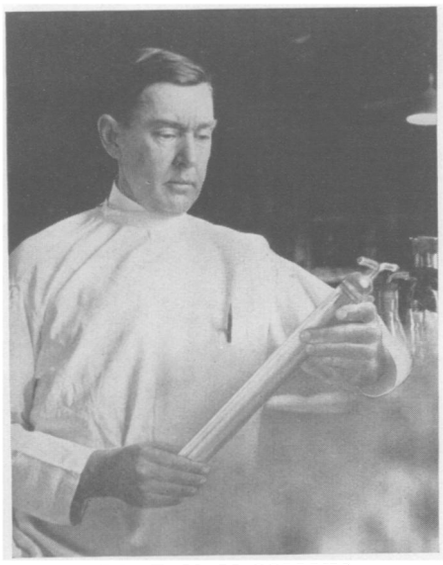
NUTRITION

Protective Foods

"A Classic of Science"

Milk and Leafy Vegetables Keep You Healthy and Young



DR. E. V. McCOLLUM
Nutrition expert, in his laboratory.

THE NEWER KNOWLEDGE OF NUTRITION, The Use of Food for the Preservation of Vitality and Health. By E. V. McCollum. New York, 1918. Copyright 1918 by the Macmillan Co. Reprinted by special permission.

THERE is a wide-spread belief that wheat is superior to the other cereals as a food. There is no experimental evidence that this is true. Rye, barley, oats and maize resemble wheat very closely in their dietary properties, and it is safe to say that these can entirely replace wheat in the diet of children, adults and invalids without the least detriment to health. Those who have become accustomed to the use of wheat bread, are attached to it principally because of habit. Dietary habits become very firmly fixed and are hard to break away from. Millions in the Orient are greatly attached to rice as a food, and feel that they cannot live without it, whereas, we in America cannot bring ourselves to eat liberally of it in the simple and unappetizing form in which it is entirely acceptable in the Oriental. The Italian feels that no diet is satisfactory unless it contains macaroni. Garlic and other flavors which appeal to the appetite of certain peoples are disliked by others. These prejudices and many others are not expressions of physiological need, but are purely demands for something to which we have become accustomed. When properly cooked, cornmeal, oats and other cereals have never been shown to produce digestive disturbances from eating corn. Reports that the people of Belgium, when restricted to the scanty fare which could be furnished them after the occupation of their territory by Germany, suffered from digestive disturbances from eating corn bread, are not to be taken as evidence that the corn products were in themselves responsible for the trouble. They were the sequel of an inadequate diet which impaired the vitality.

Experiments have been described, showing that bolted wheat flour is inferior to whole wheat. If two pigeons are fed whole wheat and bolted flour respectively, while a third is allowed to fast, the first will remain in a state of apparent health for several weeks, the second will lose weight and die earlier than the fasting one. This does not mean that bolted flour is poisonous, but only that it is a more incomplete food than whole wheat. The pigeon which is fed whole wheat will succumb in the course of time, for whole wheat is not a complete food. The pigeon which fasts gradually wastes away, but slowly, because all the tissues decrease in volume and its physiological processes slow down. The bird which is fed the bolted flour dies earlier than the fasted one, because the burden of digesting and metabolizing a liberal intake of food requires that his metabolic processes go on at a rapid rate. When this demand is made upon it and its diet is so incomplete that there can be no repair of its wasted tissues, it wears out the more quickly. Such demonstrations do not constitute an argument against the use of wheat flour as a food. In so far as the latter supplies protein, energy and inorganic salts, it is a good food. What we should realize is that none of our vegetable foods or the meats are complete and ideal foods. Some are more deficient than others, and their deficiencies are not all alike. Satisfactory nutrition is to be attained only through the employment of the right combinations of foods, and in such proportions as will insure that the resulting diet will be properly constituted. We should accept our natural foods for what they are, and make proper use of them, rather than condemn this or that one because it is lacking in some respect.

It is fallacious reasoning to attempt to compare the money value of certain foods with certain others. We may safely compare the cost of the cereal grains or the legumes with each other, or with the tubers such as the potato or the sweet potato, or with the root foods. It is not possible to compare the cost of any of these with milk or the leafy vegetables such as cabbage, cauliflower, Swiss chard, collards, Brussel sprouts, onions, lettuce, celery tops, spinach, turnip tops and other leaves employed as greens. Milk and the leafy vegetables are to be regarded as *protective foods*. In some degree eggs are to be considered in the same class. Milk and the leafy vegetables should be taken in liberal amounts. The leaves should not be regarded as foods of low value because their content of protein, fat and carbohydrate is low, and the content of water high. When compared on the basis of chemical composition they appear inferior to seeds, but they have a peculiar value in their high content of fat-soluble A and of mineral elements, which makes them stand in a class by themselves among the vegetable foodstuffs.

Predictions for Fruits

No thorough studies of the dietary properties of fruits have yet been made, but from their known chemical composition and biological functions as storage organs, their proper place in the diet can be predicted. They are good sources of mineral salts and of energy-yielding foods, the sugars. They are highly palatable and exert a favorable influence on the excretory processes of the kidneys and the intestine. Their liberal use in the diet should be encouraged. . . .

From many questions asked by the public the author has gained the conviction that faulty deductions have been drawn by others from experimental studies, which would lead the inexperienced reader to conclude that by the use of any seed products, or other food-

stuffs of vegetable origin, whose functions are those of storage organs, that diets can be prepared which are so satisfactory as to make it feasible to dispense with a liberal intake of the food-stuffs which we have designated as *protective foods.* These can be shown to be based upon failure to fully appreciate what constitutes a satisfactory demonstration of the adequacy of a diet. Mankind will do well to avoid such diets which may, as Golderger has suggested, place one in "a 'twilight' zone within which a very slight change in any of the dietary components may cause an important shift of balance." . . .

Liberal consumption of all of the essential constituents of a normal diet, prompt digestion and absorption and prompt evacuation of the undigested residue from the intestine before extensive absorption of products of bacterial decomposition of proteins can take place, are the optimum conditions for the maintenance of vigor and the characteristics of youth. Such a dietary régime can be attained only by supplementing the seed products, tubers, roots and meat, which must constitute the bulk of the diet of man, with the *protective foods,* milk and the leafy vegetables.

The results of the study of several representatives of each of the different classes of food-stuffs has led the author to the conclusion that, while it is not desirable to relegate to the background any of the fundamental knowledge of food-stuffs which can be obtained by chemical methods, and by respiration and digestion studies, the fundamental basis of nutrition can best be imparted to the public through the adoption of a biological classification of the natural food-stuffs on the basis of their function. Foods other than milk and eggs of both animal and vegetable origin may be arranged into groups according to whether they represent principally, functioning active protoplasm, or deposits of reserve food material, or in animal tissues, highly specialized contractile tissues. From their biological function their dietary properties can be fairly accurately predicted. This idea, together with the knowledge that milk, eggs and the leafy vegetables, the *protective foods,* are so constituted as to correct the dietary deficiencies of the seeds, tubers, roots and meat, should form the central idea in the teaching of the science of nutrition. . . .