

NIOS lesson adaptation project

by  **Embrace** Volunteers
The power within you!

(A community initiative of Harchan Foundation Trust)

Lesson- 2

FOOD AND ITS NUTRIENTS

This project is aimed at supporting children with different needs. Information provided is adapted to the best of knowledge by the volunteers. For complete information please refer to the NIOS resources in <https://www.nios.ac.in/online-course-material/secondary-courses.aspx>.

K - What does the child KNOW	W - What does the child WANT to know	L - What has the child LEARNT
	Food and its importance for healthy living	
	Nutrition and Nutrients	
	Functions and sources of Nutrients.	
	Deficiency diseases.	

Keywords and meanings

KEYWORD	
Deficiency	A lack or shortage
Malnutrition	Does not have right balance of nutrients for good health
Cretinism	Condition of severely stunted physical and mental growth
Food fortification	The process of adding micro nutrients to food.
Constipation	Refers to bowel movements that hard to pass
Satiety	Being satisfied especially when referring to eating.

Functions of food

- Food gives us energy
- Food helps in the growth and repair of tissues.
- Food gives strength to fight against diseases.
- Food helps the body to function normally.
- Food satisfies hunger.
- Social functions.
- Psychological functions.

Nutrition & Nutrients

Nutrition

Science about what happens to food when it enters our body

