

UPSC PRELIMS 2018



SCIENCE - NCERTS

Book

6TH NCERT

Chapter 1-5

No. of pages

46

46 pgs reduced to 8 pgs

**EFFECT : Studying time reduces from
2 hours 18 mins to JUST 24 mins**

YOUR BUDDY FOR PRELIMS - LAWXPERTSMV INDIA**CHAPTER 1 : Food: Where Does It Come From?**

FOOD - All living things need energy to do work and for growth and repair. They get this energy from the food. Our body uses this energy for doing work.

FOOD VARIETY - We eat different varieties of food like rice, bread, vegetables, eggs, butter, sweets, cheese, etc.

INGREDIENTS OF FOOD - Materials needed to prepare any food item are called ingredients. Two or more than two ingredients are needed to prepare a dish.

Example: To prepare boiled rice, rice and water are used, so rice and water are the ingredients for boiled rice.

Vegetables, salt, water and spices are used in cooking vegetable curry, so vegetables, salt, water and spices are ingredients of vegetable curry.

SOURCE OF FOOD MATERIALS- Plants and animals are the main sources of food.

FOOD FROM PLANT SOURCE: Rice, wheat, vegetables, fruits, etc. are obtained from plant source. We get these ingredients from certain parts of different plants.

ROOT - We eat root of radish, carrot, turnip, potato, sweet potato, beet, etc.

STEM - In certain plants the stem grows underground and store the food. Ginger, potato, and onion are stems of plants in which food is stored. So, we eat stem of ginger, potato, onion, etc.

LEAF - Spinach, Lettuce, Trigonella, etc. We eat leaves of these plants.

FRUITS - Guava, apple, banana, mango, papaya, orange, etc. We eat fruits of these plants.

OIL SEEDS – Seeds of many plants are used to extract oil. For example Mustard oil is extracted from seeds of mustard plant. Similarly sunflower oil,

coconut oil, groundnut oil, soyabean oil, etc. are obtained from seeds of respective plants.

SUGAR - We get sugar from sugarcane and beetroot.

TEA & COFFEE - We use tea leaves and coffee beans.

SPICE - We get many spices from plants like - pepper, cardamon, ginger, turmeric, cloves, cumin, etc.

FOODS FROM ANIMAL SOURCE:

- We get milk, eggs, meat, honey, fish, etc. from animals.
- Buffaloes and cow give milk. Hen and duck give eggs. We get meat from goat, chicken, hen etc.
- Eggs and meat are rich in protein. Fish is the major part of food for people living in the coastal regions.

HONEY – Honeybee produces honey from nectar of flowers. It is rich in sugars, minerals and enzymes.

AUTOTROPHS – Plants make their food themselves by the process of photosynthesis so they are called autotrophs.

HETEROTROPHS – Animals; including humans; do not make their food. They eat foods prepared by plants.

Heterotrophs are divided into following types on the basis of their food habit.

(a) HERBIVORES - Animals which eat only grass and plant products are called herbivores. Cow, Elephant, Camel, Deer, Goat, etc. are examples of HERBIVORES.

(b) CARNIVORES - Animals which eat flesh of other animals are called carnivores. Lion, jackal, frog, tiger, lizard, snake, etc. are examples of CARNIVORES.

(c) OMNIVORES- Animals which eat both plants and meat are called omnivores. Crow, monkey, bear, human, sparrow, etc. are examples of OMNIVORES.

(d) SCAVENGERS- Some animals which eat flesh of dead animals are called SCAVENGERS.

CHAPTER 2 : Components of Food

- The main components of foods are carbohydrates, protein, fats, vitamins and minerals. These are called **nutrients**.
- Carbohydrates- Carbohydrates are also called energy giving food. It is the main sources of energy. It is made up of carbon, hydrogen, and oxygen. There are three types of carbohydrates.

(a) Sugars- It is a **simple carbohydrate** having sweet taste. Sources of sugar are glucose, Sugarcane, milk and fruits; such as banana, apple, grapes, etc.

(b) Starch- It is a **complex carbohydrate**. It is a tasteless, colourless, white powder. Sources of starch are: Wheat, maize, potato and rice.

(c) Cellulose- It is present in plant cell wall. It is a complex carbohydrate. Humans **cannot digest cellulose**.

