

# *Teaching Nutrition*



## CHAPTER ONE

# *Why Nutrition Education?*

"Since the strongest root of happiness is health, I should like to see my children abundantly instructed in the knowledge and care of their bodies. . . . I should make education in health a required course in every year of schooling from kindergarten to Ph.D. I should want my children to learn as much about the structure and functioning, the care and healing, of their bodies, as can be taught in an hour a day for fifteen scholastic years. . . . And if the day should come when our dietitians will have at last made up their minds as to what they really know and believe, I should ask them to teach the principles of diet an hour in every school week for fifteen years, so that our people might make with some corporate intelligence the dietetic changes required by the passage from an outdoor and physical life to a mental and sedentary one. I would teach health and cleanliness first of all, and expect that all things else would be added unto them."

These are not the words of an overzealous nutritionist but of a philosopher, Will Durant, writing on the topic, "What Education Is of Most Worth?" (1).

Why should nutrition education be added to the school curriculum? Through the years, feeding children has been regarded as a prerogative, privilege, and responsibility of the home. Attempting to change the food habits of an individual has been regarded almost as an infringement on his personal rights. People are about as reluctant to report what they eat as to divulge their income.

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Moreover, the educational program is already overcrowded. Educators may rightfully ask why schools should assume this added responsibility. How can we justify making one more claim on the time and efforts of teachers by introducing another area to be covered in the curriculum?

Briefly, here are some of the reasons why personal and public welfare demand that children be taught the rudiments of nutrition. Good food selection should become second nature to them, and proper



One more claim on the time and efforts of teachers!

nutrition of their bodies a prime responsibility. Furthermore, the meaning of poor nutrition should be so imprinted in the minds of youth that, as citizens in a democracy, each will speak and work to eliminate wars, depressions, unfair trade practices, and other conditions which result in widespread hunger and suffering from poor nutrition.

#### **NUTRITION IS THE CORNERSTONE OF HEALTH**

Nutrition, according to Stare (2), is one of the most important single environmental factors affecting our personal well-being. This statement is also recognized as a basic philosophy of the World Health Organization, which includes doctors, sanitary engineers, public health workers, and nutritionists. Schools generally have accepted health education as a responsibility. If nutrition is a major factor in health, health education which neglects nutrition is only fulfilling part of its function.

Good food selection, the cornerstone of good nutrition, must be learned. Unfortunately, we have no automatic mechanisms to direct the choice of foods which build healthy bodies and which keep them running satisfactorily from day to day. It is true that our bodies have many reserves and safety devices, and can stand an infinite amount of abuse. Because of this very fact, many doubt the ultimate penalties of a poor diet. However, the numerous ailments that beset our middle-aged population in comparison with the few found among youth bear witness to the fact that ultimately a toll is taken. The extent to which poor food habits contribute to early aging is not known; undoubtedly it is one of the important factors.

### **NUTRITION IS A COMMUNITY CONCERN**

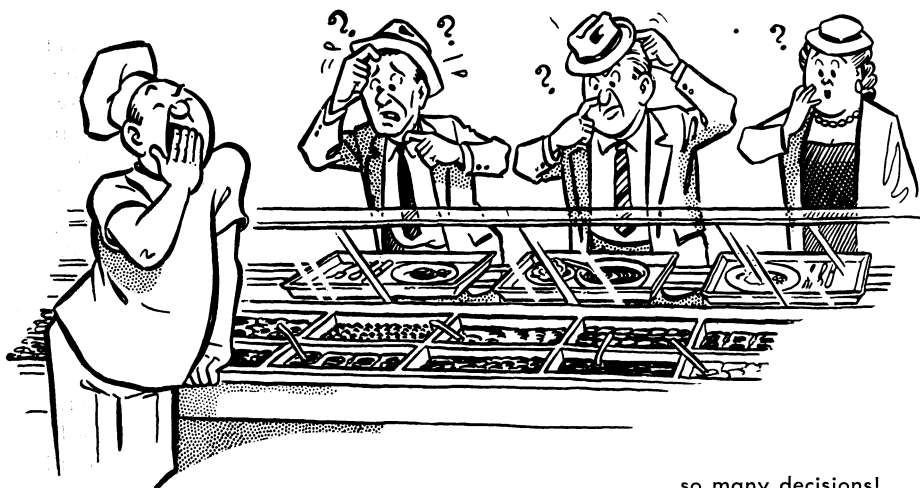
We cannot legislate or immunize against poor nutrition. Fortunately, many measures for the protection of health can and should be under the regulation of the law. Thus we can prevent the spread of disease by contaminated water, by milk from unhealthy cows, or by carriers of disease in our public eating places. Unfortunately, such protection is impossible against the insidious effects of a poor diet, which may be equally weakening. Education is our main bulwark against poor nutrition. Even with plenty of food, or plenty of money to buy food, the uninformed are likely to develop food habits incompatible with their health.

