



# Nutrition and Health

## Table of contents

1. [Protein: It's Importance](#)
  - i. [Functions](#)
  - ii. [Recommended Dietary Allowance of Proteins](#)
2. [Micronutrients: The Protective Foods](#)
  - i. [Importance of Vitamin A](#)
  - ii. [Vitamin C](#)
  - iii. [Iron](#)
  - iv. [Iodine](#)
3. [Adolescent Growth Spurt](#)
  - i. [Growth, Development & Nutrition](#)
4. [Why do we need energy?](#)
  - i. [Energy-Rich Food](#)
5. [Fat: Human Health](#)
  - i. [Recommended Dietary Allowance](#)
6. [Obesity and Nutrition](#)
  - i. [Causes](#)
  - ii. [How to reduce weight?](#)
7. [Nutrition during Pregnancy](#)
  - i. [Dietary requirements of pregnant women](#)
  - ii. [Do's and don'ts during pregnancy](#)
8. [Related resources](#)

The screenshot shows the homepage of a website dedicated to nutrition and health. The header features the title "Nutrition and Health" in a large, green, serif font, flanked by illustrations of various fruits and vegetables. Below the header is a navigation bar with five main categories: "Introduction", "Know your food", "Nutrient Requirement and their sources", "Food and Diseases", and "Food safety". Each category has a corresponding icon. At the bottom right of the page is a "Site map" link.

Nutrition is a basic human need and a prerequisite for healthy life. A proper diet is essential from very early age of life for growth, development and active life. Nutrition

essential... very early age o... e... g... o... , development and active ...e. Nutri... .

is the science that deals with all the various factors of which food is composed and the way in which proper nourishment is brought about.

The average nutritional requirements of groups of people are fixed and depend on such measurable characteristics such as age, sex, height, weight, degree of activity and rate of growth. In this section following are covered in detail.

## Protein: It's Importance

Proteins are made from amino acids and they are vital for living beings to carry out a wide range of functions essential for life. Almost half of the protein in our body is in the form of muscles. The quality of protein depends upon the content of essential amino acid in the food.

### Functions

- Protein in the form of enzymes and hormones is required for a wide range of vital metabolic processes in the body.
- Proteins supply the body-building material and help body growth and development in children and adolescents.
- In adults, it helps to maintain the losses that occur due to wear and tear.
- During pregnancy and lactation, additional protein is required for synthesis of foetal and maternal tissue.

### Recommended Dietary Allowance of Proteins

- Animal proteins are of higher quality since they provide essential amino acids in right proportion.
- Even vegetarians can get enough protein by eating combination of cereals, millets, nuts and pulses. Milk and egg contain good quality protein.
- Some of the rich sources of protein are pulses, legumes, nuts and oil seeds, milk and milk products, meat, fish and poultry.
- Among the plant foods soybean is the richest source of protein, containing over 40% of protein.
- The amount of protein required for boys (16-18 years) weighing 57 kg weight is 78 gm per day, whereas same age group girls weighing 50 kg need 63 gm/day.
- Pregnant women need 65 gm of protein, while lactating women (up to 6 months) need 75 gm/day.

Foods	Nutrient Content gm/100 g edible portion
-------	--

Soybean	43.2
Bengalgram, black gram, green gram, lentil and red gram	22
Groundnuts, cashew nuts and almond	23
Fish	20
Meat	22
Milk (Cow)	3.2
Buffalo	4.3
Egg (approx. 44 gm)	13.3 (per egg)

## Micronutrients: The Protective Foods

Micronutrients are vitamins and minerals that are required for our body in minute amounts to fight diseases, to support metabolic activities and protect against infections. These are essential for maintenance of health and longevity.

VITAMIN A: Vitamin A is a fat-soluble vitamin. It has important role in vision, immune functions and integrity of skin and mucus membrane. In India, 3% of school age children suffer from vitamin A deficiency signs like bitot spots (a gray patch on the white portion of the eye). One of the earliest manifestations of vitamin A deficiency is night blindness.

## **Importance of vitamin A**

- Vitamin A is essential for normal vision. Its deficiency results in night blindness and other complications.
- Studies suggest that preventing vitamin A deficiency in women during and before pregnancy greatly reduces their risk of mortality and morbidity.
- Dietary intake of vitamin A is advisable to prevent vitamin A deficiency disorders.

## **Vitamin-rich foods**

- Many green leafy vegetables, yellow and orange coloured fruits and vegetables are rich sources of beta-carotene.
- Pro-vitamins like beta carotene are converted to vitamin A. Only foods of animal origin contain performed vitamin A.
- Milk and milk products, egg yolk, red palm oil, fish and fish liver oil are also rich in vitamin A. Total beta-carotene content of some foodstuffs.

<b>Name of the food stuff</b>	<b>Beta carotene <math>\mu</math>/100 edible portion</b>
Coriander leaves	4800
Curry leaves	7110
Drumstick leaves	19690
Fenugreek leaves	9100
Carrot	6460
Mango ripe	1990
Papaya ripe	880
Pumpkin	1160

## **Vitamin C**

Vitamin C is an essential micronutrient and an antioxidant. It gives protection against infections. Vitamin C deficiency causes scurvy characterised by weakness, bleeding gums and defective bone growth. Vitamin C helps in wound healing, amino acid and carbohydrate metabolism and synthesis of some hormones. It also influences iron absorption.

