CAN FOOD HABITS BE CHANGED?

by Paul E. Howe [1]

GETTING a good diet is not always a matter of money. In fact, it is more often a matter of changing bad food habits to good ones. Every mother as well as every dietitian knows how difficult this is. Here are some suggestions on how to accomplish it. No problem in the whole field of nutrition is more important.

MAN USES FOOD as a means of satisfying many emotional needs, which are so closely related to his physiological needs that unless they are met he fails to get the most from his food. He enjoys and even demands variety, not only in foods themselves, but in methods of preparing them; he wants foods that appeal to his eyes and his senses of taste and smell; he wants to eat in pleasant surroundings. Traditionally, partaking of food with other persons has been of such social importance that the emotional satisfaction derived from eating has often overshadowed the actual physiological needs supplied by food. These factors, together with food habits that have been established in connection with them, greatly complicate the attainment of an adequate diet.

Dietary habits are double-edged. If they are good, they help us to resist changes to other, possibly less satisfactory, diets. If they are bad, they act as a barrier to the adoption of more satisfactory diets.

Primitive man was chiefly concerned with securing a sufficient food supply. In modern life not only the increased production of food, but its manufacture, sale, transportation, distribution, selection, and preparation have made a greater variety of foods available and have changed the character of many common foods. Present-day facilities for travel have tended to break down local food habits and to increase the demand for products of distant areas. Scientific research and exploration have introduced many interesting and nutritious new foods that offer opportunities to add variety and interest to meals.

The ability to transport foods easily and economically has led to marked changes in food habits. It has encouraged the production of particular crops in the areas best adapted to grow them. It has

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enriched the dietary in periods of normal production. In times of crop failure in one area, it has made possible the procurement of food produced elsewhere.

The ability to store foods over long periods and to make use of manufacturing processes that preserve or increase palatability or attractiveness have had similar influences. On the other hand, storage and manufacture have created new problems. They have modified the nutritive value of natural foods by removing, reducing, or destroying some of the nutritive factors and concentrating others. These changes in the nutritive value and palatability of foods have in turn created new wants.

FOODS FURNISH THE ESSENTIAL NUTRIENTS

The nutritive requirements of man are determined and expressed in terms of essential components of foodstuffs such as carbohydrates, fats, proteins, vitamins, minerals, and water, or the energy derived from some of these components. The necessary quantities of the various factors vary with the size, age, and activity of the individual and with the external conditions to which he is subjected. In arranging the diet, however, man usually thinks and plans in terms of actual foods—meat, potatoes, milk, salads, for example—rather than of essential nutrients. Natural foods usually contain some of all of the necessary nutrients, although the amount of a particular nutrient may be so small in a particular food that in ordinary quantities the food may scarcely be considered a source of it.

It is possible to satisfy nutritive requirements from a large variety of foods. To meet different individual, group, or regional tastes, to utilize available foods to the best advantage, and to modify diets successfully, it is important to know the more important contributions that various foods make to the diet. This has been simplified by classifying foods into groups that are similar in composition or that are particularly good sources of some nutrient or nutrients. Thus, for example, meats, milk, and eggs are sources of protein of good quality; milk, the leafy vegetables, and dried legumes are sources of calcium; the green and yellow vegetables and butterfat are sources of vitamin A and carotene. Such groupings are discussed in detail in the article on Planning for Good Nutrition (p. 321). Using this knowledge, it is possible to express nutritive requirements in terms of quantities of types or groups of foods.

This grouping of foods has a further advantage in that it does not give undue emphasis to any particular food. It permits elasticity in selection to meet a variety of conditions and tastes. In the course of scientific investigation, the discovery of a nutritive factor sometimes becomes associated with a particular food. The application of such knowledge often leads to a misunderstanding of the possibilities of the use of other foods. It is important, therefore, in presenting information on nutrition, to mention more than one source of each nutrient factor.

Fluid milk, for example, is the standard source of calcium. The daily consumption of a quart of milk by a child or a pint by an adult is an assurance of an adequate calcium intake. But those who do not like or cannot get fluid milk may substitute canned or dried milk,

cheese, an extra amount of leafy vegetables, or even calcium salts and still meet their daily calcium requirements.

Carotene, one of the precursors of vitamin A, is chiefly responsible for the yellow color of vegetables and milk. But carotene is also present in the green leaves of plants, although masked by the green color. Any of the yellow or green vegetables, especially the leafy vegetables, or the yellow foods derived from animals, may be selected as a probable source of vitamin A.

