

Moisture. Every one of the foods under discussion, no matter how dry it may appear, contains some water which can be driven out by heat. A high water content is not desirable, because it not only diminishes the percentage of actual food material, but it also tends to cause the food to mould or turn sour. Water has certain physiological functions to perform in the body, but it may be supplied from so many sources that it has no particular value as a food.

Protein is the name commonly given to a class of substances which furnish the materials for the formation of bone, flesh, blood, etc. This constituent is absolutely essential in the food of animals; for, without it, no animal can grow or even subsist. Moreover, the animal is totally unable to create protein; that is a function of plant life. The animal can simply appropriate and transform the protein of plants into the particular proteids of the body. Protein, when oxidized or burned in the body, will produce heat, and if eaten in excess of that required for other purposes, may form fat. Altogether protein is one of the most important constituents of a food, and the one which is the most expensive. Hence we naturally like to find a food rich in this substance.

Fat, or ether extract, is that part of the food which may be extracted from the water-free material by ether, benzine, gasoline, etc. It is of value for the formation of fat in the body and for the production of energy and heat. For this latter purpose it has more than twice the value of protein and carbohydrates. Fat may, therefore, be looked upon as a concentrated heat producer.

The Soluble Carbohydrates, or nitrogen-free extract, consist mainly of starches, sugars, and closely allied compounds. In the cereal breakfast foods these soluble carbohydrates form about two-thirds of the whole material. Their particular function in the body is to form fat, or, when oxidized, to produce heat and energy. They are frequently called the energy or heat producers.

Crude Fibre is the term applied to a group of substances which form the woody or straw-like frame-work of plants. It is so indigestible that it has almost no food value, and, further, it frequently renders the rest of the food less digestible by protecting it from the action of the digestive fluids. Therefore, a large amount of it in a food is not desired. Yet, it is undoubtedly physiologically useful in giving the needed bulk to the food.

Ash is the inorganic or mineral part of foods. It is of great importance in the food of the young, as it furnishes the phosphates, chlorides, and other salts of calcium, magnesium, sodium, potassium, iron, etc., which are needed in building up the bones and the tissues of the body.

Heat of Combustion. The various nutrients above referred to when supplied in the food enable the body to grow and to repair its tissues as they are worn out in the necessary exercise of the body functions. They also supply the body with the energy needed for doing work both internal and external, and furnish the heat to keep the body warm. All the nutrients, except the ash, may be oxidized or burned in the body, and are,