

## What is Nutrition?

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Nutrition is the provision, to cells and organisms, of the materials necessary (in the form of food) to support life. Many common health problems can be

prevented or alleviated with good nutrition.

The diet of an organism refers to what it eats. Dietitians are health professionals who specialize in human nutrition, meal planning, economics, preparation, and so on. They are trained to provide safe, evidence-based dietary advice and management to individuals (in health and disease), as well as to institutions.

Poor diet can have an injurious impact on health, causing deficiency diseases such as scurvy, beriberi, and many others; health-threatening conditions like obesity and metabolic syndrome, and such common chronic systemic diseases as cardiovascular disease, diabetes, and osteoporosis.

## Overview

Nutritional science investigates the metabolic and physiological responses of the body to diet. With advances in the fields of molecular biology, biochemistry, and genetics, the study of nutrition is increasingly concerned with metabolism and metabolic pathways, the sequences of biochemical steps through which the many substances of living things change from one form to another.

The human body contains chemical compounds, such as water, carbohydrates (sugar, starch, and fiber), amino acids (in proteins), fatty acids (in lipids), and nucleic acids (DNA/RNA). These compounds, in turn, consist of elements such as carbon, hydrogen, oxygen, nitrogen, phosphorus, calcium, iron, zinc, magnesium, manganese, and so on. All of these chemical compounds and elements occur in various forms and combinations (e.g. hormones/vitamins, phospholipids, hydroxyapatite), both in the human body and in organisms (e.g. plants, animals) that humans eat.

The human body consists of elements and compounds ingested, digested, absorbed, and circulated through the bloodstream. Except in the unborn fetus, it is the digestive system which carries out the first steps in feeding the cells of the body. In a typical adult, about seven liters of digestive juices enter the lumen of the digestive tract. They break chemical bonds in ingested molecules and modulate their conformations and energy states. Though some molecules are absorbed into the bloodstream unchanged, digestive processes release them from the matrix of foods in which they occur. Unabsorbed matter is excreted in the feces.

Studies of nutritional status must take into account the state of the body before and after experiments, as well as the chemical composition of the diet and the products of excretion. Comparing the food to the waste can help determine the specific compounds and elements absorbed in the body. Their effects may only be discernible after an extended period of time, during which all food and waste must be analyzed. The number of variables involved in such experiments is high, making nutritional studies time-consuming and expensive, which explains why the science of human nutrition is still slowly evolving.

In general, eating a wide variety of fresh, whole (unprocessed) foods has proven favorable compared to monotonous diets based on processed foods. In particular, the consumption of whole plant foods slows digestion and provides higher amounts, and a more favorable balance, of essential nutrients per Calorie, resulting in better management of cell growth, maintenance, and mitosis (cell division), as well as better regulation of appetite and blood sugar. Regularly scheduled meals (every few hours) have also proven more wholesome than infrequent, haphazard ones