An example of the value of substituting one food for another for economic reasons was shown some years ago by A. F. Hess. At a time when lime and lemon juice were the accepted sources of vitamin C (the antiscorbutic vitamin), Hess demonstrated the value of tomato and potato juice in the treatment of scurvy in Negro children in New York. In this way he introduced antiscorbutic foods that were cheap and easily obtainable.

Complications arise in recommending foods as sources of particular nutritive factors because variations occur in the composition of different varieties of the same product as the result, for example, of differences in maturity, climate, and the fertility of the soil. Take, for instance, green leaves as a source of carotene, the precursor of vitamin A. Carotene is rather abundant in fresh green leaves, but as soon as they are picked the carotene begins to disappear. The loss is least under refrigeration and in an oxygen-free atmosphere. Drying helps to stop the disintegration, but even the dried leaves lose their vitamin potency in time, especially in hot weather. Carotene is destroyed in cooking, especially in the presence of oxygen. It is not enough, then, to know the carotene content of fresh leaves. It must be assumed that a considerable amount of carotene will be lost before the leaves are eaten, unless, of course, they are eaten in the garden. Even then there would be difficulties, for all leaves of the same plant are not equally good sources of carotene. The leaves of old-fashioned green garden lettuce may not be so attractive as the crisp inner leaves of a tight-heading variety, but these blanched inner leaves are not nearly so rich in carotene as those of the looser headed, darker green plant.

Fortunately, not all vitamins are as unstable as vitamin A. It is obvious, however, that a single statement of the composition of a food is not sufficient and that any analysis of a food as grown may need to be interpreted in the light of changes that may have occurred in it during the interval between harvesting and consumption.

The methods of preservation and purification used to keep foods from spoiling or losing quality or to make them more attractive often change the composition of the original food. Thus there may be a reduction in certain constituents upon drying or cooking, as in the case already discussed, or a concentration of carbohydrate such as occurs in the manufacture of white flour, refined sugar, and polished rice. These changes create special nutritional problems when products of this type form the major part of a diet. The use of polished rice is a good example. In polishing rice the outer hull and the germ, which contain vitamin B_1, are removed, leaving the inner starch-rich endosperm. People who live largely on polished rice develop the nutritional deficiency disease beriberi. This can be corrected by feed-

ing the rice polish itself or some other source of vitamin B_1. But once polished rice has been used it is very difficult to get people to accept unpolished or brown rice, in spite of its superior nutritive value.

Sugar is an example of a manufactured purified product that introduces a nutritional problem, in this case because of its appeal to the taste. Sugar is practically pure carbohydrate and nutritionally valuable only as a source of energy. It is useful in adding variety and interest to foods, but when taken in excess it dulls the appetite and thus restricts the consumption of other necessary foods.

The use of refined products is not objectionable in itself, but it necessitates careful selection of other foods if the diet is to be adequate.

MENUS AND MEAL PLANS

A menu may be considered as a plan by which foods are combined to make a satisfactory meal. By working out a series of menus a variety of foods and an adequate diet can be assured. Menus tend to follow patterns and are part of our food habits. Through skillful planning of combinations of food, nutritive elements in which the diet was previously deficient may be added, often without upsetting an accustomed routine. A large part of the success of this method of changing food habits lies in maintaining interest in the meals from day to day. This is just as true for maintaining good dietary habits as for changing poor ones.

Although the immediate concern will be with the nutritive elements in the menu, it is important to remember that many other factors enter into the satisfaction people obtain from meals, particularly the methods of service and the surroundings in which food is eaten. Interest in food through the menu or meal plan is attained by—

(1) The use of foods attractive in themselves.
(2) Changes in methods of preparation of foods.
(3) Combining the foods in attractive prepared dishes.

In the last-mentioned case the attractive characteristics of some foods, such as meats and sugars, may be used to add interest to less attractive but necessary or useful foods such as the bland cereal grains, certain vegetables, or milk.

It is not enough to provide variety among the meals of one day. It is necessary also to prevent the monotony that follows the frequent repetition of foods or combinations of foods, or the repetition of the same foods at regular intervals. This is evident from the difficulties that arise in feeding large groups of persons, as in college dining halls, army messes, and correctional institutions, particularly when the cooking is mediocre. Poor cooking and monotonous meals have been responsible for many riots. It is a matter of record that Harvard College was almost wrecked in its early days because of monotonous and inadequate meals.

In making up a menu for dinner, a housewife who had a good knowledge of nutrition might go through a process of thinking something like this:

Soup? It's appetizing and not too filling.
Meat? Yes. No animal protein for the grown-ups so far today.
Potatoes? Yes.

Other vegetables? Broccoli, turnips, beets, or carrots? Make it broccoli and carrots—not enough vitamin A so far.

