

Classes of Nutrients

To be healthy, our bodies need nutrients from five different groups of essential nutrients: Proteins, Carbohydrates, Fats, Vitamins and Minerals. These nutrients support growth and maintenance of health, provide energy, and keep body functions running smoothly.

Calories - A kilocalorie or calorie is a unit of heat measurement. One calorie is the amount of heat necessary to raise the temperature of one kilogram of water 1°C.* When we say we're "burning" calories, we're really using up the caloric energy value in the food we've eaten. Carbohydrates yield four calories per gram, proteins yield four calories per gram, and fats yield nine calories per gram. You can see that fat on a weight basis yields more than twice the energy per gram compared to carbohydrates and proteins. But since the body uses carbohydrates for energy, and carbohydrate foods also provide other nutrients, you should try to meet your energy needs with carbohydrates rather than fats.

Carbohydrates - Carbohydrates fuel the body with energy. Simple carbohydrates (also called simple sugars) such as glucose and fructose from fruits and vegetables fuel red blood cells and the brain.* Simple carbohydrates are connected together to form more complex structures including starches, fiber and other complex carbohydrates. When the body needs extra energy, it can break down complex carbohydrates into simple glucose for more energy. Fruits, vegetables, grains and pasta are high in complex carbohydrates, and health authorities recommend we boost carbohydrate intake to 55-60% of calories consumed.**

Fiber is a complex carbohydrate that comes from plant foods such as whole grains, fruits and vegetables. There are two types of fiber: insoluble and soluble. Insoluble fiber cannot be broken down by our body. It provides bulk in the intestines which helps keep them in top working condition. Soluble fiber, on the other hand, can be broken down by the body. This fiber works like a sponge to absorb toxic substances and prevent them from entering the bloodstream.

Proteins - Proteins help the body to grow and maintain itself, allowing it to perform vital functions such as cell repair, blood clotting and enzyme production. Proteins are made up of amino acids, and the body needs 20 different kinds of them to function. Eleven are considered non-essential because our bodies make them. The nine we do need to consume are called essential amino acids, and when we consume a balance of them, our bodies can synthesize or make "complete" protein.

Fats - Fat is an essential part of all cells. It aids the immune system, transports fat-soluble vitamins, helps form cell membranes and insulates body organs. Fatty acids, which are part of the structure of fats, differ from each other in their chemical makeup. At room temperature, saturated fatty acids usually form solid fats, whereas polyunsaturated and monounsaturated fatty acids remain as liquid oils. Our bodies need the equivalent of only about 1 tablespoon of polyunsaturated plant oil (corn, soybean, and safflower oils) a day because it provides the essential fatty acids which the body cannot make. The American Heart Association recommends limiting fat to 30% of your total calorie intake.** It is important to limit our fat intake since a diet high in fat contributes to obesity, coronary heart disease and other health problems.

Vitamins and Minerals - Vitamins are chemical compounds that yield no energy, but are essential for many physiological functions. Vitamins contribute to energy-yielding chemical reactions in the body and promote growth and development. Minerals also play an important role in maintaining vital body functions. For example, the mineral copper enables enzymes to function; iron is a component of hemoglobin in red blood cells; and minerals such as sodium, potassium, and calcium aid in the transfer of nerve impulses throughout the body.**

*National Research Council, Recommended Dietary Allowances, 10th Ed., National Academy Press, Washington D.C., 1989.

**Wardlaw Ph.D., Gordon M., Contemporary Nutrition, Mosby Year Book, St. Louis, 1994.

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