

## Nutrition (The basics)

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Today the average consumer in the street is concerned about the food he/she eats but often has little knowledge of nutrition beyond the day's headlines. Here we will introduce the key parameters of nutrition and provide some nutritional guidelines for leading a healthier life.

Nutrition science deals with foods in relation to health. It examines the way in which an organism assimilates and uses foods and liquids for normal functioning, growth and maintenance and to protect and optimise health. It addresses a broad scope of topics from interest in clinical diseases caused by single nutrient deficiencies such as scurvy (lack of vitamin C), to emphasis on more complex conditions such as heart disease, diabetes and osteoporosis. Nowadays nutrition science includes "prevention of disease" in which nutrition plays a key role.

### What should I eat?

Most people are unsure whether certain foods are good or bad for them.

To sort out this confusion it helps to keep in mind three key points about the science of nutrition. The first is that studying nutrients' effects on the complicated functional systems of the human body is difficult. The second is that most consequences of the diet are built up over many years, much longer than the duration of most scientific studies. Consequently, results must be extrapolated to life-long situations, and this, of course, increases the risk of errors. Finally, many so-called western diseases are so complex that it is unlikely that a single factor is responsible for their development.

Confusion also arises from a communication gap between scientists and the public.

Even without a deeper examination of nutrition science, there are a few simple rules that can help determine whether or not to change eating habits when faced with a new nutritional "finding". The most fundamental is not to jump to general conclusions, to be sure of the facts and the context. Before changing lifelong eating habits, wait for the confirmation of reports or opinions and follow the advice of experts in a broad range of scientific fields.

### Nutrients

Foods are derived from both plants and animals, and most foods are complex mixtures of different components. They contain energy and nutrients to help the body grow, maintain and repair itself. They contain water, without which life would not exist, and many ingredients to help the body function normally. Finally, foods also contain a very large number of components that affect texture, colour and flavour, making foods appealing and, therefore, pleasant to eat.

The word 'nutrient' is a broad term to describe all dietary substances used by the body to ensure normal development and maintain good health. The term, however, can be divided into two distinct groups of dietary components:

- macronutrients and
- micronutrients

Macronutrients are proteins, lipids (fats), and carbohydrates. They are the principal ingredients of the diet and are either the basic material from which the body is built (proteins and fats normally constitute 44% and 36% of the dry weight of the body, respectively), or the fuel required to run it (carbohydrates and fats ideally supply about 55% and 30% of our energy, respectively).

Water is also a macronutrient, but because we do not obtain any 'nourishment' from it (neither energy nor other essential components), it is often not considered as such. It is, however, the most important constituent of our body, quantitatively and qualitatively. Not only does water account for around 60% of our total body weight, it is also the component that we can afford to lose the least of. Generally, a loss of only 8% of our body water (about four litres) is sufficient to cause serious illness. This compares with about 15% for protein, the next most important, and up to 90% of fat, the least important.

Micronutrients, in contrast, provide virtually no energy but are the essential cofactors for metabolism to function. Micronutrients are primarily vitamins (e.g., vitamins A, B, C, D, E, and K), minerals (such as calcium and phosphorous), and trace elements (such as iron, zinc, selenium, and manganese).

Although these are required in very small amounts in the diet, they are nevertheless key dietary components. The processes of growth, energy production, and many other normal functions would not occur without them.

Requirements for nutrients differ at different ages and stages; for example, during rapid adolescent growth and during pregnancy, people need extra protein and minerals.

Health, consequently, is related to an optimum supply of both macronutrients and micronutrients. Insufficient or excess intake of either can lead to problems. In the world today, the main nutritional issues are primarily related to excess intake of macronutrients or insufficient intake of micronutrients.

## Nutrition in everyday life

People are living longer than ever before. The average life expectancy in the mid 19th century was 40 years, today it is almost 80. Along with better hygiene and the advancement of medical care, there is no doubt that dramatic improvements in the availability, quality and safety of the food supply have contributed to this remarkable progress. But living longer can become a burden if the years gained are spent in sickness rather than in health. So what is the contribution of nutrition to both a long and healthy life?

Eating is not just for nourishment, it is one of life's great pleasures. A food will not do anyone any good unless it is eaten. All five senses contribute to the eating experience:

- Taste - Sweet, sour, salt, bitter, umami (meat flavour)
- Smell - smoky, spicy, fruity
- Sight - Expectation - colour, size, shape, appearance
- Touch - Lips, mouth and throat feel - firm, moist, smooth
- Sound - The noise of food being eaten - crunchy, sizzling

Food also contributes to our enjoyment from a social point of view. Sharing a meal is a great way to relax and strengthen social bonds. Food also plays a part in our cultural identity. Traditional dishes, meals and festive foods vary between countries, regions and religions. Enjoyment and the social and cultural aspects of eating contribute to our long-term well-being as well as the basic nutritional components.

Each food or dish contains a different mix of nutrients, and it is the way foods are combined to make up the whole diet that is important. In addition, different people have different energy needs. Very active people - athletes, those with physically active jobs - need lots of energy from food. People who are less active or who have sedentary jobs need less energy. Men usually need more energy than women and adults need more than children. Because of this immense diversity in the composition of foods and the broad range of needs for balanced nutrition, no single food can supply all the essential nutrients, apart from human milk for infants. Therefore, one of the most fundamental principles of healthy eating is variety: the need to consume a broad range of foods on a regular basis. It is what is eaten in combination and over a period of time - at meals, in snacks, over a day or a week - that is really important. For example, a meal that is low in a particular nutrient can be balanced by one richer in that nutrient on another occasion. Balance is achieved over time. It is the combinations of foods and whether they cover the needs of the particular individual that determine whether a diet is "good" or "bad". The differences in food habits between nations demonstrate that there are many routes to a healthy food mix.