Salad? Lettuce with cottage cheese and pineapple—more carotene and more calcium.

Dessert? Cottage pudding? No; calcium is still low. Make it pumpkin pie and a cup of coffee with cream.

Now, let's see—we had grapefruit this morning, tomato juice this noon, and broccoli, carrots, butter, and salad tonight to provide sufficient vitamins C and A. The meat, bread, and cottage cheese, and the peanut-butter sandwiches this noon provide plenty of protein. The calcium may be a little low, but pumpkin pie has helped and there was skim milk in the bread. The children have had milk for breakfast and lunch, so their calcium intake is well taken care of.

The B factor? We had only white bread, but there were meat, peanut butter, cheese, and vegetables to help out.

There is plenty of iron; and by the time the family fills up on bread and butter there will be enough calories.

Most of us do not go through such an analysis as this. The chances are that we leave the planning of meals to someone else. Even the housewife may use ready-prepared menus. What training did the person who planned the meals have? How well was the planning done? If a pattern was followed, was the pattern good? Upon the housewife, dietitian, cook, or steward is often thrown the responsibility for inducing us to eat foods that are needed even though we may not like them. They are the ones who should be trained in the general facts of nutrition. We look to them to plan meals that we can enjoy with the assurance that they are adequate as well as appetizing.

While menus and meal plans are useful in attaining a good diet, they often do not provide sufficient evidence by which to judge adequacy. Often diets appear inadequate when judged by the menus but are shown to be adequate by analyses of the quantities of foods consumed. Conversely, a similar analysis of interesting menus may show an insufficient intake of important foods, especially vegetables.

PSYCHOLOGICAL FACTORS IN FOOD CHOICE

In adapting food to meals, there are complications that arise because of man's intelligence. In modern civilization, many people have gradually conditioned themselves to expect and demand a much more complicated dietary than is needed to satisfy nutritional needs. So far as people can afford these habits, they should enjoy them. Enjoyment is, however, only relative—as soon as new opportunities arise, dietary habits may become more elaborate. On the other hand, where enjoyment interferes with the acceptance of an adequate dietary, the individual is faced with the dilemma of continuing his habits or accepting something that appears to him to be less interesting and satisfying.

Man likes what he is used to, but he also likes a change. On this premise it should be possible, under circumstances in which he is faced with the need for a correction in the dietary, to condition himself to a new set of habits.

In any practical attempt to improve nutritional status, therefore, use should be made of instincts, appetites, habits, and any other devices to condition him favorably to desirable food choices. Hunger and appetite can be made valuable aids in securing the acceptance of food. Hunger, which is due to actual contractions of the stomach, stimulates the seeking of food. Appetite, on the other hand, is asso-

ciated with the presence, or even the memory, of pleasant odors and flavors of food, and may occur even when the stomach is full. When hunger contractions or pangs occur, people show irritability and restlessness, even when the attention is so occupied that the contractions are not recognized. When three meals a day are eaten at regular hours, hunger contractions are seldom noticed, and when only one or two meals a day are eaten a certain amount of indifference to them may be built up. Excitement, pain, or anger inhibit hunger and may thus create resistance to new foods. Outdoor exercise, physical work, or insufficient food stimulate hunger and lower the level of discrimination, thus creating a situation favorable to the acceptance of new foods that may be utilized when there is need to modify dietary habits.

People often take food as a result of appetite rather than of hunger. Appetite stimulates the flow of digestive juices but is not essential to the digestion of food, since once in the stomach, food is equally well digested whether it was palatable or not, provided no serious or continuous emotional disturbances are involved.

Habit plays an important role in the acceptance as well as the refusal of certain foods and thus is useful in efforts to provide an adequate dietary. Habits are paradoxes. A man will eat the same breakfast year in and year out but will rebel if his dinners or suppers are the same, or even if they are repeated at weekly intervals. In New England, hot baked beans are or were traditionally necessary for Saturday suppers and cold baked beans for Sunday breakfasts. In the South boiled beans are often a customary second dish for both dinner and supper. In other parts of the country, if beans are served for two meals in succession there is likely to be trouble.

Man is not alone in clinging to habit in the face of change. Animals accustomed to a particular ration do not readily change to an unfamiliar diet. For instance, a farmer in Ohio purchased some cattle raised in North Dakota that had never been fed corn, and it took him some time to teach them to eat corn. He reports that one steer never did acquire the habit. Animals, however, show a greater willingness to consume the food presented to them than does man. They can also be taught to expect variety in their diets.