Poor nutrition has vast social and economic implications. The poorly nourished child is a focal point of infection. He is a laggard in his classes and often a problem in his community (3). Poor nutrition has been described as a cancer in society. In 1941, Thomas Parran, then Surgeon General of the United States, said, "Like an iceberg, nine-tenths of our malnutrition, and the most dangerous part, is under the surface" (4). Although it must be attacked along many fronts — economic, political, medical — education in nutrition must be the basis for the entire undertaking.

### **REQUIREMENTS CHANGE WITH AGE**

Nutritional needs and food habits change with age. That is why nutrition education should continue from kindergarten through college. A failure to adjust one's food habits as one grows older is the basis of many of the health problems of middle age. The best way to develop good food habits and to have good nutrition at any one age is to have experienced them in the preceding age.

Food is a major commodity in the commercial world. We are surrounded with a multitude of situations in which choices of food must be made — choices which will affect health, money, and personal



satisfaction. Just as education helps us make decisions in every other field, it certainly should help us make wise choices concerning our use of food. In perhaps no other area of living is the individual called upon to make so many decisions or to make decisions so often. Do we not have a right to expect our education to help us in making these decisions?

### **AN IMPORTANT MEASURE IN CONSERVATION OF RESOURCES**

The future points to unprecedented stress upon our educational resources. Schools will be called upon to scrutinize as never before all possible measures of economy. Industries have come to regard the nutrition of employees as a matter affecting their output. Consequently they make available to their employees nutritious meals at a minimum cost, midmorning and afternoon snacks, and even nutrition services designed to improve the home food supply. In a certain sense schools may come to regard the nutrition of the children in the same light. Efforts of teachers are wasted to an appreciable extent upon children who are hungry and poorly nourished. The maximum returns for our tax dollars in the schoolroom demand that the children be well nourished.

### **COOPERATION REQUIRED**

Nutrition education is made necessary by our interdependence in obtaining our food supply. An informed public is needed to insure:

1. *Production* of the kinds, amounts, and quality of food needed for

the health of the people of our country and of other countries that depend on us for many foods.

2. *Trade practices* which will facilitate the distribution of nutritious foods from point of production to place of need.
3. *Methods of processing* which will enable us to receive food in a highly nutritious form.
4. *Protection against fraudulent trade practices* which may reduce the buying power of the food dollar or divert it to unprofitable, even harmful, channels.
5. *Food legislation* to encourage a safe and wholesome food supply.
6. *Minimum taxes* on food commodities vital to health.

We would have a different world in which to live if children were educated to accept their responsibilities in these matters as they are educated in matters such as safety and sanitation.

### WHAT GOOD NUTRITION ACCOMPLISHES

First of all, food maintains life. Only 3 days of starvation are enough to produce profound chemical changes in the body. Man may live from 30 to 40 days without food, if not exposed to stresses such as severe cold, strenuous exercise, and emotional disturbances (5). But sooner or later, depending on the stresses and strains, death is the inevitable result of starvation. It is unbelievable, but true, that many people in the world today are dying of starvation.

When persons eat half of what they need, muscles waste away, body organs and systems change, and behavior and personality are profoundly altered (6,7). The individual becomes faint, giddy, less active, and finds it more difficult to keep warm in cold weather. Appearance changes. Skin may become dry, scaly, incrustated, gray; hair, dull and dry; eyes, dull and dead. Half-starved people, whatever their age, are old before their time.