- Protein- protein helps in body growth and repairs the tissues so it is also called body building food. We get protein from milk, eggs, meat, fish and all kinds of pulse.
 - Protein molecule is made of a large number of smaller molecules called **amino acid**.
 - The daily requirement of protein for adults is 1 gram per kilogram of the body weight.
 - When the body is building new tissue, more proteins are required, so growing children and pregnant lady need more protein.
- Fat- Fats are made up of **carbon, hydrogen and oxygen**.
 - Butter, ghee, milk, egg-yolk, nuts and cooking oils are the major sources of fat in our food. An adult needs about 35 g fat everyday.
 - Our body stores the excess energy in the form of fat. This stored fat is used by the body for producing energy as and when required so fat is considered as energy bank in our body.
 - Fats are essential for the absorption of **vitamins A, D, E and K in the body**. Fat in our body also prevents heat loss from the body surface.

- **Vitamins-** Vitamins are complex organic compounds which are essential for the growth and maintenance of our body.
 - ✓ It **does not provide energy**.
 - ✓ Our body requires vitamins A, C, D, E, K and B-complex.
 - ✓ Our body can make only two vitamins, **Vitamins D and K** so other vitamins must be present in our food.
 - ✓ The B complex vitamin is a mixture of several water- soluble vitamins.
- **Minerals-** Minerals are required by our body in very small quantities. Iron, Iodine, calcium, phosphorus, sodium and potassium are common minerals.
 - ✓ The sources of these animals are plants and animals.
 - ✓ Some diseases caused by deficiency of vitamins and minerals.
- **Dietary fibers-**The fibrous indigestible material present in any food is termed as dietary fibre or roughage.
 - ✓ It helps in preventing constipation.
 - ✓ It adds bulk to the food and gives a sense of fullness after the meal. Salad, vegetables, sprouted grains and fruits are the sources of roughages.
- **Balance Diet-**The diet which contains all the essential nutrients in the right proportion is called a balanced diet. The food we eat must have all the nutrients. It should provide the required energy. Deficiency of one or more nutrients in our food for a long time may cause certain diseases or disorders.

CHAPTER 3 : FIBRE TO FABRIC

Fabrics are made up of strands called yarns, which are made from even thinner strands, called fibres.

Natural Fibres :

- Cotton, silk, wool and jute are called natural fibres as they are obtained from natural sources.
- We get cotton and jute from plants.
- We get silk from the cocoons of silk worms.

Synthetic fibres like nylon, polyester and acrylic were invented about a hundred years ago. These are manmade and are not obtained from any plant or animal sources.

Cotton fibre is obtained from cotton plants that grow in black soil in a warm climate.

WHERE? In India, cotton is grown in Gujarat, Maharashtra, Andhra Pradesh, Punjab, Haryana, Karnataka, Tamil Nadu, Rajasthan, Orissa and Madhya Pradesh.

HOW? The cotton plant bears fruits about the size of a lemon, called cotton bolls. The bolls are full of seeds and cotton fibre. They burst open when they are ripe.

PROCESS :

- The **cotton fibres are collected by hand from the ripe cotton bolls**. This process is called **picking**. Next, the cotton fibres are separated from the seeds by combing them. This is known as ginning. Earlier, ginning was done by hand, but nowadays, a machine is used.
- The cotton picked up from the plants has seeds in it. **The process of removing cotton seeds from pods is called ginning**. Ginning was traditionally done by hand. Now-a-days, machines are used in ginning.
- The **process of making yarn** from fibre is called **spinning**. The raw cotton is supplied to industry in the form of bales
- The **process of arranging two sets of yarn** together to make a fabric is called **weaving**. The big reels of yarn are called bobbins. These bobbins are used for weaving the cloth. Cloth is woven on looms. After that they bleached and dyed to give a finish
- Knitting can be done by hand and machine. Just two yarns are used in knitting, while more than two yarns are used in weaving. Sweater, socks, scarf and caps are knitted from the wool.

USES OF COTTION : Cotton is mostly used for making clothes of various kinds.

Examples: towels, bed-sheet, curtains, saris.

JUTE :

SOURCE : Jute fiber is obtained from the **stem of the jute plant.**

WHERE AND WHEN > It is cultivated in rainy season. Jute is grown in alluvial soil which is found usually in the Delta Region of the Ganges and Brahmaputra rivers. In India, jute is mainly grown in west Bengal, Bihar and Assam.

HOW> Jute plants are about 2.5 to 3.5 meter in height. It bears yellow flowers in 3 to 4 months. Jute plants are usually cut at the flowering stage.

