make free choices of food in a wise way. She wrote about the importance of:

... setting up situations in which responsible choice can replace either the slavish acceptance of a traditional diet or the equally slavish refusal to accept it in order to appear independent.

At what age should a boy or girl be expected to take responsibility for choice of food? The exact age varies somewhat with individuals but probably adults attempt to use authority long after this method is neither effective nor desirable with children. In fact, failure to teach children how to make decisions about a problem as vital as food may actually delay development of the ability to assume other responsibilities.

Some children prefer the security of doing what a so-called "authority" dictates. The wisdom of such a method of securing adequate food is questionable as preparation for living in a rapidly changing world. Blindly following rules for good nutrition may not provide adequate preparation for adjusting to advances in the science of nutrition and in food technology. The person without ability to make intelligent decisions about food may be helpless when faced with half-truths about new forms of food, sometimes presented in advertisements or in articles by unscrupulous or misinformed persons.

The goals of people change somewhat as they grow from childhood to adulthood and, therefore, education that has been effective at one time may not motivate a change in behavior at a later stage of development. As the goals of individuals or groups change, so will the problems they recognize as important to solve. The teacher who

can use some of these important problems as a basis for teaching is likely to be most satisfied with the results of her efforts.

When an individual desires to learn how to improve his nutrition, teaching is relatively simple. Then he is ready to learn the facts and to organize them so that the resulting generalizations can be applied when planning food for either himself or his family.

WAYS YOU CAN TEACH STUDENTS TO GENERALIZE

The amount of help that your class or audience will need in order to formulate generalizations will depend upon their intelligence and past experiences in generalizing. People of high intelligence seem able to generalize with little guidance but the majority of people must develop this ability.

The first step in teaching students to generalize is to plan situations in which the facts you wish to present can be pointed out. For example, if your class knows little about the characteristics of good nutritional status and you wish to guide them in generalizing, you will not depend upon words to describe these characteristics. You will present to your audience pictures that illustrate what you wish to show if actual people are not available (Fig. 5.1). The extent to which these illustrations should include people of different ages and body build will be determined by the generalizations that you expect your audience to formulate. If you are teaching boys and girls, you will probably limit your illustrations to children of comparable age with different body builds. An adult audience would probably be interested in all age groups especially if parents were included.

The next step in guiding people when formulating generalizations is to point out similarities and differences among the factors in a situation. When similarities and differences in the characteristics of the girls shown on the following page are evident to students, they have bases for drawing conclusions about the relation of nutrition to personal appearance. If time is taken for students to state conclusions in complete sentences, you can discover any mistaken ideas and reteach to correct them. Conclusions should be tentative because valid generalizations are not usually formulated from a single experience.

Additional experiences in discovering and organizing the same facts are necessary before students should be encouraged to accept their tentative generalizations. Observation of films and reading are examples of experiences that may be used to validate generalizations (see Appendix E). Guidance for these experiences will be much like that needed for the tentative generalizations.

Many experiences in applying these generalizations to real life situations will clarify them and develop ability to use them. Such ex-

CHARACTERISTICS OF GOOD NUTRITION

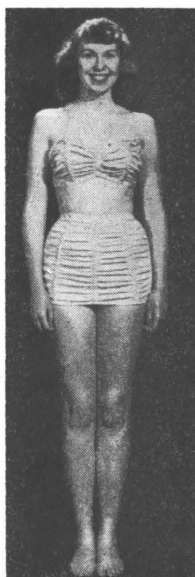


FIG. 5.1A

Shiny, luxuriant hair

Sparkling eyes

Well-formed teeth

Square shoulders

Straight spine

Alert posture

High vitality

Firm muscles

Proper weight for height and age

Straight legs

Well-arched feet

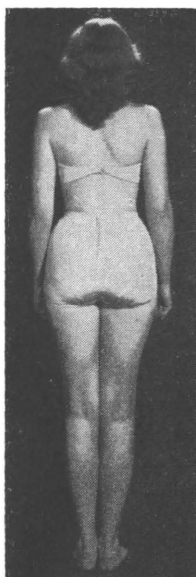


FIG. 5.1B

CHARACTERISTICS OF POOR NUTRITION

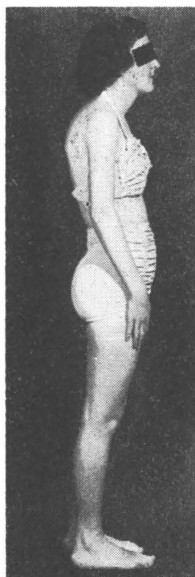


FIG. 5.1C

Dull hair

Narrow, round shoulders

Curved spine

Sagging, poor posture

Low vitality

Poor muscle tone

Underweight for
height and age

Slightly knock-kneed

Flat feet

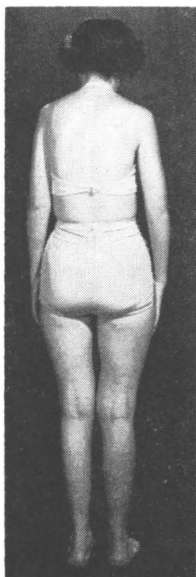


FIG. 5.1D

periences will prepare the students to use what they have learned whenever it is needed.

When teaching a class of seventh-grade boys and girls, Helen Barbour (8) used these steps to guide her students in generalizing. Her lesson plan for teaching the effects of food upon growth is reproduced to illustrate one way of teaching generalizations.

LESSON PLAN TO ILLUSTRATE DEVELOPMENT OF GENERALIZATIONS

Objectives:

When students have completed this lesson, they will be better able to:

1. Recognize how food affects growth of the body.
2. Attain good nutrition because they select foods which provide nutrients in amounts needed by their bodies.
3. Distribute foods wisely in meals and snacks.
4. Maintain the body in a condition favorable for utilization of nutrients.

Generalizations for Teacher Reference:

Generalizations 1E (1-13), page 48, and 5A (2-3), page 56, were used when planning.

