

Module 1

Introduction to the basics of nutrition

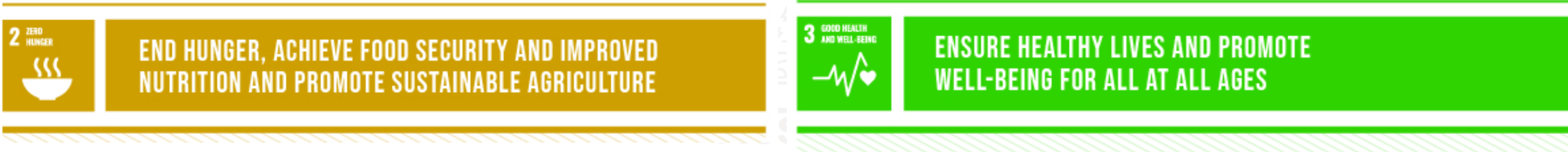
Module coverage



Topic	Sub-topics covered	Learning objectives
Introduction to nutrition	• Concepts of basic nutrition. • Classification of nutrients. • Dietary guidelines for Indians 2024 - Food group approach to balanced diet.	✓ Understand the basics of nutrition. ✓ Key nutrients, food groups and their role in diet.

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. ^[1]

Of the 17 Sustainable Development Goals set by the UN, SDG 2 (Zero Hunger) and SDG 3 (Good health and well-being) are directly relevant to public health outcomes. ^[2]



Good health has the following imperatives:

Achieve optimal growth and development, reflecting the full expression of one's genetic potential.

Maintain the structural integrity of organs and functional efficiency.

Withstand the inevitable process of ageing with minimal disability and functional impairment.

Combat disease and infections by preventing the onset and progress of disease.

UN Decade of Action on Nutrition from 2016 to 2025

The purpose of nutrition is enabling good health.

Nutrition is the sum of all processes involved in how organisms obtain nutrients, metabolise them, and use them to support all of life's processes.^[4]

Nutrition is a fundamental pillar of human life, health and development across the entire life span.^[5]

Nutrition is a basic human need and a prerequisite to a healthy life.^[6]

- Nutrition is obtained through the food and beverages we consume.
- There may be indirect sources too, like metabolites produced by gut microbes (SCFA, BCAA, others) or the role of UVB in converting 7-dehydrocholesterol into pre-vitamin D3.

Malnutrition

A balanced intake of nutrition is necessary for optimum health.^[7]

Undernutrition is a type of malnutrition where the body does not receive enough calories or essential nutrients caused by poor diets, illness and digestive disorders.

Overnutrition is a type of malnutrition that occurs when you consume more nutrients than your body needs. It can lead to weight gain, high blood pressure and other non-communicable disease conditions, but also includes a higher susceptibility to infectious diseases.^[7]

Largely food intake dependent

Examples: Wasting, Stunting, Underweight.

Micronutrient dependent

Examples: Goitre (Iodine), Anaemia (Iron), Rickets (Vitamin D).

Largely calorie dependent

Examples: Obesity, NIDDM, CVDs.

Sometimes micronutrient dependent

Examples: Hypervitaminosis.

Estimated Average Requirement (EARs) and Recommended Dietary Allowance (RDAs) of nutrients allow for the guidance of balanced diets.

Some important metrics indicating Dietary Reference Intakes.^[8]

1. **Estimated Average Requirement (EAR)**
 2. **Recommended Dietary Allowance (RDA)**
 3. **Tolerable Upper Level (TUL)**
 4. **Adequate Intake (AI)**
 5. **Lower threshold intake (LTI)**
- Nutrient requirement is not the same for all individuals.
 - Two distinct nutrient requirements - EAR and RDA are used in defining nutrient requirements of normal individuals.
 - The TUL is the highest daily nutrient intake that is likely to pose no risk of adverse health. The TUL of intake of nutrients is especially relevant to fortified foods and the nutrients being used.

