

Nutrition for Nurses

Nutrition and Human Welfare

By

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What Food Does For Us

Everybody knows that living things cannot exist without food. When food is not available, they waste away. The kinds of food which people eat in different countries often differ greatly. Even in the same country, we find different dietary habits in different districts. Nevertheless, regardless of the kind of diet a person may eat, it must contain adequate quantities of the food-stuffs to fulfil his nutritional needs, so that he can be healthy. In order to understand the types and quantities of foods which will satisfy one's nutritional needs, we should learn how food works in the body.

Through food the body obtains substance which enter its structure, which yield energy for its activities and which regulate the processes essential to life and to health. Food is defined as anything, solid or liquid, which when swallowed, digested and assimilated, nourishes the body in the following ways :

1. Furnishing the body fuels from which the body can produce by oxidation, heat, work or other forms of energy for its activities. A railway engine needs coal to make it go and a car needs petrol to work. The coal and petrol give energy which drives the train or car along the rails or road. The body also needs a supply of energy to make it go. Some part or other of the body is always working : the heart beats, the chest walls move for breathing and digestion goes on. For all these purposes food is necessary to give energy and heat.

2. Providing materials for building and growth of body tissue, their repair, upkeep and reproduction.

3. Supplying substances for the

formation of enzymes and hormones by which the various conditions and processes of the body are regulated.

A nutrient is a substance which functions in any of the above three ways. Some nutrients function in more than one way. The science of nutrition teaches us how the nutrients supplied by food affect the growth, maintenance and repair of the living body.

In order to understand nutrition, it is necessary to know something about the functions of the living body as a whole—its physiology, structure and anatomy because in recent years we have realised that food is not all that there is to nutrition, through the finding that some people who do get plenty of nutrients are still not properly nourished. Such people must be suffering from some bodily dysfunctions. Therefore nutrition should be considered from the standpoint of the body as a whole in its relation to food.

Shortage of essential nutrients makes a difference in our health and well-being. If there is a wrong proportion of one or other nutrient, a condition of malnutrition will occur. If the total amounts of nutrients, provided by the diet are insufficient, the resulting condition will be under-nutrition, whose extreme case is starvation. Eating more than one needs will also lead to malnutrition such as obesity. Health may be disturbed by several types of nutritional disorders :—absence or presence in small quantities of nutrients ; lack of capacity to digest or metabolise ; loss in cooking and lack of desire to eat. The symptoms of ill-health or pronounced physical ailments caused by inadequacy of essential nutrients are called nutritional deficiency diseases.

The Constituents of Food

The human body contains almost all the elements found in the foodstuffs. It is estimated that in the body of a woman of average size there are :

- Nine gallons of water,
- Enough oxygen to fill eight nine gallon barrels,
- Enough carbon to make good graphite pencils,
- Enough phosphorus to make good boxes matches,
- Enough hydrogen to inflate a balloon capable of raising the whole body to the top of Snowdon,
- Enough iron to make fine tacks,
- Enough salt to fill 6 ordinary salt cellars, and
- 4-5 pounds of nitrogen.

All the above substances are provided through food, air and water. There are several ways of classifying the foods we eat. One such classification is based on the chemical composition of foods and divides the nutrients into the following groups :

I. The energy giving nutrients :

- (a) carbohydrates
- (b) fats
- (c) proteins

II. The regulatory Nutrients.

- (d) vitamins

III. The Inorganic nutrients.

- (e) mineral salts
- (f) water.

Carbohydrates. Carbohydrates are the nutrients made up of the chemical elements, carbon, hydrogen and oxygen. The ratio of oxygen to hydrogen in carbohydrates is as that in water. Carbohydrates give the body energy necessary for muscular contraction, glandular suction and for maintaining the warmth of the body.

Carbohydrates consist chiefly of sugars, starches and celluloses. Sugars are soluble in water while the others are not. They are classified as follows :

1. **Monosaccharides.** (Simple sugars or mon sugars) : As the name indicates these are the simplest of the sugars. They are three in number, glucose, fructose, and galactose. Glucose is derived from the splitting of starch or maltose. It is half as sweet as cane sugar, and is widely distributed in nature especially in fruits. When cane sugar is broken, both glucose and fructose are obtained. On the other hand, lactose (milk sugar) gives galactose and glucose on hydrolysis. Fructose is fruit sugar and is slightly sweeter than glucose and occurs along with it in ripe fruits and honey.