Class Discussion:

1. What is normal growth ?
 - a. Inherited qualities — can they be changed? If so, how?
 - b. Individuality in rate of growth (rate of growth of girls vs. boys)
 - c. Environmental factors affecting growth rate (food, rest, sunshine, exercise, fresh air, worry and unhappiness, etc.)
 - d. Illness and infections (bad tonsils, poor teeth, rheumatic fever, etc.)
 - e. Height-weight-age tables — how are they used? What does it mean if you are not the weight the tables indicate for your age? (Use weight and height records of pupils.)
2. What influences your height, weight, and body build ?
 - a. Appetite
 - 1) Regular meals
 - 2) Kind of foods in the meals (satiety value)
 - a) Protein, fat, and sweets slow down hunger contractions
 - b) Fruits, vegetables, and cereals (without fat) leave the stomach quickly
 - 3) Snacks — if properly selected may not ruin appetite for the next meal

- 4) Exercise, fresh air, rest (enough to allow food eaten to be used well), and sleep help build good appetites
- b. Amount and kinds of food that help you gain weight
- c. Amount and kinds of food that help you lose weight
- d. Need for building materials in either a diet to gain or lose weight (milk, fruit and vegetables, meat, eggs, whole grain or enriched bread and cereals, butter or margarine)

Summary by Students:

You will be given 5 minutes to write sentences that tell what you have learned today. These questions will help you.

1. What influences the way you grow?
2. What affects your appetite, or lack of it?
3. What foods can help you to gain weight?
4. What foods should be reduced in amount to lose weight?
5. What foods do you need whether you are gaining or losing weight?
6. Why is underweight, or overweight, undesirable?

Students will need help in stating generalizations. In the lesson plan, questions that emphasized the ideas presented were suggested to guide students. In an earlier lesson students were encouraged to give reasons why new facts or ideas were important or interesting. Another suggestion was that sentences begin with "if," "because," or "when." Thus, they were encouraged to make complete sentences in their own words to express the ideas that they had gained.

Students of all ages have a tendency to form generalizations only partially supported by facts. Their statements may be strong, positive ones needing considerable qualification. This may be due to incomplete information or unquestioning acceptance of material presented either by the teacher or in references. You can teach students to be critical of their conclusions and thus to generalize more accurately.

Learning to apply generalizations is another aspect of thinking that is not easy. You are teaching nutrition with the hope that food practices of students will improve and so you will want to teach students to use the generalizations they have learned, when deciding what they will eat. Students in college as well as elementary grades often wish to discuss personal problems that might be solved by applying the generalizations they are learning. If you take time in class to encourage application, students may not know as many generalizations but those they do know will be more meaningful.

When helping students to learn facts and ideas and to generalize them, it is helpful to:

1. Present a few important ideas and stress these throughout the

class. Relate any details to the main ideas and facts which are to be emphasized.

2. Write important facts on the blackboard and draw attention to them from time to time during the class.
3. Use demonstrations, charts, graphs, films, and other visual aids whenever possible to point out facts, to illustrate how they are related, or to show situations in which they may be applied.
4. Summarize the important ideas. You may do the summarizing, or you may have students state generalizations if time permits.
5. Apply the generalizations to situations with which the student is familiar.
6. Ask questions which require the application of the generalizations in order to answer them.

The use of generalizations does not stand out as a method in itself but should be a part of all classroom experiences. Thus the methods described later in this chapter are not complete unless students learn to draw conclusions from their experiences and to state their conclusions as generalizations.

THE USE OF DISCUSSION-DECISION METHODS

What difference does it make whether you *tell* students to do thus-and-so or let them *decide* what to do themselves? Apparently there is a world of difference. Research shows that encouraging a group to decide upon certain goals will achieve better results in education than giving them a lecture.

To break down resistance to change in food habits, Lewin (9) developed a method which lies halfway between an individual and a mass approach. He suggested a group decision method, which is much more than merely group discussion. (In group discussion a free interchange of ideas takes place; the initiative lies with the group. No attempt is made to reach a decision. But a discussion-decision method leads to setting up definite goals of action either for the group as a whole or for each individual in the group.)

The first experiment by Lewin and Willerman (10) compared the group decision method with a request method, in attempting to increase the consumption of whole-wheat bread as compared with white bread in eight cooperative dormitories for men at the State University of Iowa. Each *request group* was asked to change its consumption of whole-wheat bread the same amount as the amount which had been voluntarily chosen by a *decision group* with which it was paired.

Reaction to the proposal of participating in the experiment, eagerness of the students to reach their goal, and even their relative preference for whole-wheat bread depended upon the degree to which the

decision was made by a majority. The *decision groups*, that set their goals at 66 per cent to 90 per cent increase in consumption of whole-wheat bread, reached their goals, whereas the *request groups* paired with them did not.

Radke and Klisurich (11), encouraged by the success of Lewin's studies, carried out two experiments designed to compare effectiveness of lecture versus discussion-decision techniques. The degree of change and the permanence of the new behavior were considered.

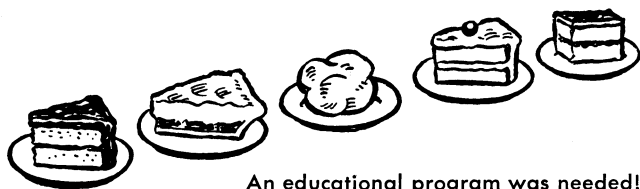
Their first experiment dealt with infant feeding. Half of the mothers of newborn babies in the maternity ward of a hospital received individual instruction from the dietitian, and were given a printed schedule to follow in feeding their babies at home. The other half of the mothers met with the dietitian in groups of six. In the meetings, which took as much time as the individual conferences, the dietitian played the role of both expert and leader. The problem of getting mothers to follow instructions given at the hospital was discussed, and the new mothers were asked to suggest better methods of accomplishing this. The discussion gave the mothers a chance to exchange ideas and ask questions.

The leader summarized the discussion, gave her own instructions, and then inquired about their willingness to carry out dietary instructions. The group decided to follow the instructions of the dietitian.

The dietitian made telephone calls 2 and 4 weeks after the group meetings to check the performance of the mothers. How well directions had been followed was estimated by the amount of orange juice and cod-liver oil given the babies, because these amounts had been carefully specified. In the *decision group*, 75 per cent of the mothers were giving orange juice in correct amounts at 2 weeks, and 100 per cent after 4 weeks. After *individual instruction*, 44 per cent were giving orange juice at 2 weeks, and 88 per cent at 4 weeks. In the *decision group*, 44 per cent were giving the correct amount of cod-liver oil after 2 weeks, and 88 per cent after 4 weeks. Among the mothers receiving the *individual instruction*, 18 per cent were giving cod-liver oil after 2 weeks and 53 per cent after 4 weeks. Apparently the 2- and 4-week checkups served as a stimulus for improvement in the following of directions. At both 2 and 4 weeks the decision group had done better than the group receiving individual instruction.