EAR of nutrients for Indians

EARs are derived for 12 categories of the population, across 15 nutrients and energy.^[9]

- Adult men >18y
- Adult women >18y
- Pregnant
- Lactation (0-6m, 6-12m)
- Infants (0-6m, 6-12m)
- Children (1-3y, 4-6y, 7-9y)
- Boys 10-12y
- Girls 10-12y
- Boys 13-15y
- Girls 13-15y
- Boys 16-18y
- Girls 16-18y

Physical activity

Sedentary
Moderate
Heavy

Body weight (kg)

Energy
Protein
Dietary fiber

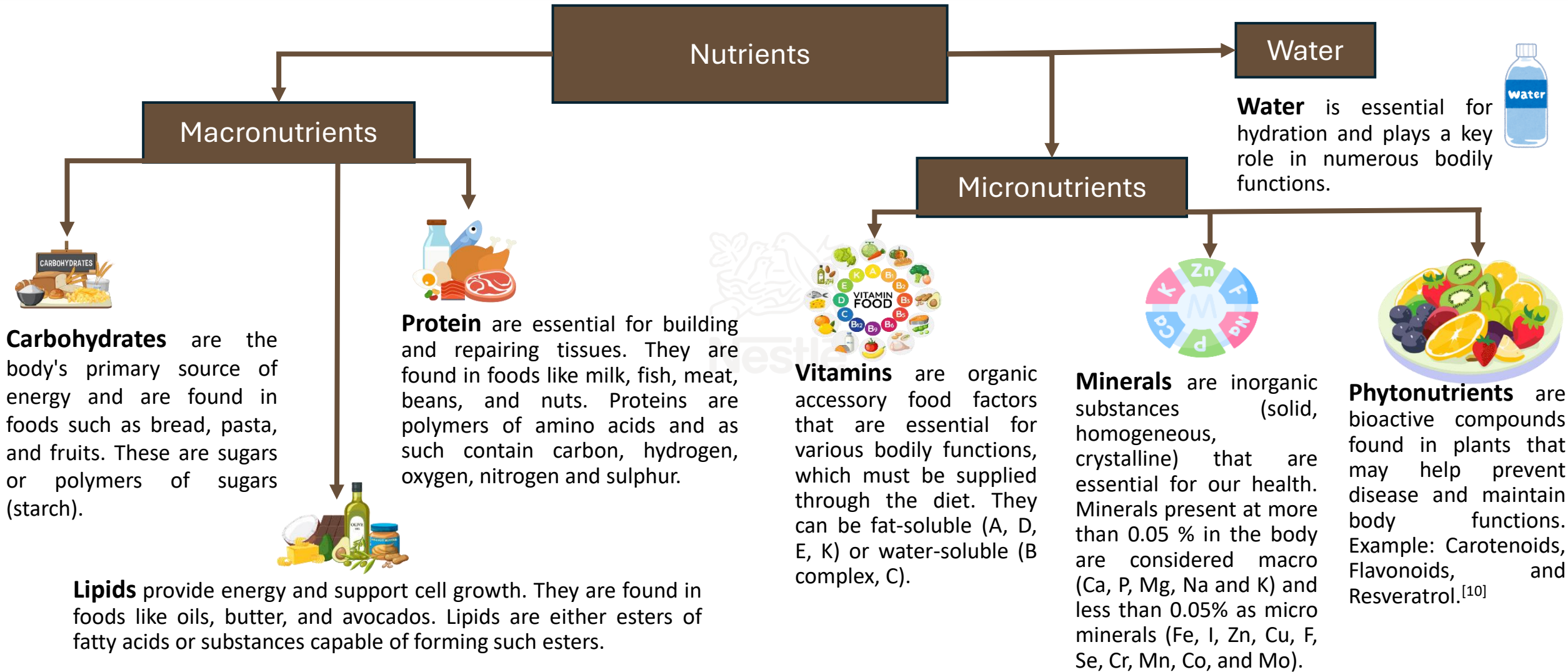
Vitamins

Vitamin A
Vitamin B1
Vitamin B2
Vitamin B3
Vitamin B6
Vitamin B9
Vitamin B7
Vitamin B9
Vitamin B12
Vitamin C
Vitamin D

