

LIFE AND LIVING

NUTRITION

- All living things require **nutrients** to **sustain** their bodies.
- Green plants can produce their own food but animals must obtain their own food from other sources.
- Animals eat plants or meat of other animals.
- Nutrition can **be defined as the processes by which living organism take in food and use it for energy, growth and repair.**

WHY WE REQUIRE NUTRIENTS?

- We need food to live. Without food our cells will stop functioning and we will die. We require nutrients for:

Growth

- Nutrients supply the building blocks for the production of cells and tissues.

Energy

- Food is the source of **fuel**.

Health

- Our cells require a variety of nutrients to remain healthy. If we do not eat certain nutrients we can become ill due to lack of these nutrients.

Repair and replacement of worn and damaged cells

- Nutrients are required to replace dead cells (for example cells in the skin that are worn) and for the healing of wounds.

Basic nutrient requirements

- The small particles that are digested and are used up by cells are called **nutrients**. Nutrients are chemical compounds that feed the body. Humans require the following nutrients to stay alive:

Nutrient	Function	Source
Proteins	The building block for growth and repair	Meat, fish, butter, eggs, beans, dairy products.
Carbohydrates	The source of instant energy	Sugar and starch, food such as potatoes, rice, maize, meal, bread, pasta, cereals, and certain fruits and vegetables
Fats	The reserve source of energy and the body's insulation against the cold	Oils, nuts, butter, certain meat and dairy products
Vitamins	Ensure normal growth and development. Keeps your body healthy, important for healthy skin, bones and gums, helps fight infection	Mostly in fresh fruit and vegetables, also in dairy products, whole wheat, meat, fish and eggs
Minerals	Ensures normal growth and development. Iron is good for the blood; calcium build strong bones and teeth; magnesium is good for your nerves.	Fresh fruit, vegetables, dairy products, meat and eggs
Water	Is the main ingredient of the living body and supplies a fluid medium in which metabolic processes can take place	Drinking water, fruit, drinks and food
Fibre	Prevents constipation and certain types of cancers	Cereals, fruit and vegetables

DIGESTION

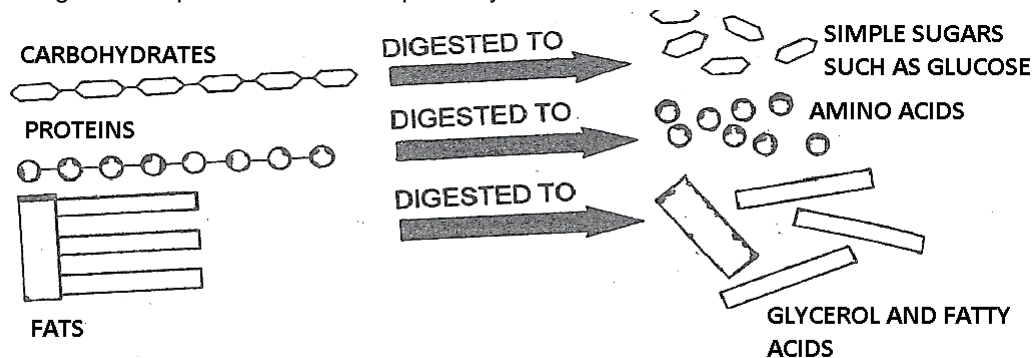
- **Digestion** is the breaking down of organic food compounds (proteins, fats and carbohydrates) to their simplest forms to be used by the cells. It is the process that changes **insoluble** food substances to **soluble substances**.

WHY FOOD MUST BE DIGESTED?

- The most food that people eat consists of very **large molecules**.
- These molecules are so large that they cannot enter the bloodstream or cells directly.
- The cells cannot break down the carbohydrates and fats directly to obtain energy and they can also not use proteins for growth.
- These three organic compounds must first be broken down to simplest form.

WHAT DO CELLS REQUIRE?

- Digestion is similar to breaking down a house brick by brick.
- Bricks are the simplest building materials or building blocks of the house.
- Proteins are broken down (digested) in a similar way into their simplest and simplest chemical units, glycerol and fatty acids and carbohydrates must be broken down to simplest sugars.
- Building blocks can be taken to another place to build another type of house.
- Our cells can use the simplest building blocks that have been digested to build new organic compounds that are required by cells.



Digestion breaks down organic compounds to their simplest building blocks

HOW DOES DIGESTION TAKE PLACE?

- Animals require special mechanism to break down and digest food substances to the smallest possible particle.
- This is done in two ways:

Mechanical digestion

- Special organs **chew, tear, stir, push, mix and grind the food**, e.g. the teeth tear, chew and grind the food while the stomach **stirs grinds and mixes it**.

Chemical digestion

- The ground food is broken down further to smaller units by special chemicals called **digestive enzymes**. These enzymes break down the food substances and change it to **liquid form**.