A second experiment conducted by Radke and Klisurich (11) involved a comparison of lecture and discussion-decision methods in increasing milk consumption of homemakers of low-income level. The results of this experiment also showed the success of the discussion-decision method.

Radke and Caso (12) applied the discussion-decision technique in a study undertaken at the request of the Student Council of the Weeks



An educational program was needed!

Junior High School, Newton, Massachusetts. The Council asked the Nutrition Center, a community agency supported by the City Health Department, the Community Chest, and the local Red Cross Chapter, to assist in a survey of the lunches selected by the students in the school cafeteria. The desirability of an educational program to follow the survey became evident. As a result, a study was made to test the effectiveness of lecture and discussion-decision methods for influencing the students to improve their school lunch habits.

Approximately 850 sixth-, seventh-, and eighth-grade students participated. Twelve homerooms were assigned to lecture, and twelve to discussion-decision treatment. Eight nutritionists served as group leaders, each having an equal number of lectures and discussion-decision meetings. Each group met for approximately half an hour either before or after lunch.

In the lecture groups, the nutritionist held discussion from the group to a minimum. She presented facts on nutrition and related them to the food habits of the students in the school cafeteria.

Students in the discussion-decision group were encouraged by their leader to contribute ideas. They were led to feel that they were responsible for helping themselves to overcome obstacles in the way of a good diet. Though a goal for personal action was suggested by the leader, the group in each case accepted it and gave some kind of voluntary, unsolicited group expression of commitment. The nutritionist suggested that the commitment be voted upon, with a show of hands. The decision was that each person would include foods from three basic-food groups in his lunch each day. Each person had evidence that the others were "going along" on the decision.

All the students filled out questionnaires about the lunches eaten at school; one questionnaire preceded the meeting and four were given afterward. Through the questionnaires the percentage of students who chose an adequate lunch was determined.

At each testing, the *lecture* and *discussion-decision* groups were compared with a *control group* which had had no nutrition teaching. The three groups did not differ materially on the first questionnaire in the percentage of students reporting adequate lunches. Therefore

it was possible to assume the groups to be roughly equivalent. Each later test showed an increase in the number of students in both the *lecture and discussion-decision groups* choosing adequate lunches as compared with the *control group*. The improvement was maintained or further increased by the *discussion-decision group* on Questionnaires 4 and 5. However, the *lecture group* fell to the level of the *control group*. These results indicate that motivation for eating a balanced lunch was set up by both the *lecture* and *discussion-decision* methods. The *lecture* had only a temporary effect in improving school lunches. Students in the *discussion-decision group* made a more stable improvement.

The discussion-decision technique may be effective partly because it permits the group member to define his own goals in relation to the question discussed as well as to receive support from the knowledge that fellow group members are faced with problems closely akin to his own.

Discussion is one way to stimulate students' thinking but sometimes it is difficult to guide unless there is a situation on which to focus attention. You and your students can observe and consider a situation together when it is presented in a *film, field trip, role playing, in a case study, or on radio or television*. Each of these methods is discussed in detail.

USING FILMS IN TEACHING NUTRITION

Films can be valuable aids to you in teaching nutrition. They effectively provide students with a common vicarious experience. It is difficult to duplicate the lifelike situations portrayed in a film by any other method. Time and space can be telescoped so that students view either the effects of time or situations that cannot be seen in person. For example, in *Fundamentals of Diet* (13) the growth of plants and animals, that requires months in nature, is shown in a matter of seconds in the film. In another film, *For Health and Happiness* (14), many children of different body types are shown. A comparable group of children would be difficult to observe in most communities because they would not be assembled in one place and might not be dressed so that the characteristics of good nutritional status would be evident.

Movies are most often seen for entertainment, and therefore films are eagerly anticipated by students. In this receptive frame of mind, people can be interested and informed. Films used for education should be informative, but not ponderously dull, lest you spoil anticipation for future ones.

Students may not understand the point even when they are interested by the film. Only when their observation is directed can you

be sure that students will remember the ideas for which the film was shown.

Because good films are made for more than one educational situation, and would not be as useful if oversimplified, you should guide your particular class to their own understanding of the film. Ask questions to focus attention on the aspects of the situation the students should observe, and thus you will simplify the film for them.

Furthermore, by emphasizing some aspects of a film and ignoring others, you can use the same film for different sequences of learning. The questions that you give to students before they view a film will tend to influence what they see and hear and what they discuss following the film. You may use a certain film differently if your objectives for showing the film are different.

Your Questions Are Important

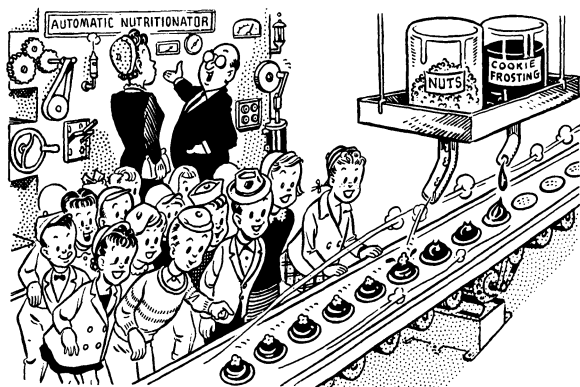
Questions should reflect your knowledge of what will motivate the students. Students learn what they believe will help them to achieve their goals. Knowing this, you can use questions to point out how the abilities, attitudes, knowledge, or practices presented in the film will influence the attainment of goals important to your students. An illustration of how teachers in one school used nutrition films can be found in Appendix E, pages 194–98.

In 1949, a workshop group at the University of Tennessee (15) proposed a plan for formulating questions to guide observation and discussion of educational films. This plan was used when the lesson plans in Appendix E were made. It has been useful when planning discussions of different types of films with different age groups. It includes six steps in formulating questions:

1. Question No. 1 calls for information clearly presented in the film.
2. Question No. 2 calls for an examination of ideas in other situations.
3. Question No. 3 encourages drawing inferences, identifying cause and effect relationships, or expressing own ideas.
4. Question No. 4 asks for examination of these ideas as they apply to present-day life or in the light of authority.
5. Question No. 5 asks students to formulate generalizations of their own, based on data from the film, from experience, and from opinions of authorities.
6. Question No. 6 asks students to illustrate the meaning of generalizations; to apply these ideas in everyday practice.

FIELD TRIPS

Much as films may serve to provide students with a common experience about food, field trips may be arranged to increase understanding and knowledge related to processing and distributing food.



