

- b. **Legumes (Plate 1):** Beans, peas, lentils, etc.
- c. **Nuts (Plate 2):** Ground nut (peanut), cashewnut (kaju), coconut, etc.
- d. **Oilseeds:** used to produce oils—sunflower, flaxseed, rapeseed, etc.

Fruit: Fruits are the ripened ovaries of plants, including the seeds within it. There are varieties of fruits eaten by humans available in the world, e.g. apple, orange, grapes, banana, etc. Availability varies from region to region. Fruits make up a significant part of the diets of most cultures.

Some botanical fruits such as tomatoes, pumpkins, and eggplants are eaten as vegetables.

Vegetables: Vegetables are commonly eaten by humans as food. These include:

- a. **Green leafy vegetables:** Cabbage, spinach, lettuce, etc.
- b. **Root vegetables:** Carrots, beetroots, turnip, etc.
- c. **Tubers:** Potato, onion, garlic, etc.
- d. **Other vegetables:** Cauliflower, brinjal, bitter gourd, etc.

Animal source: Animals are used as food either directly or indirectly by the products they produce.

Meat: Meat is an example of a direct product taken from an animal.

Food products: Food products produced by animals include:

- a. Milk
- b. **Dairy products:** Cheese, butter, etc. produced from milk.
- c. Eggs
- d. **Honey:** A reduced nectar from flowers, which is a popular sweetener in many cultures.

Although humans are omnivores, some cultures and people do not consume meat or animal food products for cultural, dietary, health, ethical, or ideological reasons.

Vegetarians choose to forgo food from animal sources to varying degrees. **Vegans** do not consume any foods that contain ingredients from an animal source.

Current basic five food groups are:

- Grains (Plates 1 and 2)
- Vegetables (Plates 3 and 4)



Deficiency and Excess

Deficiency: Nearly 30% of the world's population has insufficient iodine intake; these individuals are at high risk for the following deficiency diseases.

- ❑ **Goitre:** Goitre develops due to deficiency of iodine; it is more prevalent in the mountainous area. Goiter may also occur due to presence of goitrogens in food. Most important dietary goitrogens are cyanoglycosides and thiocyanates. They interfere with iodine utilization by the thyroid gland. Vegetables like cabbage, cauliflower, radish, etc., may contain goitrogens.
- ❑ **Cretinism:** Cretinism is a congenital disorder resulting from insufficient thyroid hormone to the fetus during gestation which may be due to maternal iodine deficiency throughout pregnancy. Cretinism is characterized by physical deformity, dwarfism, mental retardation, and auditory deficit.
- ❑ **Hypothyroidism:** Iodine deficiency is the most common cause of hypothyroidism worldwide.

Excess: Excess iodine supplementation may lead to thyrotoxicosis or iodine-induced hyperthyroidism.

DAILY REQUIREMENTS OF NUTRIENTS

Daily requirements of nutrients for an adult of average body weight are given in **Table 2.15**.

Nutrients	Daily requirement
Carbohydrates	400 g or 60% of the total calorie
Proteins	1 g per kg body weight or 65 g
Fats/oils	20 g
Fibers	10–12 g
Vitamins	
Vitamin A	600 µg retinol
Vitamin D	400 IU
Vitamin E	10 mg
Vitamin K	120 µg

Contd.

Diet means a dietary regime (i.e. kinds of food) that a person or community habitually eat or restrict themselves for weight management or other medical or religious reason.

A healthy diet may maintain optimal health, which should contain all constituents of food (carbohydrate, protein, fat, vitamins, minerals and water) in appropriate proportion and adequate amount, i.e. balanced diet.

Some cultures and religions have restrictions concerning what foods are acceptable in their diet. Many people choose to forgo food from animal sources to varying degrees (e.g. flexitarianism, vegetarianism, veganism, fruitarianism).

Diet has an impact on weight and disease; so there are several types of diet suggested depending on the condition such as weight reducing diet for obesity, weight maintenance diet and specific restriction or supplementation for various conditions.

Some cultures and religions have restrictions concerning what foods are acceptable in their diet, e.g. **Halal foods** by Islam and **vegetarians** diet in Buddhists. There is a diet classification table (**Table 4.1**) showing contents of different types of diets.

Diet can also be classified depending on energy density. The energy density of a food or beverage can range from 0 calories per gram to 9 calories per gram and varies based on the proportions of water (0 calories per gram), fiber (2 calories per gram), carbohydrate (4 calories per gram), protein (4 calories per gram), alcohol (7 calories per gram), and fat (9 calories / g).

Malnutrition

Malnutrition is a common problem. **Overnutrition (obesity)** is common in affluent society and **undernutrition** is more prevalent in underdeveloped countries.

Obesity is a burning problem nowadays because of change of food pattern and sedentary lifestyle. It is a major risk factor for many diseases, especially cardiovascular diseases.

OBESITY

Obesity means excess body fat. It develops if energy consumption exceeds energy expenditure, i.e. a person takes excess calorie for long time in the context of less expenditure. This excess calorie is deposited as fat in the body. Common scenario is person enjoying sedentary lifestyle, i.e. mostly table work takes normal or excess food. Currently, obesity is correlated positively with the number of hours spent watching television, and inversely with levels of physical activity (e.g. stair climbing, automobile use).

Obesity is mostly idiopathic or primary where cause is unknown but genetic factor plays an important role in this idiopathic obesity. No single gene is responsible, i.e. obesity is polygenic.

Some endocrine disorders and drugs are responsible for obesity in a few cases which are reversible and given in **Box 5.1**.