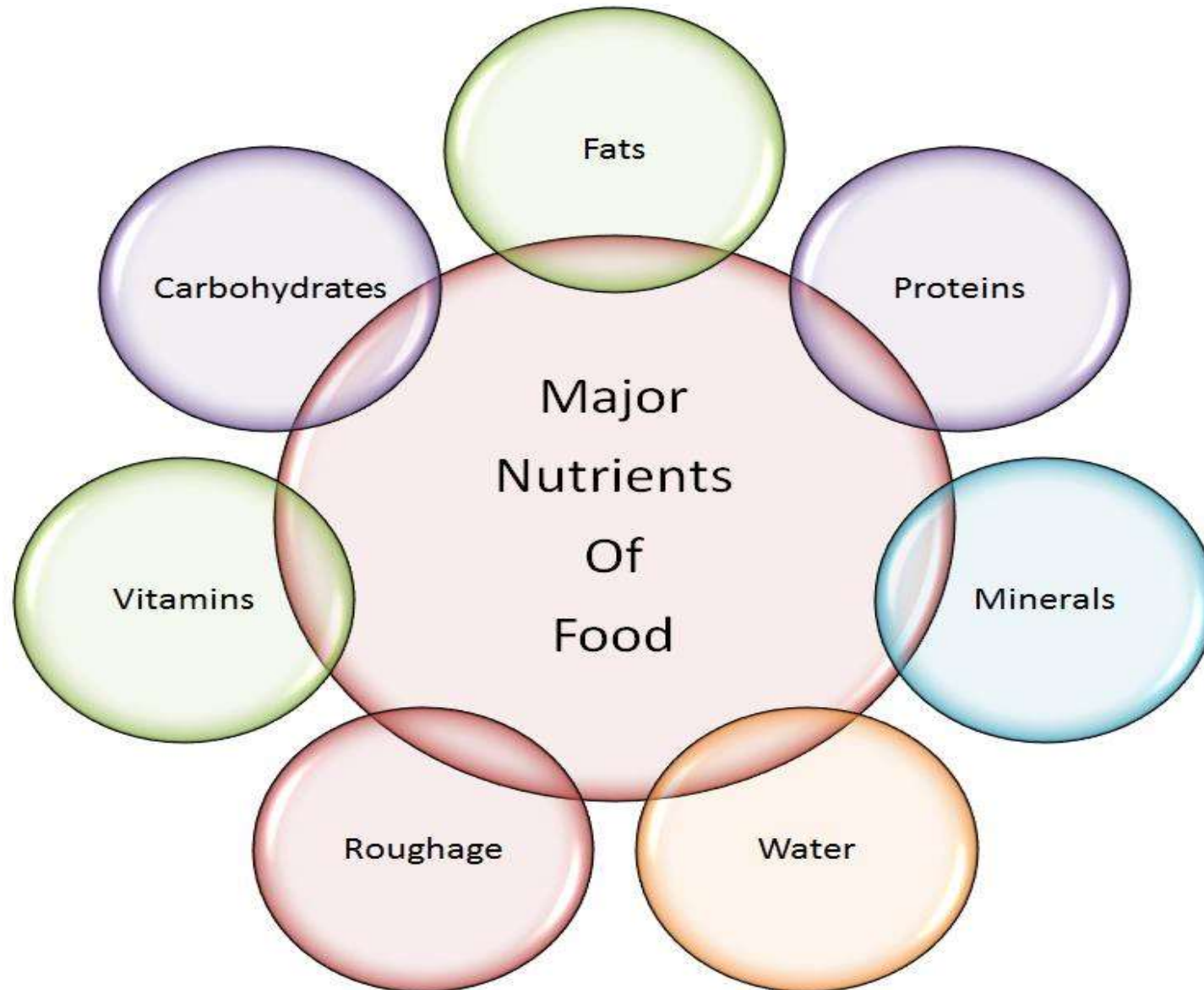
Nutrients

Invisible components in the food necessary for keeping the body healthy





Common Nutrients

1. Carbohydrates
2. Proteins
3. Fats
4. Vitamins
5. Minerals
6. Fibre
7. Water

Major nutrients of food



Function and source of nutrients

Name of the Nutrient	Sources	Function	
Carbohydrates (energy giving food)	Rice, potato, wheat, sugar	Provides energy	
Fats (energy giving food)	Butter, ghee, milk, cheese	Gives more energy compared to carbohydrates	
Vitamins and minerals (protective food)	Fruits and vegetables	Required for normal growth and development	
Proteins (body building food)	Milk, eggs, meat, fish, soybean	Helps in building and repair of body	

Nutrients in food

1. Carbohydrates : Gives energy to our body

Sugar

Sugar is called simple carbohydrate



Fruits



Honey



Sugar

Starch

Starch is called complex carbohydrate



Cereals



Potatoes and sweet potatoes

1 gm of carbohydrate gives 4 Kcal
Adult requirement 400-420 gm /day

2. Proteins :

Helps in muscle building and repairing worn out cells and tissues

Animal protein

Protein from animal source



Plant protein

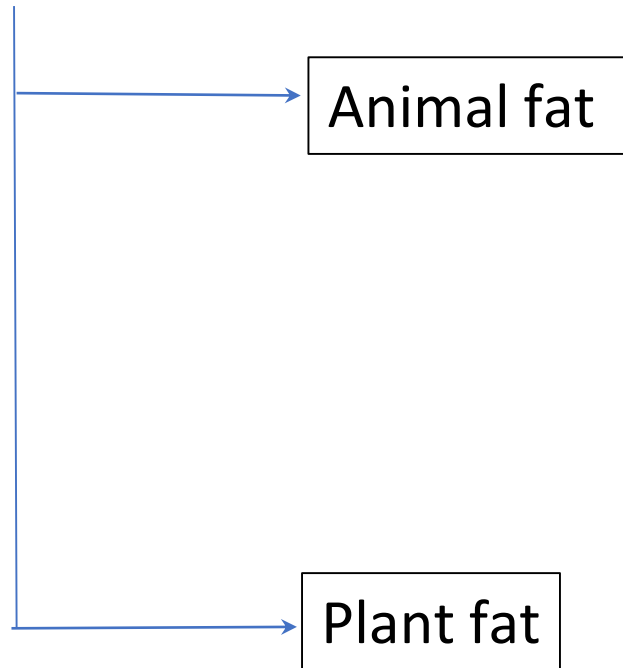
Protein from plant source



1gm of protein gives 4 kcal

Adult requirement-1 gm of protein for every kg of body weight/day

3.Fats : They help to provide concentrated source of energy and protect body from cold weather