Modern psychology has shown how many of our actions, including attitudes toward food, are the result of conditioning or involuntary reactions to stimuli. Poffenberger favorably conditioned a group of students to music they did not like by playing it while they ate attractive meals. Most of us can explain an intense aversion to a particular food by its association with some painful event, or remember first discovering that we liked a new food when it was eaten on a gala occasion. Conscious use of such methods of modifying established habits or creating acceptance of desirable foods offers a valuable means of improving dietary habits.

The role of instinct in determining the choice of foods is not certain, but some interesting examples of its effect on choice are reported. An experiment with rats, conducted for the purpose of determining whether animals search for specific nutrients, indicated that the choice of a particular food was the result of a generalized search for food and that habit or conditioning played a part in its selection. Under experimental conditions, rats have been found to choose a satisfac-

tory diet from 11 relatively pure foods, including protein, carbohydrates, fat, certain vitamin-rich foods, and minerals, and to increase the consumption of sodium chloride or calcium where additional quantities of these elements were needed. Experiments with chicks showed that certain of them consistently chose better diets than others.

Man's instinct or ability to select a satisfactory diet from among a number of foods or to modify the diet to meet changes in nutritive requirements has also been demonstrated. There is a careful report of three young children who were allowed complete freedom of choice from among a wide variety of natural foods over a long period of time. The diets selected met all their nutritive requirements and resulted in excellent growth.

But these are experimental conditions. Under the normal conditions of everyday life, man's instinct is so overlaid by conditioning that he cannot be trusted to select food with any relation to his physiological needs.

At present sufficient evidence to determine the exact manner in which the body recognizes nutritional deficiencies and determines the choice of food is lacking. One suggestion is that nutritional deficits cause physiological changes in the body and that these changes alter the taste mechanism and set up a craving for a specific food.

PROBLEMS IN TEACHING GOOD FOOD HABITS

A survey of dietary habits indicates that there is still much to be done in bringing people to choose or accept a diet that meets the energy needs of the body and provides a liberal allowance of all the nutrients required. The difficulties involved become evident when an attempt is made to change the food habits of persons satisfied with a diet that is adequate from the standpoint of energy but inadequate in other respects; to make drastic changes in the food of troops and yet maintain their morale; to attempt to set up a restricted though adequate diet for people on relief; or even to solve the problems of the housewife who is trying to stay within her food budget and still have a well-nourished and satisfied family. In each case the major difficulty lies in getting the persons concerned to accept the foods that should be used among those that are available.

The most promising solution of the problem of getting people to accept an available adequate diet lies in education and training. Training must begin with the establishment of good food habits in the child, and involves learning to enjoy a simple adequate diet and to accept new foods to replace or supplement customary foods. Success depends largely on the skill and attitudes of the mother. Although education begins at home, it should be carried on also in the schools. Information given there reaches back into the home and affects the parents and other members of the family.

Finally, there are great possibilities for general education for better dietary habits, particularly for adults. Here the problem is to insure the sound, broad presentation of facts, unbiased and in their proper relationships. Many books, bulletins, and pamphlets containing a large amount of information about nutrition are available for use in the home and school. Radio broadcasts and household publications

offer advice and aid in planning meals. Many of these are biased, however, and the information should be carefully evaluated before it is accepted. Great care must be taken to make sure that material to be used in schools is factually accurate, that it presents completely unbiased discussions, and that it promotes no food product exclusively.

A considerable part of the current popular material about food is presented in the form of recipes or suggestions for new ways of utilizing foods. This kind of material is very useful in securing the acceptance of new foods or the wider use of common foods. Though recipes may be of little immediate interest to students of nutrition, they are of real value to those who must prepare and serve meals. To be most useful, material on the preparation of foods should present facts about the place of the foods in the dietary. An example of an excellent service of this kind is the mimeographed press release called The Market Basket, which the Department of Agriculture has issued weekly for a long time. It combines information on the general nutritive requirements of the family with information on seasonable foods and presents simple yet attractive methods of preparation.

As previously mentioned, material that is to be used as a guide either in teaching nutrition or in planning dietaries should suggest more than one major source of each of the important nutrients. This is especially true if the material is to be used by people in all parts of the country.

The average person can hardly expect to keep well informed about all the changes in and additions to knowledge of man's food requirements, but he should realize the extent to which his food habits play a part in determining his well-being. He should also realize that these habits are not infallible guides, and that a reasonably satisfactory diet with an abundant supply of nutrients can be achieved at different income levels if one is willing to bring an open mind to its acceptance.

Education and training are especially needed for those who are responsible for the planning of meals and the preparation and service of food. More attention needs to be paid in recipes to the preparation of simple inexpensive dishes that utilize in attractive forms the maximum of economical foods and the minimum of more expensive foods so that physiological requirements may be satisfied without lessening enjoyment.