### **Vitamin C rich foods**

- It is present in all fresh citrus fruits such as orange, lemon and amla.
- Commonly consumed fruits such as tomato and guava are good sources of vitamin C.
- Sprouted grams are also rich sources of vitamin C

## **Iron**

Iron is an essential element for the formation of hemoglobin in red blood cells and plays an important role in transport of oxygen. In our country, anemia is a major public health problem in young children, adolescent girls and pregnant women. Approximately 50% of the populations suffer from nutritional anemia. Nutritional anemia adversely affects work output among adults and learning ability in children.

### **Eat iron-rich foods**

- Plant foods like green leafy vegetables, dried fruits and legumes contain iron and millets such as bajra and ragi are good sources of iron. Remember that only 3-5% of iron from plant sources is absorbed by the body.
- Iron is also obtained through meat, fish and poultry products..
- Fruits with vitamin C like amla, guava and citrus improve iron absorption from plant foods.
- Avoid tea/coffee after a meal.

## **Iodine**

- Iodine is essential for the synthesis of thyroid hormones (thyroxin) which in turn is responsible for normal physical and mental growth.
- The daily requirement of iodine is 100-150 µg/day and it varies with age and certain physiological conditions.
- Iodine deficiency disorders (IDD) are important micronutrient deficiency disorders of public health importance in India.
- Iodine deficiency in pregnancy affects the foetal growth and its mental development.
- Iodine deficiency leads to hypothyroidism, goiter and growth retardation.
- We get iodine from the food we eat especially sea foods and water
- Substances called goitrogens that are present in vegetables like cabbage, cauliflower,

tapioca etc. interfere with metabolic utilization of iodine.

- One should use iodized salt daily in the diet to prevent IDD.

## Adolescent Growth Spurt

Adolescents constitute more than one-fifth of India's population. The word adolescent comes from the Latin word 'Adolescence' meaning to grow, to mature signifying the special features of adolescence.

### Growth, Development & Nutrition

Adequate nutrition is critical for growth spurt during adolescence. Poor nutrition is often cited as one of the reasons for delay in the onset of puberty, especially among Indian adolescent girls. Growth spurt that signals the onset of puberty depends on the girl's attaining a critical weight of 30 kg and a critical body composition of 10% body fat.

There is an increased demand for energy, protein, minerals and vitamins during adolescence.

Age group	Energy kcal/day	Protein g/day	Fat g/day	Calcium mg/day	Iron mg/day	Vitamin A µg/day (Beta caroten)
-----------	-----------------	---------------	-----------	----------------	-------------	---------------------------------

10-12 yrs Boys	2190	54	22	600	34	2400
10-12 yrs Girls	1970	57	22	600	19	2400

13-15 yrs Boys	2450	70	22	600	41	2400
13-15 yrs Girls	2060	65	22	600	28	2400

16-18 yrs						
Boys	2640	78	22	500	50	2400
16-18 yrs	2060	63	22	500	30	2400
Girls						

**Source:** Recommended Dietary Allowances for Indians, NIN, ICMR, Year: 1989.

## Why do we need energy?

Human beings need adequate energy to carry out their daily routine physical work, maintain body temperature, metabolic activity and to support growth. The survey conducted by National Nutrition Monitoring Bureau (NNMB) revealed that in India nearly 50% of men and women suffer from chronic energy deficiency.

- Energy requirement of an individual is based on daily energy expenditure. It is also dependent on age, body weight, level of physical activity, growth and physical status. In India, 70-80% of the total dietary calories are obtained from food grains such as cereals, millets, pulses and tubers.
- Children including adolescents obtain 55-60% of their daily requirement of calories from carbohydrates.
- Adolescents require more energy for healthy growth. For example, girls and boys in the age group of 16-18 require 2060 kcal and 2640 kcal, respectively.
- During pregnancy, additional energy is needed to support the growth of foetus and the health of pregnant women.
- Energy inadequacy leads to under-nutrition and at the same time excess intake results in obesity.

## Energy-Rich Food

- Include cereals, millets, pulses, tubers, vegetable oils, ghee, butter, oil seeds, nuts, sugar, jaggery, etc.
- Since we get most of our calories from cereals, consumption of different varieties of cereals and millets should be encouraged.
- Coarse cereals like jowar and bajra, and millets like ragi are inexpensive and good sources of energy

Food items

Energy (kcal/100 gm edible portion)

Rice	345
Wheat flour	341
Jowar	349
Bajra	361
Ragi	328
Maize	342

## Fat: Human Health

Fat is an important component of diet and serves a number of functions in our body. It is a concentrated source of energy providing 9 kcal per gram. Minimum fat is essential to absorb the fat-soluble vitamins such as vitamin A, D, E and K, available in the diet.