Look at the trip through the children's eyes.

You may wish to arrange a visit to a food processing plant or wholesale firm. Call the person in charge and tell him exactly what you want your students to know after they have made their tour. If you will visit the plant first, you will be better able to decide what the trip should include. Avoid unpleasant experiences for your children. Look at the trip through their eyes. For instance, young children from the city may be unfavorably impressed by a visit to a dairy farm and therefore may drink less milk for a while, simply because they do not like the barn odors. Limits in time must also be considered, so talk over with your host the particular places and procedures the students will want to see. It goes without saying that you will arrange a definite time and day for the field trip in advance.

The class should know beforehand what to look for during the trip. You and your class can discuss points of interest together and select the most important highlights of the planned tour. The host will spend more time explaining certain procedures if he knows the students are interested, as evidenced by their questions to him.

It is well to keep groups small enough so that questions and explanations can be understood en route. It is better to ask questions of the teacher or the person acting as a guide than of individual workers at the plant. To interrupt workers may cause accidents or delay in the process being carried out.

Field trips, if properly planned in advance, may create much interest and help the student gain knowledge and understanding which can be obtained in no other way. Real-life situations help to give meaning to words used in the classroom.

Good public relations may be established through contacts with men and women who are active in businesses related to food and nutrition. Invite the host to visit your classroom before or after the tour. This is often appreciated and sometimes accepted. Then you can

interpret food and nutrition information and activities at school to these people in the community who might not otherwise learn about them.

Following the field trip it is profitable to have a class discussion of what has been seen and to point out principles and generalizations which are related to the experiences of the field trip.

ROLE-PLAYING IN GROUP DISCUSSION

Role-playing is another method of getting a situation before a group for discussion. For the actors, role-playing may be a moving experience; for the spectators, a concrete situation is portrayed that can be discussed objectively.

Role-playing is the spontaneous acting out of a situation by two or more members of a group. The situation portrays an experience of common concern and one that will further group discussion.

Assuming that the majority of boys and girls in a group do not consistently eat breakfast, the leader may use role-playing to start discussion, instead of a film as suggested earlier. The method would not be named but could be introduced naturally by suggesting that some members act out an early-morning scene in a home.

Group members can set the stage by naming the people in the cast and describing the situation. They can decide what kind of person each actor is to portray but will not tell him how to act. The situation should be described sufficiently to make the problem clear. Spontaneous reactions to the situation as it develops are necessary if roles are to be portrayed realistically.

Role-playing is not presenting a skit. The players may be given a short time to decide how the scene will open but they should not plan beyond this point. Under-planning by either the group or players is better than over-planning.

When the roles develop spontaneously, real emotions tend to be

Invite the host to visit your classroom . . .



expressed and attitudes revealed. When a boy assumes the role of a parent, he is more likely to understand the feelings of his father as he responds to behavior of a boy his own age.

Persons are most likely to be comfortable in roles in which they feel at home. For this reason asking for volunteers is probably the best practice. If individuals do not volunteer, group members can suggest someone for each role. When there is an unfavorable role, the leader may wish to assign it to someone who has enough status in the group to feel secure.

You will be responsible for deciding when the scene should be cut. As soon as the problem is clearly defined, you should stop the acting. There is a tendency to let the scene go on too long. When this happens, the players may have difficulty in carrying on, and the audience may become restless.

While discussing the situation portrayed, suggestions may be made for improving it. When this is done you may wish to have the scene replayed. This may be done by the same players, if they accept suggestions for making a new approach to the problem. If they cannot make changes naturally, new players may be selected to replay the original scene or one that may follow it.

If you use role-playing, you will have to "think on your feet" because you will not know exactly what will happen. You cannot formulate your questions as specifically ahead of time as you can with films. But your students may respond better because the situation is real to them.

Preparation of the audience for observation is desirable and can be made when the actors are out of the room. Questions can call attention to the way the situation is handled by each player or to the way the problem is solved. These questions should help to prepare the group for the discussion to follow.

The discussion should lead either to some conclusions or recognition of need for more study of a problem. Your questions will help the group evaluate the situation. You may ask questions that will help the group state generalizations similar to those in Chapter Four. This is most likely to happen if role-playing is used near the end of a lesson, when students have had enough experience to draw conclusions. The situation presented in role-playing may be used to introduce a lesson, in which case you may ask questions to help students decide what additional experiences they need.

CASE PROBLEMS IN GROUP DISCUSSION

One reason why films are effective in teaching is that situations are presented so that many factors influencing the actions of people are seen. Stories or case problems can serve the same purpose in teaching

and they have the advantage of being available when needed. In teaching nutrition, cases should provide such pertinent facts as individual and family customs and resources, nutritional state, and food practices of individuals about whom the group will be concerned.

Case problems can be used when introducing nutrition teaching to show the complexity of decisions regarding food, or you may wish to use a case problem when summarizing. Often a story can bring together previous learning that should have resulted from considering various factors separately.

Because there may be emotional blocks when people try to solve their own problems related to food, case problems can be a means of learning to arrive at decisions objectively. If problems are too personal, prejudices may interfere with thinking so that individuals are either not able or not willing to consider all possibilities when seeking a solution to a problem.

For example, girls who do not eat breakfast on school days may be willing to consider what Joan should do, even though they are on the defensive when considering their own situation. Joan is a ninth-grade girl who is slightly overweight. She is popular with her classmates. However, she is often irritable and listless in the late morning and early afternoon. She is always well groomed and attractively dressed. Her mother prepares a breakfast of tomato juice, cereal, and coffee or milk and urges her children to eat it. Joan says that she has time for only a cup of coffee and that eating breakfast makes her sick.

When discussing this case, a teacher might ask such questions as:

1. Is Joan wise to go to school without breakfast?
 - a. Is skipping breakfast a good way to reduce weight?
 - b. Is there any relationship between going without breakfast and feelings of fatigue or irritation?
2. What might Joan have for breakfast that would be more appealing to her than tomato juice and cereal?
3. What reasons might a girl have for going without breakfast, other than reducing calories?

The case of Joan would be useful only with a group of girls in which there were several who did not eat breakfast. Case situations should present problems that are recognized as important to the group. Thus the problems are real enough to be interesting, and the learning is likely to be applied. When preparing for leading a discussion of this case problem you will find helpful the generalizations in Chapter Four.

USE OF RADIO AND TELEVISION

Radio and television programs may be sources of case studies that are interesting to students. Family situations are a popular type of

program and may provide opportunities for you to capitalize on the current interests of the group.