Minerals

Calcium
Iron
Zinc
Iodine

Types of nutrients



Dietary guidelines for Indians 2024



17 guidelines which are easy to understand and follow.^[11]

- Eating a variety of foods to ensure a balanced diet.
- Ensuring provision of extra food and healthcare during pregnancy and lactation.
- Ensuring exclusive breastfeeding for the first six months and continuing breastfeeding till two years and beyond.
- Feeding homemade semi-solid complementary foods to the infant soon after six months of age.
- Ensuring an adequate and appropriate diet for children and adolescents in health and sickness.
- Eating plenty of vegetables and legumes.
- Use oils/fats in moderation; choose a variety of oil seeds, nuts, Nutri cereals, and legumes to meet your daily needs of fats and essential fatty acids (EFA).
- Obtaining good quality proteins and essential amino acids (EAA) through an appropriate combination of foods and avoiding protein supplements to build muscle mass.
- Adopting a healthy lifestyle to prevent abdominal obesity, overweight and overall obesity.
- Being physically active and exercising regularly to maintain good health.
- Restricting salt intake.
- Consuming safe and clean foods.
- Adopting appropriate pre-cooking and cooking methods.
- Drinking an adequate quantity of water.
- Minimizing your consumption of high-fat, sugar, and salt (HFSS) and ultra-processed foods (UPFs).
- Including nutrient-rich foods in the diets of older people for health and wellness. Eat a variety of foods to ensure a balanced diet.
- Reading the information on food labels to make informed and healthy food choices.

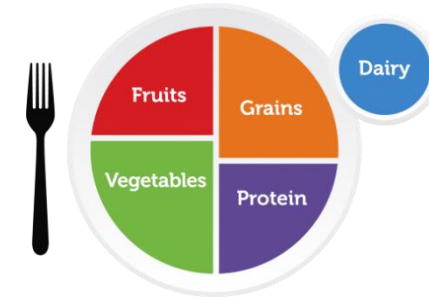
My plate for the day

Across countries, “My Plate” concepts are being formulated based on dietary guidelines and population requirements.



The National Institute of Nutrition (NIN) released the “My plate for the day^[11]” representing proportions of different food groups for meeting ~2000 kcal.

Consumption of proportions of food groups indicated in the plate helps prevent macronutrient & micronutrient malnutrition (hidden hunger).



The U.S. Department of Agriculture (USDA) created the “MyPlate^[12]” concept, an easy-to-follow food guide, to help parents figure out how to feed their kids nutritious, balanced meals. The colourful divided plate includes sections for vegetables, fruits, grains, and protein foods.

**Nutritional well-being depends upon four main factors:
food, care, health, and environment.^[5]**

NUTRITIONAL WELL – BEING FOR ALL

Food and Nutrient Security

Access by all people of all ages, in all seasons, to the food, diet and nutrients they need for a healthy life.

Care for the vulnerable

Includes the time, attention, and behaviour needed (in addition to household food security requirements) to ensure healthy nutrition.

Health for all

Good health is as essential to nutritional wellbeing as good nutrition is crucial for maintaining healthy growth and development.

Safe Environment

Physical and biological environments have a major impact on health, and sustainable policies are required.

Holistic understanding of nutrition including the science, cultural and economic impacts are important in nation building.

Nutrition research institutions in India:

- NIN: National Institute of Nutrition, which focuses specifically on nutrition research.
- CFTRI: Central Food Technological Research Institute, focuses on food technology research.
- ICMR: Indian Council of Medical Research, the apex body in India for the formulation, coordination and promotion of biomedical research.
- ICAR: Indian Council of Agricultural Research, focuses on agricultural research, including research on crops and livestock that are important for food production.

Suggested read:

- https://www.nin.res.in/RDA_short_Report_2024.html
- www.who.int
- <https://www.icmr.gov.in/>
- <https://www.nin.res.in/bookrecommendations.html>