2. **Disaccharides** (Double Sugars) : Under this category come canesugar (sucrose), milk sugar (lactose) and malt sugar (maltose). Cane sugar is obtained from cane or beet, fruits and vegetables. It is a highly refined food. Jaggery, when refined to give white cane sugar is depleted of some of its vitamins and minerals.

Maltose is formed naturally from starch during the germination of grains. It is an intermediary substance produced in the change of starch into glucose. Lactose is found in the milk of all mammals. It has a slightly sweet taste. It has a mild laxative effect on the intestine.

3. **Polysaccharides** (Complex Sugars): Starches, glycogen, dextrins, celluloses and related materials belong to this group. Starch is stored as reserve food in the various parts of plants, green leaves and tubers. While the starchy granules are insoluble in cold water they become partly or wholly soluble in boiling water or when acted upon by digestive enzymes. Starch forms the largest proportion of carbohydrates in human food. More than half the solid matter in cereals and potatoes is starch. Starch is made up of a large number of glucose units combined chemically. Starch granules cannot be easily digested and therefore foods like maida flour, potatoes, rice ragi and millets cannot be eaten uncooked. When they are heated in water, they swell, burst, and release the starch.

Dextrin is the intermediate substance formed when starch is converted into glucose in digestion. It is gummy in

nature and partly soluble in water.

Glycogen or 'animal starch' is found in the liver and the muscles of animals. Carbohydrates are stored in the body in this form. When glycogen is released from the liver it is re-converted into glucose.

Cellulose and related materials are the stiffer substances of vegetables. They are fibrous and form the framework of plants. Although celluloses are formed by a combination of sugar molecules, they are not readily digested by human beings, and therefore have no direct nutritive value for them. They form the major part of the residue which is necessary for normal intestinal movement (peristalsis). Celluloses act as a mechanical stimulus to the intestinal movement and also help to retain moisture in the faeces. They give bulk to the diet and hence to the faeces.

Foods which Contribute carbohydrates to the diet : Except in the case of a few foods like sugar which has nearly 100 percent carbohydrate all foods in nature contain more than one nutrient. Consequently a food like atta (wheat) although it ranks high as a source of carbohydrate, contains also good amounts of protein and other nutrients.

The figures below represent the number of gram of available carbohydrate from an ounce of certain foods. (28.4 grams are equivalent to one ounce).

1. Foods which supply more calories and less vitamins and minerals :

	Grams/ounce
Sugar	27.0
Jam	17.6
Maida	21.0

Oatmeal	18.6
Bread (white)	15.5
Sago	24.7
Polished rice (raw)	22.0

2. Foods which supply calories along with minerals and vitamins :

	Grams/ounce
Whole wheat flour	20.5
Green peas	2.7
Green beans	1.5
Ghal arhar	16.2
Potatoes	4.2
Partboiled rice	22.5
Beet root	2.3
Raisins	16.5
Dates	16.3
Bananas (peeled)	4.9
Apples	3.0
Pineapple	3.0
Oranges	2.2

Functions of Carbohydrates in the Diet :

Besides giving the energy necessary for the various functions in the body carbohydrates spare proteins and therefore make the diet less expensive. When in excess, they are converted into fats and stored in the body. Obesity predisposes the body to conditions like high blood pressure, cardiac and renal diseases and diabetes. They prevent hypoglycemia and ketosis by exerting their favourable influence. They are quickly converted into energy and heat by the body.

Refined carbohydrates do not have enough of the vitamins B, in them, necessary for their metabolism. Dentists are of opinion that excess carbohydrates, particularly the refined ones encourage dental decay.

(To be Contd).

THANKS

To my several hostesses and friends go my warmest thanks for the many kindnesses and hospitality extended to me during my tour.

To Members in Assam : I was most disappointed that the weather and the disrupted air services prevented me from proceeding beyond Gauhati. The need to cancel my programme was a matter of considerable regret.

Lakshmi Devi
General Secretary