When programs are given by a competent staff, the information is likely to be both reliable and up to date. For this reason you, as teachers, may find that the effort needed to locate and listen to educational broadcasts is well spent because you will gain knowledge yourselves, or you may be able to arrange for members of a group to get first-hand information from them.

Undoubtedly, advertisements on radio and television influence the food practices of people. Many commercials are cleverly presented; persons responsible for them know how to appeal to emotions as well as to reason. In fact, some discourage the use of reason!

Older students and adults can be encouraged to evaluate the appeals made to them. Such evaluations require applying facts of motivation as well as recognizing the various ways in which advertisers make their appeal.

When students have opportunities to give a radio or television program, they are likely to be strongly motivated to learn what is needed to do a good job. If you have enough advance notice to allow students to plan and prepare a program, they will be motivated to learn how to organize and present needed facts, to develop needed skills, and to cooperate in a group project.

Students will probably be interested in making careful preparation when they know that they will reach a large audience and will have no opportunities to correct mistakes or to make additional explanations if ideas are not clear. Time limitations, too, encourage detailed planning.

ANALYSIS OF PROPAGANDA

Means of communication today make it possible for information about food and its uses to confront the public at every turn. Newspapers and magazines make numerous claims for food products and use glamorous colored advertisements to encourage their purchase and use. Television screens are filled with clever quips and gimmicks to draw attention to special qualities of products. Sometimes the first tune a young child learns to sing is a jingle used to advertise a food product. Radio also contributes its share of claims and information about certain items of food.

It becomes urgent that the people receive help in how to evaluate these claims made by the food industry. To do this the following criteria may prove useful to the teacher of food and nutrition.

1. Where was the claim made? Newspaper, radio, television, magazine, billboard, etc.?
2. Was it made by a "self-interested" party?

3. Was any scientific source of the information mentioned?
4. Did the statements seem sensational or extravagant?
5. Are there any experiments, or other type of reliable evidence, to support the claim?
6. Are the statements misleading or in the category of half-truths?
7. What questions do the claims or statements raise in your mind?

Information coming from experiment station bulletins, United States Department of Agriculture pamphlets, county home demonstration agents, or from staff members of recognized colleges and universities can be accepted as sound information. Statements which conform to the policies of the Council on Food and Nutrition of the American Medical Association and the Food and Nutrition Board of the National Research Council are considered valid.

A newspaper or magazine article is only as good as the person who wrote the article. If the author is not known, information should be checked to verify its accuracy.

Clever advertising sometimes appeals to the public when the principle or generalization involved is not sound. People, both young and old, need help in evaluating the advertising schemes related to food and nutrition.

Frequently a food industry presents an appetite-appealing piece of propaganda in magazines, radio, or television which increases the sale of their product immensely. However, the information given about the product may not be of great importance in regard to nutrient or economic value.

Another way in which food advertising can mislead the consumer is to tell only a part of the function of the food product. No false claims are made, but only a fraction of the possible facts is given.

Teachers can help students and adults evaluate advertising propaganda if they give them reliable sources of information, and ways to judge the worth of seals or other evidence of approval, and develop their judgment in the applications of facts and generalizations related to food and nutrition. The development of a critical attitude toward the acceptance of any claims related to food practices is urgent.

ANIMAL FEEDING EXPERIMENTS

Often experiences with concrete things are needed to give meaning to the abstract ideas expressed in nutrition generalizations. Animal feeding experiments and preparation of food at school are two such experiences. When these are student projects, students not only learn about nutrition but also they learn to take responsibility and to work together.

Animal feeding experiments can show living evidence that foods work together to promote growth and health. The "Basic Seven"

Food Guide (see pages 173-75) is considered a practical plan to simplify nutrition and make it feasible in application. Yet many times students do not see the importance of the "Basic Seven" until they are shown what makes it work and what is behind it.

Those who are trained in nutrition know well that the "Basic Seven" Food Guide works because of the supplementation among the essential nutrients in these basic foods. Thus the group of foods containing meat, poultry, and fish provides a good protein base for the daily diet; the milk ensures an adequate supply of calcium; the group of foods containing citrus fruits, melons, and raw green vegetables supplies a large amount of vitamin C; and the green and yellow vegetables afford large amounts of carotene which is at least partially utilized by the body as vitamin A. Properly supplemented with other vegetables and fruits, cereals, fats, and sweets, the resulting diet will likely be adequate in food energy and the needed nutrients.

For a majority of students seeing is believing, and relatively simple feeding experiments with weanling-age rats can be used to demonstrate supplementary relations between two basic foods. Feeding experiments can be arranged in a series which increases in complexity as the interests and abilities of adults and children permit.

Students like projects in which they can participate. When they plan the diets, feed and care for the animals, and keep records of their growth, the results are remembered longer. They also learn as they tell others about the experiments.

Animal feeding experiments may be projects in which several classes participate. Younger pupils may learn only basic health rules or may simply watch animals grow week by week. Older students may make wider applications from their observations. Teamwork and a cooperative spirit are developed through participation of several different classes. The entire project becomes important in the eyes of the children.

You may wish to plan a rat-feeding experiment to demonstrate the need for foods that are missing in the diets of your students.¹ Such an experiment was part of teaching in several schools in Iowa. All rats were fed a basic diet consisting of navy beans, potatoes, rolled oats, white flour, sugar, salt, butter, and lard.

When meat is added to this diet, you will see that a bread, meat, potato, and dessert diet is represented. This is the type of diet eaten most of the time by many students. The second rat was fed the same diet with milk and eggs added.

¹ For directions for preparing the diets and caring for the rats see Appendix F, pages 199-202.

The diet of the third rat was the same as the second except that green lettuce, spinach leaf, or carrot was added. This third diet contains all of the essential food nutrients except vitamin C. This nutrient is not essential in the diets of rats because they can make vitamin C in their bodies if their diet is adequate in other respects. When explaining why this nutrient is not needed in the diet by rats, you will have an opportunity to emphasize the fact that nutritional needs of rats are similar to those of human beings in many respects.

Foods used to supplement the basic diet are served separately. The meat (lean hamburger) may be fed in marble-sized balls once every other day. The milk (dried) should be fed in servings of one tablespoon every day. The egg should be hard cooked and mashed immediately while hot. One egg will make about three feedings. A rat will eat about one-third of a carrot or a 2-inch square of lettuce in two days.

