NUTRITION

Food provides energy (as calories) and materials called nutrients needed for growth and renewal of tissues. Protein, carbohydrate, and fat are the three major nutrient components of food. Vitamins and minerals are found only in small amounts in food, but are very important for normal function of the body. Fibre, found only in foods from plants, is needed for the digestive system to work well.

During digestion, large molecules of food are broken down into smaller molecules, releasing nutrients that are absorbed into the bloodstream. Carbohydrate and fat are then metabolized by body cells to produce energy. They may also be incorporated with protein into the cell structure. Each metabolic process is promoted by a specific enzyme and often requires the presence of a particular vitamin or mineral.

Why drugs are used

Dietary deficiency of essential nutrients can lead to illness. In poorer countries where there is a shortage of food, marasmus (resulting from lack of food energy) and kwashiorkor (from lack of protein) are common. In the developed world, however, excessive food intake leading to obesity is more common. Nutritional deficiencies in developed countries result from poor food choices and usually stem from a lack of a specific vitamin or mineral, such as in iron-deficiency anaemia.

Some nutritional deficiencies may be caused by an inability of the body to absorb nutrients from food (malabsorption) or to utilize them once they have been absorbed. Malabsorption may be caused by lack of an enzyme or an abnormality of the digestive tract. Errors of metabolism are often inborn and are not yet fully understood. They may be caused by failure of the body to produce the chemicals required to process nutrients for use.

Why supplements are used

Deficiencies such as kwashiorkor or marasmus are usually treated by dietary improvement and, in some cases, food supplements, rather than drugs. Vitamin and mineral deficiencies are usually treated with appropriate supplements. Malabsorption disorders may require changes in diet or long-term use of supplements. Metabolic errors are not easily treated with supplements or drugs, and a special diet may be the main treatment.

The preferred treatment of obesity is reduction of food intake, altered eating patterns, and increased exercise. When these methods are not effective, and the body mass index (BMI) is 30 or more, an anti-obesity drug may be used.

Major food components

Proteins
Vital for tissue growth and repair. In meat and dairy products, cereals, and pulses. Moderate amounts required.

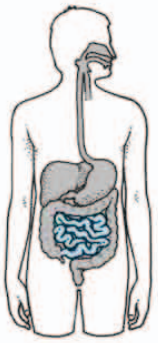
Carbohydrates
A major energy source, stored as fat when taken in excess. In cereals, sugar, and vegetables. Starchy foods preferable to sugar.

Fats
A concentrated energy form that is needed only in small quantities. In animal products such as butter and in plant oils.

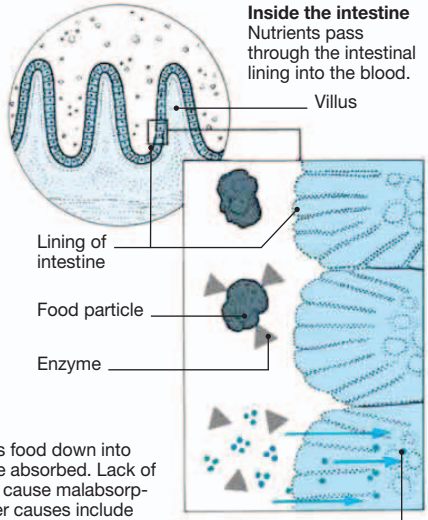
Fibre (non-starch polysaccharides)
The indigestible part of any plant product that, although it contains no nutrients, adds bulk to faeces.

Absorption of nutrients

Food passes through the mouth, oesophagus, and stomach to the small intestine. The lining of the small intestine secretes many enzymes and is covered by tiny projections (villi) that enable nutrients to pass into the blood.



Small intestine



Inside the intestine
Nutrients pass through the intestinal lining into the blood.

Malabsorption
Enzyme action breaks food down into molecules that can be absorbed. Lack of certain enzymes may cause malabsorption of nutrients. Other causes include flattened villi and scars on the intestine.

MAJOR DRUG GROUPS

Vitamins