NUTRITION REVIEWS

VOL. 5 JULY, 1947 No. 7

NUTRITION IN HEALTH EDUCATION

The nutritionist in health education has many important responsibilities. These range from an interpretation of the elementary facts of nutrition to problems dealing with international food and economic policies.

The nutritionist should help dispel the bewilderment of many people caused by overemphasis on fragmentary details concerning specific food factors, and insufficient attention to the over-all value of complete nutrition for total health. Overemphasis of a particular vitamin, of one source of iron or another, or of some special packaged form of protein, has given many persons a distorted view of nutritional values. It is the responsibility of the nutritionist in the field of health education to inform the public properly of food as related to total health.

Eating should be a healthful pleasure, not a laboratory experience. It is not necessary for every American to know how many micrograms of vitamin A are contained in his breakfast. The laboratory investigator must continue to expand detailed knowledge, but when the nutritionist presents these findings to the teacher, the nurse, or the general public the details ought to be placed in their true perspective in conjunction with other facts. The knowledge that is conveyed to the ultimate consumer should be dealt with as food values rather than as items in the pharmacopeia.

Civilization has contributed greatly to the cultural advancement of many peoples, but it also has introduced changes of another character which have proved detrimental to their physical well-being. Too often faulty changes in food habits accompany the acquirement of literacy and other refinements in a nation's way of living. When white rice was introduced to the Orient, the populations there were deprived of vital food substances contained in the unrefined rice to which they had grown accustomed as the basic product in their diets. Certain Indian tribes of Canada may have benefited from the cultural point of view when the white man interfered with their habits to raise their standards of living, but they suffered nutritional loss when he took away many of the natural foods and the tonics they had concocted from a variety of herbs that were rich in vitamins. Civilization, then, has a responsibility to see that proper nourishment is provided when it undertakes to alter any people's way of living.

World leaders are now beginning to realize that people are rationed by economic factors and agricultural limitations as well as by an understanding of their needs. They are also recognizing that food intakes often reflect external circumstances rather than fundamental needs and that some of these external circumstances are man-made and can be man-controlled. Consequently, the nutritionist in health education will find his ability to interpret nutritional needs limited by his own understanding of the several factors which have established the food habits prevalent in a particular family or community. The nutritionist in health education is participating not only in an intellectual discipline but also in a social activity, fully realizing that in addition to ignorance there are prejudice, poverty, agricultural practices, and economic policies to play a part in the total picture of malnutrition.

As education influences individuals and groups to an awareness of the part that good nutrition plays in total health, demands will increase for an economy that will make possible adequate food for everyone. As social pressures demand higher nutritional levels of population groups, improved agricultural practices and altered economic policies should follow to make educational factors more effective.

ADELIA M. BEEUWKES
School of Public Health
University of Michigan
Ann Arbor

PRESENT KNOWLEDGE OF VITAMIN-ENZYME RELATIONSHIPS

In the earlier phases of nutrition studies, vitamins were necessarily regarded as rather mysterious food elements which in trace quantities served some essential catalytic role in the body. In a parallel field of biochemistry, that of enzyme chemistry, enzymes were also regarded in a similar way. During the rapid development of the latter field, certain enzymes were found to require coenzymes or "prosthetic groups," and the latter were often revealed to contain components later recognized as vitamins. In more recent years the discovery of new vitamins and their chemical structure has generally preceded the recognition of their function in metabolism. Certainly the knowledge of a given vitamin is incomplete without an understanding of its mechanistic role in metabolism, and such studies now constitute an important segment in the fields of both nutrition and biochemistry. Thusfar several of the B-complex vitam'ns have been recognized as components of enzyme systems, but definitive biochemical roles for many of the other vitamins have not been found.

The recognition of the function of a vitamin offers a basic approach in studies of the detection of nutritional deficiencies. In testing for the sufficiency of a given vitamin, the actual metabolic reaction involving the vitamin might be studied rather than measuring the amount of the vitamin in the blood or tissues. The latter is particularly subject to effects of recent vitamin intake and to interpretation of the significance of these levels to health. Unfortunately the former principle is difficult of application because of the complexities of the chemical reactions usually involved, and because the ideal test would seem to require tissue biopsy samples. Nevertheless the functioning of thiamine has been revealed by measurements of blood pyruvate, and the general principle would seem to be worthy of further study.

Thiamine. Perhaps the earliest recognized metabolic change dependent on a vitamin deficiency was the observation of N. Gavrilescu and R. A. Peters (*Biochem. J.* **25,** *1397* (*1931*)) that the oxygen uptake of thiamine deficient pigeon brain was lowered, and later it was determined that both oxygen uptake and pyruvate removal were accelerated by addition of a thiamine concentrate to such a tissue preparation. The enzyme carboxylase was recognized in 1911 and the need of a coenzyme, cocarboxylase, in 1932. K. Lohmann and Ph. Schuster in 1937 (*Biochem. Z.* **294,** *188* (*1937*)) found that cocarboxylase was the pyrophosphoric acid of thiamine. The coenzyme is now alternatively called cocarboxylase, thiamine pyrophosphate, or diphosphothiamine. It apparently acts in conjunction with several enzymes involved in the metabolism of pyruvate, although it is not known whether the coenzyme itself undergoes a change during its action.

Cocarboxylase can be determined chemically by modifications of the methods commonly applied to thiamine, and by the measurement of carbon dioxide produced during decarboxylation of pyruvic acid by washed yeast preparations. Cocarboxylase is lowered in several tissues in thiamine