If you guide students' observations, you can help them formulate generalizations such as: Nutrition can affect the way you look and act. You can call attention to the appearance and actions of the rats, and then again point out that nutrients are as important to boys and girls as to rats.

To call attention to the characteristics of each rat you might ask such questions as:

1. Which rat has gained the most?
2. Which rat has the nicest fur?
3. Which rat has the brightest eyes?
4. Which rat is best looking now?
5. Which rat is the friendliest?
6. Which rat seems to be the healthiest?
7. Which kind of posture does each rat have? (A healthy rat keeps its body close to the floor when walking; a sick one may be hunched or stiff.)
8. What made one rat healthier than the others?
9. What foods should we eat every day?

You will find that this experiment is interesting to adults as well as children. Reports of the experiment are a means of reaching parents with nutrition education. Adults may be invited to school, or a parent-teacher program can provide an opportunity to hear students tell about the experiment. The rats will illustrate results, but growth charts help to interpret them. A display of foods eaten by each rat will emphasize the importance of milk, eggs, and green and yellow vegetables.

Another way to reach parents and other adults would be to exhibit animals from an experiment, or pictures of them, in a local store

window with the sign "Food Made the Difference." This method will probably not teach as much about the experiment as does the demonstration with reports, but it may reach more people.

Rat-feeding experiments have been found useful in teaching students of various ages. When the same students are taught with rat-feeding experiments in more than one grade, you will wish to vary the experiment. A plan used by Booher (16) is suggested.

Dr. Booher has devised three successive series of experiments with eighteen weanling, male albino rats grouped so that the combined weight of the six animals, composing each of three groups, was comparable. The purposes of these studies and the data for each group are shown in the following experiments:

EXPERIMENT A. To develop the generalization: *breakfast cereals and milk are supplementary foods.*

Group 1. Unrestricted amounts of a finely ground mixture of equal weights of 19 breakfast foods (whole grain, enriched, or restored).

Group 2. Unrestricted amounts of homogenized vitamin D milk.

Group 3. Unrestricted amounts of both the finely ground cereal mixture and homogenized vitamin D milk.

EXPERIMENT B. To develop the generalization: *sugar and pure starch are inadequate supplements for milk.*

Group 1. Unrestricted amounts of a finely ground mixture of equal weights of 20 breakfast cereals combined with milk in the proportion of 1 ounce of mixed cereals to 4 fluid ounces of fresh whole milk.

Group 2. Unrestricted amounts of cane sugar and milk in the proportions of 1 ounce of sugar to 4 fluid ounces of whole milk.

Group 3. Unrestricted amounts of cornstarch and powdered whole milk combined in the proportions of 1 ounce of starch to 0.5 ounce of powdered milk mixed with water.

Group 4. The same diet as Group 3 with cornstarch replaced by the mixture of 20 breakfast cereals.

EXPERIMENT C. To develop generalizations similar to 6 C (6), page 64.

Following the same technical details as in Experiments A and B, diets consisting of a mixture of equal weights of 33 breakfast cereals combined with six different proportions of fresh whole milk were fed to six groups of weanling-age rats over a six-weeks period. The objective was to determine, within practical limits, the proportion of average breakfast cereal to milk representing the best nutritive combination of these two foods. The proportions of mixed breakfast

cereals to milk ranged from 1 ounce of cereal per fluid ounce of milk to one ounce of cereal for approximately 30 fluid ounces of milk.

Some deductions from an experiment such as the one conducted by Dr. Booher can be drawn by observing:

1. The relative value of a given combination of basic foods in promoting over-all growth and development as compared with any food alone.
2. The effects of replacing one of the two basic foods in the combination selected by food products which contribute only accidental traces of essential food value or none at all.
3. The degree to which nutrients in two basic foods supplement each other when the proportions in which the foods are combined and eaten are changed.

White rats are good experimental animals because they are small, clean, easily handled, and easily cared for. They respond to different foods much as do people. Compared with human beings, white rats have a short life span. Their growth rate is 30 times faster than human growth, which makes the effect of diet quickly apparent. Most children like animals, and the laboratory rat cages soon become a center of interest for children and adults. Ordinarily, rat-feeding experiments require 7 to 8 weeks to be carried to a satisfactory conclusion.

The "Basic Seven" food groups least adaptable for demonstrating supplementary relationships by use of the rat are those of citrus fruits and tomatoes and of butter and fortified margarine because the essential nutrients in them are limited to vitamin C and vitamin A. Deficiencies of vitamin A do not develop quickly because this vitamin is stored in the liver and the supply is often not depleted for many weeks. Basic foods most adaptable to showing the supplementary relations are combinations of milk and milk products with breads, flours, and cereals of whole grain, enriched, or restored types.

It is important that students understand the purpose of a rat-feeding experiment. If the initial planning for the project is one in which you and each member of your class assume a share of responsibility, there will be more enjoyment and profit for the group. You should impress on your students that rats are a part of a scientific study and should not be considered pets. If your experiment is to be effective, you will constantly point out the similarity between the needs of the animals and the students for the foods used in the experiment.

It stimulates interest to have each rat named. The progress of each animal can then be recorded on a large wall chart on which age, sex, diet, and starting weight should be indicated. See Appendix F, pages 199–202, for detailed suggestions for care and feeding of rats.

As the experiment progresses, students will need guidance in their observations of animal weight and growth, disposition, fur, skin, tail, eyes, ears, nose, breathing, red blood, facial expression, and general appearance of well-being. Encourage students to think of other signs of good or poor nutrition and list them. Characteristics to note in well-nourished and poorly nourished rats can be found in Appendix F, pages 199–202.

At the end of an allotted time in the experiment, change the menus of the rats. The poorly nourished rats should be fed the diet of the well-nourished animal so that students can see that food makes a difference also in rebuilding bodies. Students usually feel sympathetic toward the poorly nourished rats and will be happy to see them grow bigger and stronger.

It may be desirable to feed the healthiest rat the poor diet, so pupils can recognize the need for a continued good diet. Do not let rats become so undernourished that there is risk of their dying. Probably a class demonstration should always have at least two rats on a given diet. In that way individual differences may be demonstrated. Two rats may be kept in one cage and distinguished from each other by ear marks.

When the experiment is completed, the rats should be disposed of quietly without ceremony. It is unwise to give them to children to take home. They can be killed painlessly by placing them in a small can with one teaspoon chloroform or ether on absorbent cotton. Keep the can tightly covered for 10 or 15 minutes. The rats may be given to the janitor for disposal. Other animals, such as the chicken, guinea pig, or hamster may be used for nutrition demonstrations.