Fat from animal source

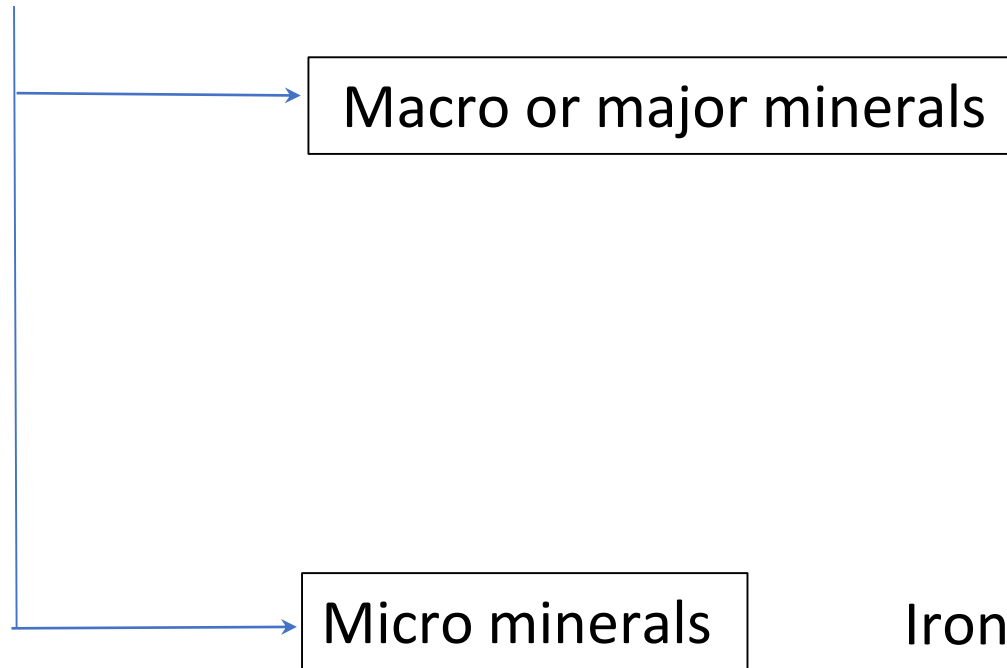


Fat from plant source



1 gm of fat gives 9 kcal
Adult requirement 30 gm/day

4. Minerals : They are present in all body tissues and fluids



Calcium and phosphorus found in large quantities



Iron and Iodine found in small quantities



Minerals - Source and function

Minerals	Functions	Sources
Calcium	<ul style="list-style-type: none">▪ Helps bones to grow strong.▪ Makes teeth healthy and strong.▪ Helps in clotting blood.▪ Helps in the movement of muscles.	Milk and its products like: cheese, paneer, curd, lassi, butter milk. Green leafy vegetables.
Iodine	<ul style="list-style-type: none">▪ Needed for proper functioning of thyroid gland in our body	Sea foods like fish and sea weeds. Plants which grow in iodine rich soil. Iodized salt.
Iron	<ul style="list-style-type: none">▪ Needed for the formation of hemoglobin in our blood- helps in carrying oxygen.	Green leafy vegetables, cereals and legumes. Liver, heart, kidney and egg yolk. Jaggery, dates and pomogronate.

5. Vitamins: Present in small quantity but essentials for proper functioning of body

Water soluble vitamins

Which are soluble in water



Fat soluble vitamins

Which are soluble in fat



Vitamins

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graph TD; A[Vitamins] --> B[Water Soluble]; A --> C[Fat Soluble]; B --> D[Vitamin B group]; B --> E[Vitamin C]; C --> F[Vitamin A]; C --> G[Vitamin D]; C --> H[Vitamin E]; C --> I[Vitamin K];
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The diagram is a hierarchical flowchart. At the top is a green-bordered box containing the word 'Vitamins' in red. Two red arrows point downwards from this box to two separate brown-bordered ovals. The left oval is labeled 'Water Soluble' in purple. Below it, a vertical grey line has two horizontal branches, each leading to a blue-bordered box containing 'Vitamin B group' and 'Vitamin C' respectively. The right oval is labeled 'Fat Soluble' in purple. Below it, a vertical red line has four horizontal branches, each leading to a blue-bordered box containing 'Vitamin A', 'Vitamin D', 'Vitamin E', and 'Vitamin K' respectively.

Water Soluble

Vitamin B group

Vitamin C

Fat Soluble

Vitamin A

Vitamin D

Vitamin E

Vitamin K

Fat Soluble Vitamins & Sources

A

Fat Soluble



Vision,
Reproduction,
Bone Health,
Immune System,
Skin

D

Fat Soluble



Strengthens Bones,
Calcium Absorption,
Immune System

E

Fat Soluble



Immune System,
Flushes Toxins

K

Fat Soluble



Blood Clotting,
Bone Health

Water soluble Vitamins-Source and function

Water soluble vitamins	Functions	Sources
B Complex	<ul style="list-style-type: none">➤ Helps the body use energy.➤ Keeps the digestive system healthy.	Pulses, whole grains, cereals, wheat, rice etc.
Vitamin C	<ul style="list-style-type: none">➤ It helps the cells to hold cells together.➤ Keeps our teeth and gums healthy.	Fruits, leafy vegetables, sprouted grains, guava and amla.

