

Nutrients are chemical substances in food that nourish the body by providing energy, building materials, and factors to regulate needed chemical reactions.

Essential nutrients must be provided by food because the body does not produce them in sufficient quantities or cannot make them at all. Shortage of any one of them leads to the compound's deficiency.

Nonessential nutrients can be taken from food, and healthy, well-nourished bodies can make them in sufficient quantities to satisfy their needs.

Nutrients functions :

- ❑ Energy source
- ❑ Building tissues
- ❑ Regulating metabolic processes

❑ Essential nutrients consist of :

- ❑ 15 Vitamins
- ❑ 25 minerals
- ❑ Water

Glucose and essential fatty acids : linoleic acid (omega-6) and linolenic acid (omega-3)]

- ❑ Some proteins

Nutrients are classified into :

- ❑ Macronutrients (carbohydrates, fats, and proteins).
- ❑ Micronutrients (vitamins, minerals, and water).

Some Dietary guidelines :

- ❑ Eat a variety of foods.
- ❑ Maintain a healthy weight.
- ❑ Choose a diet low in fat, saturated fat, and cholesterol.
- ❑ Choose a diet with plenty of vegetables, fruits, and grains
- ❑ Use sugars only in moderation.
- ❑ Use salt and sodium only in moderation
- ❑ Components of a nutritional assessment :
 - ❑ Historical data (24-hour recall, FFQ)
 - ❑ Anthropometric measurements (height, weight, BMI)
 - ❑ Clinical assessment (physical examinations).
 - ❑ Biochemical analyses (laboratory

There are 6 categories of nutrients :] Carbohydrates] Lipids] Proteins] Vitamins] Minerals] Water

Glycemic index : Relative ability of different dietary carbohydrates to raise
blood glucose levels

- ❑ Types of Fat :
 - Saturated
 - ❑ Monounsaturated
 - ❑ Polyunsaturated: omega 3, omega 6.

Vitamins are organic compounds that have several functions.

Water- soluble vitamins

Fat-soluble vitamins (A, D, E and K)

Anti-oxidants : (Anti-carcinogenic , Anti- fat oxidation)

3 Vitamins :

Vitamin A

Vitamin E

Vitamin C

1 Mineral :

Selenium

Minerals: inorganic compounds.

Macrominerlas (need it in mgs)

Microminerals (in micro-grams)

Ultratrace Minerals (very little amount)

Calcium :

Has intestinal absorption

Renal excretion

Skin losses

Serum calcium

Blood calcium and parathyroid hormone

Role of other hormones

Functions :

Strengthen the bone mass. (bone mass is measured using
DEXA)

Maintain bone health

Transport functions of cell membranes

Nerve transmission

Regulation of heart muscle function

Blood clotting

Role in obesity

Found in Milk groups and dark leafy vegetables.

Deficiency :

Lower peak bone mass

Increased blood PTH levels leads to low

bone mass

Osteomalacia

Chronic diseases

Phosphorous :

A role in Calcium metabolism.

In RNA and DNA

Found in: Meat & Poultry, Cereals.

Magnesium :

Cofactor for more than 300 enzymes

Important in Neuromuscular transmission and bone.

Sulfur:

Constituent of three amino acids: cystine, cysteine, and methionine

Microminerlas : Iron

Heme and non-heme

Ferritin carries bound iron

Role :

Hemoglobin synthesis (heme + big globin protein)

Red blood cell function

Myoglobin activity

Immune function

Found in: liver, whole grains, cereals, dry fruits, lean, meat and poultry.

Deficiency : Hypochromic, microcytic anemia

Iron overload: Hemochromatosis (precipitation in lungs) or Hemosiderosis.

Zinc

Deficiency

Decreased taste acuity

Delayed wound healing

Growth retardation (esp. reproductive organs), Length andstature is affected. "cretinism"

Immune deficiencies

Skin lesions

Found in: Met, fish, poultry and nuts.

Fluoride :

For the health of the bones.

Deficiency: dental caries.

Copper :

Found with Zinc (Copper-Zinc superoxide dismutase, Ceruloplasmin)

Found in: shell-fish, organ meats and chocolate

Iodine :

In thyroid gland

Synthesis of T3 , T4

Deficiency:

Endemic goiter

Cretinism

Hypothyroidism

Hyperthyroidism

Selenium is important in iodine metabolism.

Found in: Iodized salt and seafood.

Selenium :

Anti-oxidant (free radical)

Deficiency: Keshan disease (in Chinese people): heart muscle

failure and cardiomyopathy.

Found in: Seafood, meat, poultry, liver and Kidney.

Manganese :

Activates many other enzymes

Formation of connective and skeletal tissues

Cobalt :

Component of B12.

Deficiency : Macrocytic anemia

Nutrient	compound Kcal\g given when burned in the body
Carbohydrates	4 kcal\g
Proteins	4 kcal\g
fats	9kcal\g
alcohol	7kcal\g