- A good quality fiber is obtained from plants which are cut at the flowering stage.
- After falling of dry leaves bundles of dry plants are kept in a pond for a few days.
- In this period **the gummy skin rots out to separate the fibre. This process is called retting.**
- The jute fiber is obtained from the retted jute by hand.
- Jute fibre is pale- yellow in colour and 2to 3 meter long. Jute fibre is very strong. Jute fibre has silky texture.

USES : Jute fiber is used mainly for making gunny bags, shopping bags, ropes, carpets, curtains, etc.

WOOL : We get wool from hair of the sheep, goat, rabbit, yak and camel. Wool is used for making warm clothes, such as sweater, cap, shawl, gloves, and blanket, etc. Wool is also used in making carpets and upholstery.

SILK : We get silk from silk worm. Silk fiber is obtained from the cocoons of the silk moth. The silk moth lives on the leaves of mulberry plants.

- There are four stages in the life cycle of silk moth: eggs, larva, pupa and adult.
- The larva of the silk moth is called **caterpillar**. It secretes a sticky fluid fibroin from its salivary gland (silk gland). This sticky fluid forms a long thread. This thread is wrapped around the body of the caterpillar and forms cocoon. After this stage, the larva becomes a pupa and then turns into an adult moth.
- Silk is a costly fabric. Silk fiber is used for weaving cloth; especially traditional dresses in India; like sari, kurta, shawl and other wedding clothes. Silk had always been prized for its luster and fine quality.

SYNTHETIC FIBRE : Synthetic fibre is quite strong, wrinkle- resistant and quick drying. These are used in making different materials; like clothes, neck-ties, sails, sweater, shawls, carpet and blankets. They are also used in making boats, skating boards, etc.

Chapter 4 : Sorting Materials into Groups

- All things are made of one or more materials
- Same things can be made from different types of materials.
- It may be man-made or naturally occurring.
- Materials occupy space + have mass
- Materials can be classified on the basis of many criteria.
- Materials can be classified on the **basis of physical state**; as solid, liquid and gas.
 - ✓ **Solid:** Solid has definite shape and definite volume. Examples: Stones, wood, plastic, common salt, steel, ice, glass, etc.
 - ✓ **Liquid:** Liquid has indefinite shape but definite volume. Examples: Water, milk, oil, etc.
 - ✓ **Gas:** Gas has indefinite shape and indefinite volume. Examples: Oxygen, nitrogen, carbon dioxide, etc.

Other Criteria For Sorting Materials:

- **Appearance:** Different materials look different from each other. The appearance depends on colour, hardness, texture, and lustre.
- **Hardness:** hardness is another property of materials. Some materials are very hard while some are very soft.
- **Hard:** Material which are difficult to compress are called hard, e.g. diamond, stone, wood, steel, etc. Diamond is the hardest natural substance.
- **Soft:** Materials which can be compressed easily are called soft, e.g. chalk, cotton, rubber, etc.

Solubility or insolubility:

- **Soluble:** Material which easily dissolves in water is called soluble, e.g. salt, sugar, alum, etc.

- **Insoluble:** Material which does not dissolve in water is called insoluble, e.g. sand, chalk, iron, etc.
- **Transparent:** The material which allows light to pass through it is called transparent, e.g. acrylic sheet, glass, water, air, etc. Fig:Transparency
- **Opaque:** The material which does not allow light to pass through it is called opaque, e.g. wood, iron, asbestos, etc.
- **Translucent:** The material through which light can pass partially is called translucent, e.g. butter paper, thin curtain, etc.
- **Metals:** Materials which are hard, have such luster and are good conductors of heat and electricity are called metals, e.g. iron, copper, gold, etc.
- **Non-metal:** Materials which are brittle, which don't have luster and are bad conductors of heat and electricity are called non-metals, e.g. coal, chalk, rubber, soil, etc.

Chapter 5 : Separation of Substances

In the day to day life, there are times when one needs to separate a useful substance from a mixture. This is done by using various methods of separation of substance.

Mixture: A substance which is composed of two or more substances; in which each component retains its unique property; is called mixture. Air is a mixture of gases.

Water which we drink is a mixture of pure water and many other substances.

Pure Substance: A substance is called pure when each particle of the substance has the same unique property. For example; distilled water is pure water as each drop of it contains nothing but water.

Need for separation of substances: Taking out useful substances from a mixture is usually the main reason for separation of substances. Sometimes, we also need to separate substances when we need to use different components in different ways.

Separating solid from a mixture of solids