Poorly nourished children are almost invariably stunted in growth. Well-nourished children are usually not, unless they are known to have some type of infection or a peculiar pattern of genes. Spies observed that infectious disease coincided with every instance of retarded growth when children were known to be free from evidence of nutritive failure (8). Spies also observed a tendency of children with nutritive failure (showing definite evidence or history of nutritional deficiency disease) to show retardation of growth most often in June, July, and August, the periods in which other symptoms of nutritive failure usually are most obvious.

Retarded growth or body size is one of the first evidences of poor nutrition. With the smaller body mass, the limited nutrient supply can more nearly serve the body needs. In this way, outright deficiency diseases are often avoided in times of war and famine. This has been observed time and again in the war-torn countries. Periods of

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temporary privation may be overcome (9). We are told that by 1948 there was little evidence of the retarded growth which occurred among the children of France during World War II. But the long-time effects have yet to be assessed in the total life cycle and in the next generation. It may be of interest that in wartime France, the maximum delay in growth was observed in the group of 13-year-old girls.

### **Sustains Life and Growth**

During school years, boys and girls make large increases in body size. For example, in the Iowa studies, boys of age 16 were on the average 21 inches taller and 90 pounds heavier than boys of age 6. Correspondingly, girls of 16 and 6 differed in height by 17 inches and in weight by 77 pounds (10). Only through the food eaten, the water drunk, and the air breathed can the materials needed for the increased body substance be obtained.

We do not know at the present time the optimum or best rate of growth, nor do we know exactly the nutrient needs of childhood. It is therefore all the more important that children be provided with enough food energy and surpluses of nutrients so that their bodies can sort out and retain all that is needed for day-to-day functioning and storage for future needs.

A real shortage of any one nutrient will have a detrimental effect on growth. If all needs are met, the optimum rate of growth should be achieved, provided environmental conditions are not drastically unfavorable and conditions inherent within the body are normal. That is, the well-nourished person may be expected to have good health, to mature at the proper time, to withstand the stresses of environment, to enjoy an extended period described as the prime of life, and to fulfill successfully the biological functions of the body.

### **Makes a Difference in Body Size**

Research has repeatedly shown that when we improve inadequate diets of children, growth is improved. Roberts (11) studied children in an institution who were regularly receiving one pint of milk daily in their diet. She added another pint to the diet of some of the children, and found that weight gains were much more evident among the children having the full quart of milk a day than among those who remained on the usual diet, although even the improved diet was below optimum.

Spies (12) studied the effects of poor diet on as many as 3,000 children over a period of 15 years. He recorded the effects on 600 children who had chronic nutritive failure. They were as much as 3 years behind their normal height and weight when compared with 2,000 children who were receiving good diets. The height of the boys



was especially affected by the lack of nourishment. By the time these boys and girls had reached maturity, they had stopped growing at a weight-height level 2 years behind their growth possibilities.

Spies also studied the reversal of growth failure by adding milk solids to the diet of the children. He paired off children similar in nutritive failure, and gave one member of each pair a supplement of varying amounts of milk solids over increasingly longer periods of time. The more milk the children used, within the limits of his study, the greater the increases in height, weight, physique, and speed of growth as shown on the Wetzel Grid (13), when compared with the records of the children not receiving the extra milk. Benefits of the added milk were also evident in the composition of the bones. Spies concluded that the retarding effect of prolonged nutritive failure is reversed promptly if the nutrients in the dietary supplement are supplied in sufficient amounts to overcome the accumulated deficiencies.

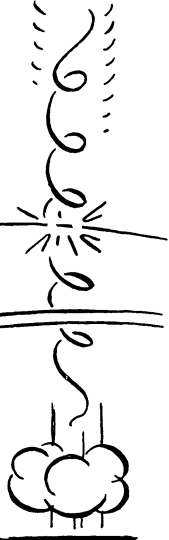
Blair (14) studied the diets of 150 children ranging in age from 2 to 14 years, and found that their food plans failed to meet the Recommended Dietary Allowances of the National Research Council (15) in all factors except vitamin A. These diets were particularly lacking in vitamin C and thiamine. Blair increased milk and other dairy products, eggs, whole grain cereals, and fruit juice in quantities which brought the children's diets up to, or in most cases well above, the Recommended Allowances.