Mechanical digestion – food substance are broken down to smaller particles

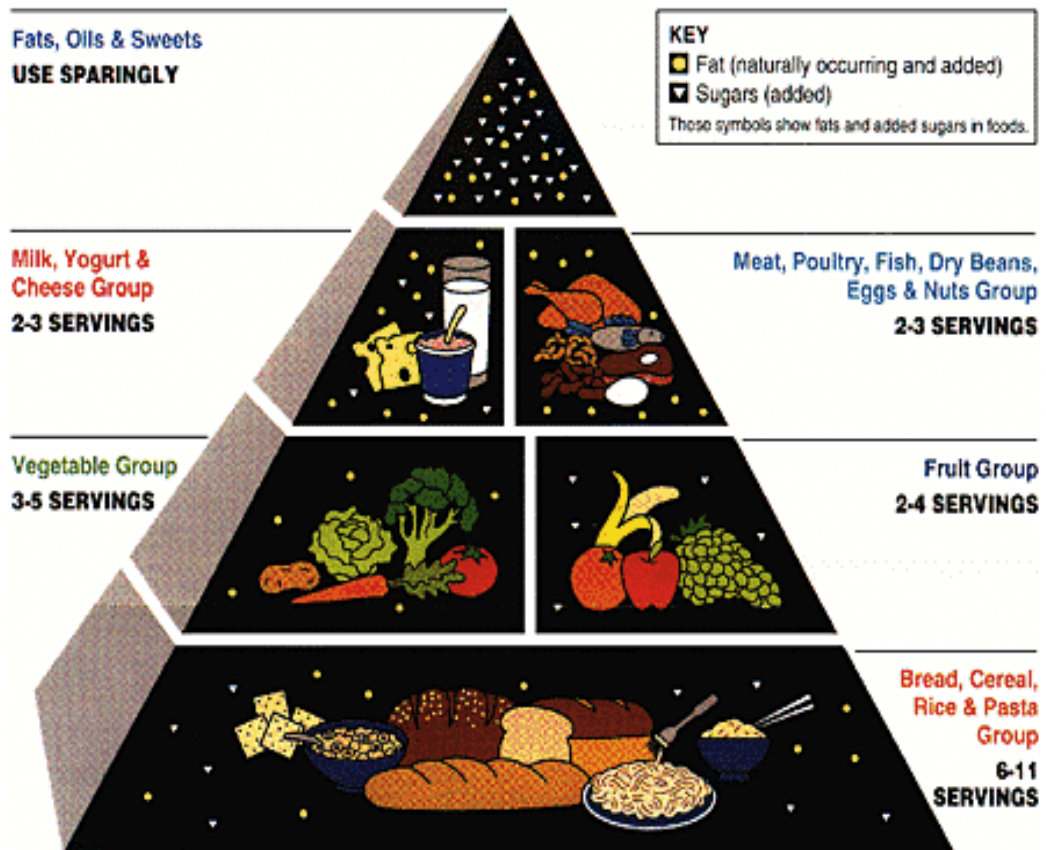


Chemical digestion – food substances are broken further to smaller units

NUTRITION AND YOUR HEALTH

A BALANCED DIET

- Diet is the daily food that we eat and fluids that we drink.
- A balanced diet is the diet that contains all the nutrients in sufficient quantities and in correct proportion required for normal growth and good health.
- These nutrients include proteins, fats, carbohydrates, and mineral salts.



MALNUTRITION

- Malnutrition means incorrect nutrition. This occurs amongst the rich and the poor. Poor people mostly suffer from under-nutrition while richer people suffer from over-nutrition.

UNDER-NUTRITION

- Under-nutrition is a condition where a child, teenager or adult does not take in enough of one or more of the essential nutrients.
- Under-nutrition is often caused by poverty but is also the result of traditional eating habits, excessive strict diets or of pure ignorance.

DEFICIENCY DISEASES

If one or more vitamins or minerals are not included in the diet, a deficiency disease can result. Some of the most common deficiency diseases include the following:

Deficiency diseases	Symptoms	Causes
Rickets	Bones soften and break.	Shortage of vitamin D.
Scurvy	Bleeding gums, low resistance to infectious diseases.	Shortage of vitamin C.
Night blindness	Inability to see in poor light	Shortage of vitamin A.
Beri-beri	Nerve and heart problems. Weekend muscles; paralysation.	Shortage of vitamin B ₁ .
Goitre	Enlarged thyroid gland.	Shortage of iodine.
Anaemia	Tiredness, weakness, decreased oxygen supply.	Shortage of iron.

DEFICIENCY DISEASES IN YOUNG CHILDREN AS A RESULT OF MALNUTRITION

Deficiency diseases	Symptoms	Causes
Kwashiorkor	Bloated stomach and swollen cheeks.	Shortage of proteins in diet.
Marasmus	Loss of muscles and the body becomes thin and weak. Drastic loss of mass, diarrhoea.	Diet low in both kilojoules and proteins. Starvation
Pellagra	Cracked, dry skin (especially cheeks), digestive diseases.	Shortage of B-group vitamins.

OTHER ILLNESS CAUSED BY UNDER-NUTRITION

- **Anorexia nervosa:** Is an illness affecting mostly teenagers and young women who believe that it is important to be thin with the result virtually no food taken in. This leads to a total dislike of food. Initially the person may feel good but gradually becomes thinner and thinner. Eventually she suffers from poor health and her body wastes away. Anorexia can cause infertility.
- **Bulimia nervosa:** People who suffer from bulimia can eat large quantity of food and then make themselves vomit because they are scared they will become fat. In both anorexia and bulimia, medical and psychological treatment is essential to prevent permanent damage.