PREPARATION OF FOOD AT SCHOOL

Preparation of food is a method of teaching which may help the students to change their attitudes about some foods, and it also provides opportunities to apply generalizations of nutrition. For instance, you can increase the acceptance of vegetables, fruits, eggs, and milk dishes by having the students prepare and eat them.

Rejection of many foods seems to be due to hesitancy to try the new. Studies of the popularity of foods show that often a food is disliked by people even though they have never tasted it. This is more often the case than when people have tasted and disliked the food. We need a spirit of adventure and curiosity in relation to food.

The classroom teacher can encourage this spirit of adventure by guiding the preparation of foods in several different ways and setting the stage so that students will taste each form. If you allow the reactions to each food to be freely expressed, you can show ways to

modify flavor or texture so that the food is acceptable. If this approach is made, each individual can feel that he is making an independent choice rather than following rules made by an authority.

The teacher should present a food as being both pleasurable and nutritious. Even though our choices of food are made independently, they are not made wholly on the basis of pleasure in eating. *Every* food has something to offer. When a food is prepared, its role in a well-balanced diet should be presented in a manner the age group will understand.

If Jane says that she will eat but a few foods in each group, you can point out what this means in terms of values which she considers most important. If Jane chooses to continue questionable food practices after you are certain that she understands the facts, the decision is her responsibility, not yours.

PLANNING MENUS FOR THE SCHOOL LUNCH

Have you thought of arranging for students to help plan the menu for the school lunch? Often we talk about food and let the students prepare food in the classroom, but we forget the other real-life situations in which they can help.

Planning menus for the school lunch can be used as a means of changing attitudes of students toward foods. When food preferences are different, students must learn how to make a group decision. This may mean that no one gets his first choice and that some foods on the menu may actually be disliked by a few students. Group pressures may be great enough to result in acceptance of foods by all class members if, at the beginning of the project, everyone agrees to support the decision of the majority.

When students are expected to solve real problems, they are likely to be fair about considering all important factors. In addition to considering differences in food preferences, the person who plans the school lunch menu is faced with the problem of providing at least one-third of the necessary nutrients for a day within limitations of money, time, and equipment. Students who puzzle through the many facts involved in solving these problems are more likely to cooperate by eating the foods actually served to them than are students who are merely told that such planning is difficult.

If this project includes checking plate waste by older students, they may become more aware of dangers to themselves in disliking foods important for good nutrition. Differences in food preferences make group feeding difficult. Limited budgets of both time and money prevent catering to personal tastes, so that meals away from home may be quite inadequate.

Furthermore, the menus planned later by the lunchroom manager may be more acceptable because she, too, can learn more about food preferences from the menus planned by students. The school lunch managers who cooperated in a study in Iowa (17) seemed pleased to be considered a part of the educational team. All of them were willing to describe limitations in each situation to the students and to serve the menus planned by the various classes.

As students plan menus, they learn how to apply the facts and principles of nutrition. Furthermore, facts have more meaning as they are used. Meaningful facts are more easily remembered than abstract ones not related to experience.

MAKING AND USING POSTERS

Making nutrition posters and pictograms for the school lunchroom may be an excellent means for correlating the teaching of nutrition and art. A good poster conveys an important message in an interesting and artistic manner. In the process of selecting ideas for posters, students can be encouraged to study nutrition and to formulate generalizations that can be understood by all of the people they wish to reach.

In the process of organizing ideas so that they can be used for a poster, generalizations must often be simplified and reduced in length. When this is done, one must really know nutrition facts in order to make short, accurate statements. Thus, knowledge may be increased. Furthermore, in an effort to show others *why* good nutrition is important, the student may convince himself.

"Being part of a poster" may create interest too. Have you ever used students as figures in a living poster or graph? One teacher wanted to show her class what proportion of them had good, fair, and poor diets so she asked members of the class to make a poster. First she had 10 girls stand up. Then she divided the girls into three groups to show the per cent of the class whose diets were poor, fair, or good. Four girls in one group represented the 40 per cent of the class whose diets were poor, and four more girls represented the 40 per cent whose diets were fair. The remaining two girls represented the 20 per cent who had good diets. This is a simple dramatic way to make percentages from food surveys meaningful. Of course, you might have to use some imagination if the per cents were different and you needed a fraction of a girl to represent a classification.

A living poster may be more interesting than a traditional one. It can be seen by everyone in an auditorium when many graphic materials cannot. Furthermore you may feel that you haven't time to make illustrative material of desirable standard and so you may pass

up opportunities to make nutrition education interesting and meaningful. A living poster takes more imagination than time.

Children may have fun with pictograms, which they may make for themselves if they have the information. The pictograms on page 21, showing some results from the Iowa study, suggest an exercise of this type.

ILLUSTRATED TALKS

Students learn while preparing demonstrations and talks, just as while making posters. If ideas for the talks are selected from many sources, students must learn facts and generalizations and evaluate ways of applying them. The generalizations in Chapter Four may be very helpful in organizing such presentations either by the students or the teachers. Talks are likely to be satisfactory if such criteria as the following are used to evaluate them.

1. Will the group hearing the talk think the facts selected are important?
2. Will they be able to use these facts as presented?
3. Do the illustrations project the idea clearly to the viewer?
4. Does the summary emphasize a few important generalizations and show ways to apply them?

There are many opportunities for giving such talks or demonstrations to (a) one's own classmates, (b) groups of younger children, (c) parents, and (d) other adult groups. With such audiences, students recognize the importance of organizing their ideas so that each lesson is appropriate for each age group. This will improve their acquaintance with nutrition facts, and strengthen their desire to learn more.

USING PROBLEM-SOLVING TECHNIQUES

Problem-solving capitalizes on the desire of students for independence and can be effective learning if skillfully guided. This technique is probably most successful when used as part of other methods, such as planning for the school lunch or discussing case situations.

Through solving the problems, the students do not learn by rote but come closer to the situations they meet every day, in which choices are necessary and decisions must be made. Since choices must be made as a part of everyday living, learning to use a good method for making decisions is an important aspect of all education.

Students may use the following steps in the process of solving problems related to food: (a) propose possible solutions to the problem (you may wish to add solutions to their list); (b) assemble

facts regarding the consequences of each proposal; (c) consider the resources available for solving the problem; (d) decide what values would be furthered by each solution; (e) make individual or group decisions in terms of the values considered most important by those making the decision.

