



# **SNS COLLEGE OF TECHNOLOGY**

**AN AUTONOMOUS INSTITUTION**

**Approved by AICTE New Delhi & Affiliated to Anna University Chennai  
Accredited by NBA & Accredited by NAAC with “A++” Grade, Recognized by UGC**

**COIMBATORE**

## **DEPARTMENT OF CIVIL ENGINEERING**

**19GET277 – BIOLOGY OF ENGINEERS**

**IV YEAR / VII SEMESTER**

**UNIT 1- INTRODUCTION TO LIFE**



# VITAMINS



# Definition

- Vitamins are organic compounds, found in natural foods which are required for normal growth and maintenance of the body. Both humans and animals require vitamins for their growth.
- The word vitamin is a combination of Latin words “vita” and “amine” which means life and nitrogen respectively. Casimir Funk discovered a substance that helps in the growth and maintenance of the body and named it in 1884.
- Vitamins act as a catalyst in the generation of energy by utilizing carbohydrates and fats properly. Humans cannot live without vitamins and the human body cannot produce it on its own (except vitamin D and Vitamin B3). So it should be taken in required quantities through other sources such as the food we take, vitamin capsules etc. Vitamins can be found in major foods like meat, leafy vegetables, fruits etc.
- Vitamin deficiency may cause some diseases and overdose also causes diseases.



# Types of Vitamins

Vitamins are of two types:

- Fat-soluble – which are dissolved in fat
- Water-soluble – which are dissolved in water



# Functions of Vitamins

- Based on their role in biological processes and their effect different vitamins have different functions, their function can be best understood by knowing about their deficiency diseases. Given below is the list of vitamins and their deficiency diseases:
- **Vitamin A** – Hardening of the cornea in the eye, night blindness.
- **Vitamin B1** – Deficiency may cause beriberi and dwarfism.
- **Vitamin B2** – Deficiency can cause disorders in the digestive system, skin burning sensations, and cheilosis.
- **Vitamin B6** – Deficiency of B6 causes convulsions, conjunctivitis, and sometimes neurological disorders.
- **Vitamin B12** – Its deficiency can cause pernicious anaemia and a decrease in red blood cells in haemoglobin.



- **Vitamin C** – It is a water-soluble vitamin, its deficiency causes bleeding in gums and scurvy.
- **Vitamin D** – It is obtained by our body when exposed to sunlight. Its deficiency causes improper growth of bones, soft bones in kids, and rickets.
- **Vitamin E** – Deficiency of vitamin E leads to weakness in muscles and increases the fragility of red blood cells.
- **Vitamin K** – It plays an important role in blood clotting. The deficiency of vitamin K increases the time taken by the blood to clot. Severe deficiency may cause death due to excessive blood loss in case of a cut or an injury.

Although these compounds are required in very small quantities by our body to perform several biological functions, and their deficiency may lead to severe diseases



## Diseases due to deficiency of Vitamins

Name	Solubility	Food Sources	Deficiency Diseases
Vitamin A	Fat	Green leafy vegetables, ripe yellow fruits, guava, milk, liver, nuts, tomatoes, oranges, carrots, broccoli, watermelon etc.	Hyperkeratosis, night blindness, and keratomalacia
Vitamin B1 (Thiamine)	Water	Fresh fruits, potatoes, sweet potatoes, peas, corn, cashew nuts, wheat, milk, black beans, dates etc.	Beriberi
Vitamin B2 (Riboflavin)	Water	Banana, dates, mushrooms, grapes, mangoes, peas, pumpkin, popcorn etc.	Slow growth, sore eyes
Vitamin B3 (Niacin)	Water	Meat, fish, eggs, milk products, cereals, mushroom, guava etc.	Pellagra
Vitamin C	Water	Fresh fruits, black currant, broccoli, goat milk and chestnuts.	Scurvy
Vitamin D	Fat	Fish, egg, liver, beef, cod, chicken breast etc.	Rickets and Osteomalacia
Vitamin E	Fat	Potatoes, pumpkin, guava, mango, milk, nuts, seeds etc.	Heart problems, Haemolysis and sterility
Vitamin K	Fat	Tomatoes, broccoli, chestnuts, cashew nuts, beef, lamb, mangoes, grapes etc.	Haemorrhage