- Dietary fats are derived from both plant and animal sources.
- Vegetable oils are major dietary sources of essential fatty acids (EFA) and other unsaturated fatty acids called MUFAs (monounsaturated fatty acids) and PUFA (polyunsaturated fatty acids).
- Dietary fats provide essential fatty acids, which are functional components of membrane lipids and have other important metabolic functions.
- Adults need to restrict intake of saturated fat (ghee, butter and hydrogenated fat).
- Vegetable oils except coconut oil are rich in unsaturated fatty acids.
- Excess intake of saturated fat items like butter, ghee, and hydrogenated fat could lead to high blood cholesterol which is not good for health and also it may lead to obesity and cardiovascular disease.
- Fats that are used for cooking (vegetable oils, vanaspati, butter and ghee) are termed as visible fats. Fats that are present in the food item are called invisible fat.
- Animal foods provide high amount of saturated fat.

## Recommended Dietary Allowance

- Diet for young children and adolescent contains above 25 gm visible fat.
- Adults with sedentary habits require 20 gm per day.
- Pregnant and lactating women need 30 gm per day of visible fat to meet their physiological needs.

Linoleic (LIN) linoleinic (LEN) acid content of edible oils (g/100 g)

Oil	LIN	LEN	Total EFA

Ghee	1.6	0.5	2.1
Coconut	2.2	-	2.2
Vanaspati	3.4	-	3.4
Palmolein	12.0	0.3	12.3
Rape/mustard	13.0	9.0	22.0
Groundnut	28.0	0.3	28.3
Rice bran	33.0	1.6	34.6
Sesame	40.0	0.5	40.5
Sunflower oil	52.0	Trace	52.0
Soybean	52.0	5.0	57.0
Safflower	74.0	0.5	74.5

## Obesity and Nutrition

Obesity is a state in which there is a generalized accumulation of excess fat in adipose tissue in the body leading to more than 20% of desirable weight. Obesity has several adverse health effects and can even lead to premature death. Obesity leads to high blood cholesterol, high blood pressure, heart disease, diabetes, gall bladder stone and certain types of cancer.

## **Causes**

- Over-eating and reduced physical activity together lead to obesity.
- Obesity and over-weight are caused by a chronic imbalance between energy intake and energy expenditure.
- High intake of dietary fat also causes obesity.
- Complex behavior and psychological factors also cause over-eating and thus lead to obesity.

Metabolic errors in energy utilization may favour fat accumulation. Obesity in childhood and adolescence can lead to adult obesity. Among women, obesity develops just around pregnancy and after menopause.

## **How to reduce weight?**

- Eat less fried foods.
- Eat more fruits and vegetables.
- Eat more fiber-rich food items like whole grains, grams and sprouts.
- Do regular exercise to keep the body weight within normal limits.
- Slow and steady reduction in body weight is advised.
- Severe fasting may lead to health hazards. Enjoy a variety of foods needed to balance your physical activity.
- Eat small meals regularly at frequent intervals.
- Cut down sugar, fatty foods and alcohol.
- Use low-fat milk.
- Weight reducing diet must be rich in protein and low in carbohydrates and fat.

## **Nutrition during Pregnancy**

Demand for nutritious diet is high during pregnancy. Extra food is required to meet the needs of the foetus and the pregnant women. In India, it is observed that diets of women belonging to the poorer groups are similar to non-pregnant and non-lactating women even during pregnancy and lactation.

- Maternal malnutrition leads to high prevalence of low birth weight infants and high maternal and infant mortality.
- Additional foods are required to improve the birth weight and to increase mother's body fat deposits.
- Lactating women need more nutritious food for optimum milk output.

## **Dietary requirements of pregnant women**

- Diet of a pregnant woman has a direct influence on the weight of the baby at birth.
- Diet during pregnancy should contain larger amounts of protective foods.
- Pregnant women need an additional 300 kcal of energy, extra 15 gm of protein and 10 gm fat from mid pregnancy onwards.
- During pregnancy and lactation additional amount of calcium is required for proper formation of bone and teeth and also for secretion of breast milk.
- Iron deficiency anemia during pregnancy increases maternal mortality and the incidence of low birth weight. Hence, consuming iron-rich food is essential.

## Do's and don'ts during pregnancy

- Eat more food during pregnancy and lactation.
- An additional meal is preferable.
- Eat more whole grain, sprouted grams and fermented food.
- Take milk/meat/egg.
- Eat plenty of vegetables and fruits.
- Do not use alcohol and tobacco.
- Take medicine only when prescribed.
- Take iron, folate and calcium supplements regularly after 14-16 weeks of pregnancy and continue the same during lactation.
- Beverages like tea and coffee bind dietary iron and make it unavailable; hence they should be restricted before and soon after a meal.
- Pregnant women need walking and other physical activity and should avoid heavy physical work, particularly during the last month of pregnancy.

**Source:** [National Institute of Nutrition, Hyderabad](#) ↗

## Related resources

- [Nutrition and Health](#) ↗

---

**Source** <https://data.vikaspedia.in/short/lc?k=F4BhH-DRAebZd-T0Sp9I6g>

