

The nourishing constituents of food may be considered under two main heads:—The albuminoids, sometimes called "protein," "proteids," or "nitrogenous compounds," are those which contain about sixteen per cent of nitrogen. They get the name albuminoids from a typical albuminoid, well-known to us as albumen, the main constituent in the white of eggs. Albumen is also a constituent of milk. It composes the thin film which is coagulated when milk is heated above scalding point. The albuminoids are the "flesh-formers" in foods; and, while they may be consumed to produce heat in the body, their main function is to nourish and repair the muscles, nerves, skin, and other parts of the body which contain nitrogen.

In contradistinction to the albuminoids are the "heat producers." These are the carbohydrates and fats of foods. They are the starch, sugar and gums which are obtained in vegetables, cereals, fruits, etc., and the fat which we obtain in the form of the fat of meat, the butter-fat of milk, or the oils from grains and other plant sources.

The term "nutritive ratio" is the one used to denote the proportion of albuminoids or flesh-formers in food to the sum of the other nutrients in the food. The heat-producing or fuel value of fat in food is two-and-a-quarter times as great as that of carbohydrates, such as starch and sugar, and also two-and-a-quarter times greater than albuminoids.

That the "flesh-forming" and "heat-producing" parts of our food should be in correct proportion to each other is important for the health and well-being of the race. In the food of the well-nourished peoples of Europe the proportion is about 1 of the "flesh-forming" to 4 of the "heat-producing," or 1 to 4. In the diet of Americans the ratio is usually from 1 to 6½, or from 1 to 8 or 9. In our experimental work in the feeding of animals we find that it is never economical to feed animals which are being kept for profit through increase in weight or the production of milk upon a ration which has a very wide nutritive ratio. In the fattening of swine upon foods with a wide nutritive ratio, such as would exist in Indian corn, a very much greater proportion of lard or fat to the lean meat is produced in the animals, than when similar animals are fed upon a diet containing a larger proportion of flesh-forming material, as in ground peas, oats, barley or wheat, with a little skim milk. The vigour, healthfulness, and apparent contentment of the animals, as well as their profit yielding capacity, are in a large measure determined by the proportion which these two classes of nutrients bear to each other, as well as to the palatability and digestibility of the food which is consumed. I think that the same principle might correctly and beneficially be applied for the guidance of people in purchasing and preparing food for themselves. We have been studying on the experimental farms the best methods for supplying plant-food to plants, in order that they may give us the most desirable returns in quality, size and appearance. We have been carrying on extensive experiments upon the methods of feeding domestic animals to discover what foods yield the best increase in live weight, or through the giving of such products as milk. I think the Department of Agriculture might carry the investigations a step further and provide for an examination of the most economical and beneficial foods for nourishing the people through these plants and animals which are grown and fed for that ultimate purpose. It does not seem wise to stop this investigation at a point where they might, by being continued, become capable of rendering the largest, widest and most lasting service to the people. Information of this nature is what would help to make the nation stronger in the physique and personality of its people, as well as richer in the realizations from its resources. This is one reason why I believe in promoting the making of good butter and fine cheese. These have high values as foods, and can be easily used with other portions of our diet to make well-balanced and nutritious meals at a low cost to the people. If you look for a moment at the chart, you will observe that oatmeal and milk are among the best balanced foods that can be obtained, particularly during the growing period of life, and they have the decided advantage of being cheap. I have observed the diets of some of the people of Canada, who cannot afford to buy extravagantly or carelessly, and I find that I can buy for twenty-five cents considerably more nourishing food than many of these poor people, who do not know anything about the nutritive value of foods, buy for one dollar.