Making decisions by this form of reasoning is likely to result in better nutrition for more people because it is not blind obedience to dictatorial leadership. This form of education permits individual differences in food requirements, possible changes in food facts, food availability, and individual preferences.

For instance, the young man who knows nothing about the need for vitamin A, but who is told that carrots are good for him because they contain vitamin A, is not likely to be impressed unless he already likes carrots. But if he is asked to locate a rich source of vitamin A which will give him good vision under all conditions of light, he may independently find out that carrots have high vitamin A value and be proud of his discovery. He will probably be much more impressed with this yellow vegetable because he solved this specific problem. When this method of education is used, it weakens the resistance to changing food practices.

USING LITERATURE EFFECTIVELY

Many interesting bulletins and books are available to the schools and adult groups for nutrition education. They are written for different age groups, with appropriate vocabularies. The concerns of different groups are anticipated. These books cannot replace the teacher, however, no matter how well written they may be. The teacher must guide the use of literature if reading is to be most effective.

Reading as part of nutrition education cannot be routine if it is to be valuable. Reading must be done for a purpose which the students recognize and accept. A reading assignment should be made only after students know why they are to read. During preparation for reading, the teacher can make sure that her objectives and those of her students are consistent, even if they are not identical.

Often students are expected to read for information. Information for what? To repeat facts to the teacher or to help the students think for themselves? If the teacher simply assigns pages in a book to be read, students can do little but guess what the teacher will ask them in recitation. On the other hand, if the students read when they need information, they not only know what to look for, but they have a reason to remember what they read.

Facts acquire meaning with use. If the students can see the usefulness of a fact, they learn it more easily. If no immediate use is evident, the fact is likely to be forgotten soon. For example, foods classified in each of the "Basic Seven" groups are difficult to learn when mere memorization is expected. However, when we use the "Basic Seven" classification as a tool for planning menus and evaluating food plans, the facts themselves are more easily learned.

Sometimes students read for the story that is told and not primarily for nutrition facts. The story may describe a situation that is suitable for group discussion because it is similar to one which they might encounter. It may have enough detail to make intelligent discussion possible. When this is true, the story can be used as a case situation.

WAYS TO WORK WITH PARENTS

Because most of our food preferences are formed at home, the influence of our parents and other family members has been greater than that of anyone else in forming our food habits. This means that nutrition education with children may be ineffective unless we work with the parents of those we teach.

Personal contact is probably most effective, because talking over problems can be enlightening to everyone. We may be impatient with failure of parents to apply facts of nutrition until we are aware of the complexity of some of their problems. When two of the authors talked to a group of parents and suggested that children would benefit as much from well-planned menus as did pigs from well-planned rations, one father reminded us that hogs ate what was served to them while children were not so docile.

Establishing desirable food habits or changing undesirable ones is not simple. Many factors may influence a child's acceptance of food. If you recognize the difficulties of parents, they will be more receptive of your teaching for several reasons: (a) You will not put them on the defensive by implying that they could do better if they really cared. (b) You will be sure that ways to increase acceptance of foods are taught along with the importance of the food. (c) You will plan with parents for ways that teaching at school can supplement learning at home.

Meeting parents in a group is usually more feasible than individual conferences and may actually be more effective. In a group you can show how nutrition can affect the way children look, act, and feel, and you can review ways to achieve good nutrition.

From the first meeting with parents, you will be most successful if you can establish a "togetherness." Both you and the parents are

interested in the growth of the children. Together you can identify difficulties in establishing good health habits and together you can solve problems.

The steps in problem-solving can be used effectively with parents if the problems are real and clearly defined. In the process of solving a problem you will have opportunities to present pertinent facts and to show how alternate solutions will affect the welfare of children.

Parents can be informed by letters or printed material, but some dangers accompany this method of communication. The parents may misunderstand your motives in sending material home or they may not interpret the facts correctly.

Some parents may not be reached in any other way simply because they do not come to meetings or because you haven't time to visit them. If children are old enough to plan ways to get information to their parents, they may also interpret it so that it will be used effectively.

REFERENCES

1. Stone, J. G. Getting the most out of health education tools. *Jour. Amer. Diet. Assn.*, 16:329, 1940.
2. Pett, L. B. A new outlook for community nutrition. *Jour. Amer. Diet. Assn.*, 23:13, 1947.
3. Lowenberg, Miriam E., et al. *Score your diet*. The Iowa State College Press, Ames, Iowa, 1957.
4. Rodewald, Shirley. Agreement between dietaries reported by Napier school children and their mothers. Unpublished master's thesis, Iowa State College Library, Ames, Iowa, 1950.
5. Dickins, Dorothy. Some effects of a white corn meal shortage. *Jour. Amer. Diet. Assn.*, 21:287, 1945.
6. Hurt, Mary Lee. A study of the effect on, attitude toward, and home carry-over of homemaking education while teaching is keyed to lower and middle class values and practices. Doctoral thesis, University of Illinois, 1953.
7. Sweeney, Mary. Changing food habits. *Jour. Home Econ.*, 34:457, 1942.
8. Barbour, Helen. Relationships of values and process concepts of selected students to generalizations in nutrition. Ph.D. thesis, Iowa State College Library, Ames, Iowa, 1953.
9. Lewin, Kurt. Forces behind food habits and methods of change. In the problem of changing food habits. *Bul. Nat. Res. Council*, 108:35, 1943.
10. Willerman, B. *Group decision and request as means of changing food habits*. Com. on Food Habits, Nat. Res. Council. Mimeo. 1943.
11. Radke, M., and Klisurich, D. Experiments in changing food habits. *Jour. Amer. Diet. Assn.*, 23:403, 1947.
12. ———, and Caso, E. K. Lecture and discussion-decision as methods of influencing food habits. *Jour. Amer. Diet. Assn.*, 24:23, 1948.

13. Encyclopedia Britannica Films, Inc. Fundamentals of diet. Educational film. Wilmette, Illinois.
14. United States Dept. of Agriculture, Office of Information. *For health and happiness*. Educational film. Washington, D. C., 1942.
15. Tennessee State Dept. of Education, Div. of Vocational Education, Dept. of Home Economics Education. Teaching materials for use in teaching of child development and related art in homemaking education in Tennessee. Report of a workshop. Mimeo. 1949.
16. Booher, Lela E. Basic foods work together. *Forecast for Home Economists*, Oct., 1954.
17. Pattison, Mattie. Effectiveness of four methods of teaching nutrition. Unpublished research report.