Before she began supplementing their diets, the children as a group were making only 61 per cent of their expected gains in weight. In the one-year period of better nourishment, the percentage rose to 140 and continued high in the period after supplementation stopped. Gains in height followed a similar pattern. The percentage of children under average weight for height decreased, and

BOIN-N-NG!



... the well-nourished person may be expected to mature at the proper time.



there was a definite shift of the group toward a more favorable weight-height status.

Children of Iowa surveyed in a mass study of diets and physical development were divided into two groups for study: those who had liberal amounts of all nutrients and those who did not. The children with the liberal diets tended to be slightly taller, heavier, and larger in leg girth than the children with the poorer diets (16). The two groups of children represented the upper and lower extremes in a fairly well-fed population. The diets of the second group on the average fell only slightly short of the Recommended Dietary Allowances. Some of the diets were low in only one single nutrient, yet these slight dietary differences apparently affected the physical development of the children.

One of the most important safeguards of health in adulthood is maintaining normal body size. Young adults who are too thin are susceptible to disease; middle-aged people who are overweight may face diseases of the heart and a shortened life span. Regulating the food intake to meet the energy needs is the secret to the regulation of body size. The multiplicity of factors which influence energy needs, however, may make it difficult to achieve this regulation, and control of appetite sometimes requires almost superhuman efforts. Good habits of eating and of exercise from early childhood will help.

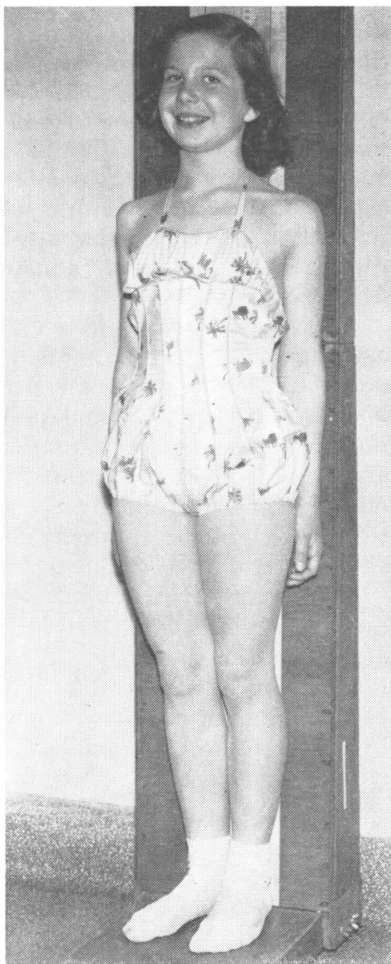


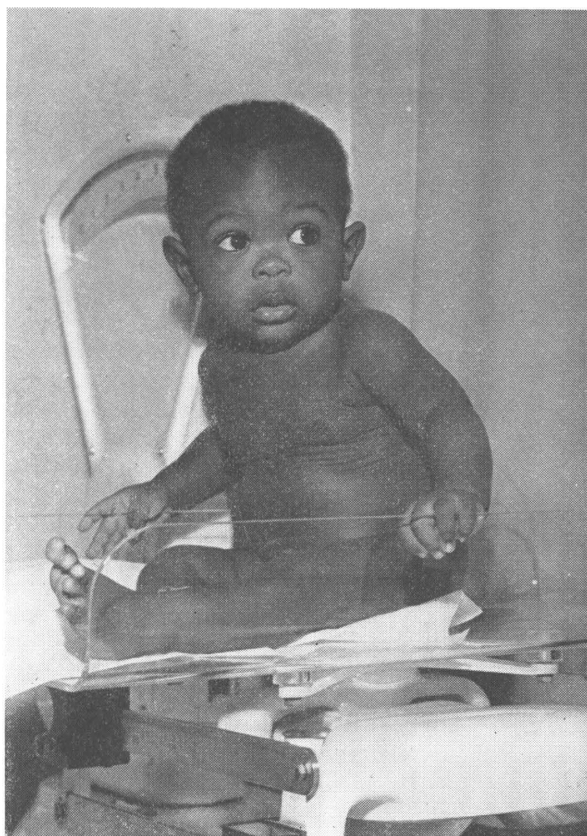
FIG. 1.1 — The marks of physical perfection include beautiful posture, soft glossy hair, radiant skin, and an abundance of energy.

