

Part **1**

HUMAN

NUTRITION

FROM TRADITION TO SCIENCE

by Louise Stanley¹

WHEN all men got their food directly from nature, as hunters, fishers, or farmers, they could be more sure, in some ways, of getting a balanced diet than they can today. This article contrasts the old and the new relationship of men to the food supply, and shows how the modern science of nutrition is necessary to meet complex modern conditions.

NUTRITION has to do with the use living organisms make of food. All living things require food. Green plants take their food supply in simple inorganic forms from the soil and from the air and build it into more complex materials. They are able to use the energy of the sun directly in building the sugars and starches and cellulose, so important in their structure and life functions, from water and carbon dioxide. Excess energy is stored as sugar or starch or may be changed into the more compact form of potential energy—fat. This ability of the green plants to build simple inorganic material into complex, energy-containing organic compounds is of basic importance to animal life also, for animals must rely upon the energy originally stored by plant life.

Plants also absorb minerals along with the water from the soil—nitrates, phosphates, and sulfates—and from these and the carbohydrates build proteins in the many complex forms essential to the plant. These too are suitable in varying degrees for building the tissues of the animal or human body. Calcium, magnesium, iron, iodine, and various other minerals are built into plant tissues in forms available to animal life. Vitamins are a product of plant growth.

All our foods, therefore, are directly or indirectly derived from plants and have their roots in the soil. The soil, through its influence on food composition, has played an important part in determining the development and the survival of animals and men. First the soil, then plants, then animals—so has life developed. It is in the study of nutrition that the interrelation of the three is shown most clearly.

To appreciate the importance of nutrition to human life, one needs to look back to get the proper perspective. Man is the combined product of inheritance and environment. Food is the environmental factor that most directly controls his physical development; and it

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probably plays an important part in setting the pattern of nervous and emotional responses that make up the total personality.

Marett (745)² makes a good case for the thesis that a natural selection of various food substances, based on economy, has played a very important part in guiding the evolutionary process. The minerals and vitamins in foods, through their effect on the composition of body tissues and fluids and on the development of the glands controlling internal secretions, profoundly influence the internal environment of the body cells and thereby affect growth, physical form, and emotional reactions.

Primitive man was restricted to the food supply immediately at hand. This supply was determined in both quality and quantity by the soil and climate. The kind of food available and its composition were important in determining survival and the differences in the physical development of men from different areas. Food supplies had geographic limitations. Some groups of men died out altogether, others changed form through generations as the result of natural diet restrictions. Thus through painful and costly experience, with much loss of life by the way, racial food habits and appetites were built up and came to be fair guides to the choice of food under simple conditions of living.

Nomadic tribes enlarged the areas from which they obtained food. The soils in these areas varied, and certain tribes probably selected certain areas that proved more conducive to survival than others. But still food supplies were limited. With the development of agriculture, food supplies were less accidental, but they still depended upon the soil and the weather. Within such limits, food habits were the result of racial experiences and were probably responsible for clear-cut racial physical differences. These deeply ingrained survival patterns are the basis for the so-called natural instincts sometimes referred to as guiding food choice.

As the result of experience, the relation between certain foods and certain physical conditions was known long before anyone knew the real explanation. Burned sponges were used in the thirteenth century to treat goiter. It was not until 1819 that the chemist Dumas discovered iodine in this ash. Cod-liver oil was used to treat rickets centuries before vitamin D was discovered. Florentine pharmacists of the middle ages were selling lemonade as a remedy for scurvy long before vitamin C and its significance were recognized.

Strangely enough, groups with restricted natural diets seemed to acquire a special taste for foods we now know were specially needed in these diets. Hrdlička reports that among the Indians of the Southwest, where meat is scarce, fat and marrow are much relished. Squirrels, prairie dogs, and fat field mice are considered delicacies. Among the vegetables, chili and tomatoes are emphasized.

The Mexicans, among whom milk is scarce, use an abundance of the vitamin A-rich pimiento. In Puerto Rico, annatto is used along with lard as a routine in cooking. This annatto has been shown to be a rich source of vitamin A, so likely to be lacking in the Puerto Rican diet.

New knowledge of nutrition gained during the last three decades explains such food habits and some folklore. But more important, it gives a rational basis for food selection that, applied through planned

² Italic numbers in parentheses refer to Literature Cited, p. 1075.

production, education in food choice, and more satisfactory distribution, can be used to increase the length and improve the quality of human life. Fewer natural foods and more processed and fabricated foods are used today. There is a far greater variety of foods available. Tastes have changed. As a result, racial habits and appetites can no longer be depended on to guide the choice of food.

Meanwhile, commercialization of food production and increased transportation of food from place to place and country to country have completely changed the problem of the food supply. Comparatively few families produce any of their own food except outside of the cities, very few indeed all the family's food. Rarely is all the food for an individual or a family drawn from so restricted an area that soil deficiencies affect the total food supply, with the possible exception of a deficiency of iodine. Iodine is added to the diet in areas where it is known to be lacking in the soil. But as food production has become more specialized and commercialized, economic factors have come to complicate food choice and in many cases limit the family food supply in ways that were not formerly true. Furthermore, economic competition in production and processing has a greater effect on food composition than the soil has.

Studies show that below certain income levels most diets are deficient. Calcium deficiency is just as serious in its effects when it is due to inability to purchase calcium-rich foods as when it is due to producing food on calcium-poor soils. Human nutrition is an economic and an educational as well as a scientific problem.

We now produce a great variety of foods of high quality. The pleasure associated with eating has become more refined. Flavor and keeping quality tend to be emphasized to the neglect of the nutritive values of foods. Processing, packing, and special services have added to food prices. The purchaser rarely knows which portion of his dollar goes for services and which for the food itself. There is little opportunity for obtaining food without these services.

To protect the consumer, the Government has established certain safeguards. As a protection for health, the Food and Drugs Act prohibits the use of certain substances in foods and requires that the presence of others be indicated on the label; as an economic safeguard it requires that foods conform to certain definitions. The Bureau of Animal Industry, through its inspection service, protects the meat supply of consumers. The Bureau of Dairy Industry, in conjunction with the Public Health Service, establishes standards to safeguard the milk supply.

But the final selection of food is an individual and family problem. The science of nutrition now offers a guide to this selection. It shows the importance of food to the well-being of the individual and the community. It tells how to advance this well-being and safeguard health. It offers certain standards in terms of groups of common foods to meet different economic needs as well as different preferences and habits. It is not a substitute for tradition and race experience; it supplements them and corrects them where they need correcting. Education is needed to make this science better known. Agriculture and industry must solve the problems of producing and distributing foods of high nutritive value.