6. Dietary Fibre

Roughage : Indigestible carbohydrate present in food
Ex: Dalia, banana, rajmah, peas and carrot

Functions :

- ✓ Helps in softening the stool and makes easy to pass
- ✓ It gives high degree of satiety.

Helps in prevention of

- Constipation.
- Cancer of large intestine
- Diabetes.
- Obesity



7. Water

- Body can't function without water
- Helps in detoxification
- Lubrication
- Every cell need water
- Helps in transport & absorption of nutrients
- Daily requirement of water is 2 – 2.5 Liters (8 Glasses)



Deficiency Diseases

Deficiency Diseases are caused due to the absence of certain nutrients in daily diet

Nutrient	Deficiency disease
Vitamin A	Night blindness
Vitamin D	Rickets
Vitamin K	Avitaminosis
Vitamin C	Scurvy



Protein Energy Malnutrition

PEM is caused due to the deficiency of protein, carbohydrates and fats. It affects children in the age group of 1 to 5 years.

PEM is of two types

- 1) **Kwashiorkar**: Protein intake is deficient but calories or energy is sufficient.
- 2) **Marasmus**: Protein and energy both are insufficient.

Symptoms of kwashiorkor



1. Large pot-like belly.

2. Stunted growth.

3. Swelling of face and limbs

4. Skin diseases.

5. Mental retardation.



Marasmus

- *Nutrient* : Protein
- *Food source*: Fish, meat, egg(albumin), milk, peas, cereals
- *Deficiency disease* : **Marasmus**
- *Symptoms*: Thin limbs, weak appearance, enlarged head, loss of weight, retarded physical and mental growth.



Vitamin A deficiency: (Night blindness)

Found mainly in children and pregnant women.

Lack of this vitamin results

- stunted growth
- dryness of black part of the eye.



The problem of **night blindness** sets, the child cannot see in dim light.

Iron deficiency anemia

Causes:

- Inadequate intake of iron.
- Hook worm infestation.
- Excessive blood loss due to accidental injury.

Incidence

- Usually found in women and children.

Symptoms

- Due to reduced supply of oxygen we feel tired, restless and fatigued

Vitamin B complex deficiency

Causes

- ✓ Low intake of vitamin B rich food in our diet.

Symptoms

- ✓ sore mouth
- ✓ sore tongue
- ✓ redness of the tongue
- ✓ cuts at the angles of mouth.

Prevention

- ✓ consumption of brown rice instead of white rice



CHEILOSIS, ANGULAR STOMATITIS AND
MAGENTA TONGUE IN ARIBOFLAVINOSIS

Vitamin C deficiency:

Vitamin C deficiency is called as **scurvy**

Symptoms

- Gums, bones and teeth become weak.
- Gums swell up and start bleeding.
- Wounds will not heal up quickly.

Solution

- include fresh fruits and vegetables in our diet .



Iodine Deficiency Disorder(IDD)

Iodine deficiency leads to a number of disorders like:

Goitre

- Deficiency of iodine leads to Goitre
- more females are affected than male

Cretinism

- Severe iodine deficiency during prenatal life leads to cretinism
- cretinism leads mental retardation

Solution

- Eat iodized salt
- Store iodized salt in air tight containers to prevent loss of iodine



Need of eating variety of food

- ❖ Different nutrients are required by body to stay healthy.
- ❖ There is no single food which gives all nutrients
- ❖ Knowledge of nutrition helps us to know about quantity intake of Individual need to maintain good health without any deficiency disease.

List of Volunteers

Embrace-NIOS lesson adaptation project

(A community initiative of Harchan Foundation Trust)

Mentors (Volunteers) : Banu Arjun, Hema Bhatia, Indumathi , Kalpana Sankar, Priya Balasubramanian, Renu Goyal, Sowmya Srikumar, Viraja.

Special educator/Parent Volunteers:

Beverly Sujit ,Chantelle Saldana, Gayathri,Haritha Meda,Jaishree Muralidharan, Madhushree Bhat, Meenakshi, Nisha Narayanan, Pavithra, S. Arjun , Savita Sharma Bhardwaj, Sathyabhama Naryanan, Selvarani, Shakkeela Narikkoottungal, Shweta Taneja, Sucharitha Karthik, Suja Varghese, Sunitha R , Rohitesh Sharma , Tinu Anna Sam.

"volunteers don't necessarily have the time, they just have the **HEART**."

~ elizabeth andrew

Thank You
Volunteers.

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