### **Achieves a Higher Plane of Positive Health**

There is a difference between the absence of illness and buoyant, radiant health. In our school population today there are many

FIG. 1.2 — In the very young child we have our best evidence of what can be accomplished by nutrition.

(From **1,000 Ideas for Better News Pictures**, Hugh Sidey and Rodney Fox, © Iowa State College Press, Ames, Iowa.)



children not seriously poor in physical development but who lack the marks of physical perfection which are such a joy to see. We look almost in vain to find the rosy-cheeked children with beautiful posture, soft glossy hair, radiant skin, and an abundance of energy. When nutrition is excellent we expect to find these characteristics. When we are accustomed to seeing children who are less than perfect, we forget these characteristics of perfection. It is much easier to find an infant or small child who is beautiful and well developed, probably because more special attention is given to all phases of health at this age, including good nutrition. In fact, in the very young child we have our best evidence of what nutrition can accomplish when it is carefully applied.

The difference between mediocre and excellent diets has been clearly shown in rat experiments. Through generations, Sherman (17) fed rats a diet which proved satisfactory for growth, reproduction, and maintenance of vital functions. When, in the diets of succeeding generations, he doubled the amount of milk, amazing improvements re-



Young men subjected to half-rations reached the point of exhaustion in about one-fourth the time . . .

sulted. The animals had greater vigor, better appearance, greater resistance to disease, and reached a higher plane of positive health. Nutrition obviously made the difference between acceptability and superiority in his colony of animals. As described by Hambidge (3) these were truly royal rats!

In 1930, the search for buoyant health for their school children led the people of Scotland to adopt the milk-in-school plan (18). The action was prompted by results of an experiment carried on with 20,000 elementary school children who were given additional milk for 7 months. Growth was 20 per cent better for children receiving the milk than for those not receiving it. The increased growth was accompanied by noticeable improvements in health, vigor, and mental alertness. The Scots concluded then that the measure would have a "powerful influence in improving the quality of the Scottish race."

#### **Improves Ability to Work and Play**

Ability to do work is directly associated with the food we eat. There is an Oriental proverb which aptly describes the malnourished:

It is better to walk than to run. It is better to sit than to walk. It is better to lie than to sit. It is better to sleep than to wake. It is better to die than to live.

Half-starved people lack endurance, have poor coordination, are weak, and are slow to react. Young men subjected to half-rations reached the point of exhaustion in about one-fourth the time taken by young men with enough food (19).

The urge to play is strong for children, and undernourished children may drive themselves beyond their powers. Poor muscular development and other conditions make the costs of activity high for such children.

### Promotes Mental, Emotional, and Social Well-Being

What is the relationship of nutrition to these characteristics? There is probably no more difficult question to answer. Most of the answer must come from the realm of the subjective rather than the objective.

Spies (8) describes the personalities of children suffering from nutritive failure as apathetic. The same observation was made of the children in Newfoundland in 1944, when their diets were short in many essential nutrients (20).

Children in West Germany, after World War II, seemed to be emotionally unstable, listless, and unable to give sustained attention in school. Many were unable to stay awake or to pay attention throughout the entire period. They had difficulty memorizing facts.

These are examples of children in complicated social situations. The fault does not lie solely within the realm of nutrition. Nutrition is only one of many factors affecting the children. But, then, poor nutrition seldom exists as an isolated factor.

We do know that antisocial behavior characterizes children with empty stomachs, whatever the reason—whether it be disorganized homes, war or its aftermath, depressions, or disease.

The chances of survival of infants and children have been dramatically increased by medicine and science. Looking beyond survival, we see the challenge of abundant health. Every child has the right to the opportunity to achieve the maximum of which he is capable. Why should children be saved if they are not to be given these privileges? They cannot achieve their potential abilities with the fatigued minds and bodies which result from habitually poor diets.

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