

LESSON NOTE FOR WEEK THREE (3)

SUBJECT: Biology

SUBJECT TEACHER: Mr. Princewill Wilson

TOPIC: THE DIGESTIVE SYSTEM: CLASSIFICATION OF MAMMALS BASED ON THEIR DIET

CONTENT

1. Herbivores
2. Carnivores and
3. Omnivores

Herbivores

These refer to all the animals that are plant-eating. Examples include grasshoppers, goat, cow, Grass cutter, rabbits, guinea pigs etc. They all feed on low vegetation such as grass. Giraffes and elephants feed on taller plants or shrubs.

Carnivores

These are animals that feed majorly on flesh or bones and other animals. They are referred to as the *primary consumers*. Some examples are fishes which eat aquatic insects and other fishes, toads and reptiles (Snakes, lizards, wall gecko), cats, dogs, and lions.

Omnivores

Omnivorous animals are animals that feed on both plants and animals, cooked and uncooked food. Some of the examples include, man, wild boar, bush and domestic pig, and the domestic fowl. Scavengers are animals that feed on the remains of dead animals are called scavengers e.g. Vultures.

Feeding Habits

Based on the modification on the feeding habits of organisms, we have the following;

1. Filter feeding, and
2. Fluid feeding adaptations in animals
3. Saprophytic
4. Parasitic feeding in animals and plants.

1. Filter Feeders

Some aquatic organism feed on some tiny microscopic organisms (planktons) in their habitat. A great number of them are **gathered, filtered and consumed** at the same time, **from the surface of the water**. Typical examples of filter feeders include; **water fleas, (Daphnia), mosquito larvae, fish such as herring, and molluscs such as oyster, and mussels.**

2. Fluid Feeders

Fluid feeders feed on soluble or fluid food materials from the body fluid of other animals or plants, or convert solid food into a liquid form before ingesting it. E.g of fluid feeders are bees, wasps, aphids, housefly, mosquito, tsetse fly, and butter fly.

3. Saprophytic Feeders

These are organisms which obtain their food materials from dead or decaying food materials or dead organic matters. They non-green plants and therefore cannot carry out photosynthesis. Typical examples include: many fungi, e.g. mushroom, mucor or rhizopus, penicillium and yeast as well as some bacteria.

4. Parasitic Feeders

In parasitic feeding, parasites are plants or animals which live and feed on or in other organisms and harm the hosts at the end. Parasites which live outside the body or the surface of their hosts are called **ectoparasites** e.g. tick, mites, lice and flaes. *These live the skin, or hairs of mammals. Those parasites which feed and live inside their hosts are called endoparasites e.g. tapeworm, roundworm etc.*

Feeding in Protozoa

Amoeba proteus is an example of a protozoan. It feeds on minute microscopic organisms including phytoplankton, diatoms, flagellates, bacteria, and decayed parts of plants in water. The presence of the food stimulates the formation of pseudopodia towards the object. Soon, the pseudopodia encircle the food material and taken into the body with a drop of water forming the food vacuole. The cytoplasm secretes digestive enzymes on to the **plasmagel**. Ingestion and egestion can occur at any time through the body surface.

Feeding in Hydra

Hydra is at tissue and considered as multicellular, aquatic organism (animal). It feeds mainly on tiny crustaceans e.g. water fleas. The food is usually caught by the tentacles with the aid of **nematocysts** which immobilize the prey. *The tentacles draw the prey into the mouth and then into the enteron (digestive cavity). The digestive enzymes in the enteron digest the food extracellularly. The absorptive cells ingest the partially digested food materials food material and complete digestion intracellularly. The soluble materials diffuse to various part of the animal. The waste products are egested through the mouth.*

Feeding Mechanisms

There are four modifications and mechanisms of feeding associated with some organisms. They include

1. Absorbing mechanism
2. Biting (cutting) chewing
3. Piercing and sucking
4. Trapping and absorbing

1. Absorbing mechanism

Organisms that use this mechanism has no mouth and alimentary canal, hence food is digested food is absorbed through its entire body surface from the intestine of its host. E.g tape worm, it attaches its self to its host through hooks and suckers.

2. Biting (cutting) chewing

Organisms with this mechanism have four different mouth parts adapted for biting and chewing. These mouth parts include:

Labrum or upper lip

Labium or lower lip

Mandibles

Maxillae

Examples of such organisms are cockroach and grasshopper.

3. Piercing and sucking

Organisms that possess this mouth parts have different modifications which enables them to adapt to feeding on food through mechanism of sucking. E.g mosquito and butterfly possess proboscis for piercing and sucking. For mosquito, the mouth parts altogether forms a strong Stylet. Housefly possess labella for sucking. It has the ability to convert solid food to liquid by secretion of saliva on the solid food.

4. Trapping and absorbing

This is common among plants that feed on insects. They are called insectivorous or carnivorous plants. E.g bladderwort, sundew, Venus flytrap, pitcher plant.

Feeding in Mammals

Mammals generally have heterodont dentition. They have incisors, canines, premolars and molars. Each tooth has a different shape and function. In human, there are two sets of teeth, namely: **temporary or milk teeth and permanent teeth.**

The Mammalian Teeth

The type of teeth possessed by a mammal is related to the type of food it eats. The number, arrangement and conformation of teeth in an organism are referred to as its **dentition**. When all the teeth are the same shape and size as in fishes, amphibians and reptiles it is called **homodont** dentition. When they differ in shape as in dogs, man and rabbits it is **heterodont** dentition.

Man has two sets of teeth during his lifetime; the milk teeth when young and the permanent teeth when mature. There are 20 milk teeth and 32 permanent teeth.

Types of Teeth

1. **Incisors** – These are flattened, chisel-like with a sharp edge for cutting and holding onto the food/prey. They are located in the front of the jaw.
2. **Canines** – These have sharp, pointed tips and are used for tearing flesh. They are next to the incisors.
3. **Premolars** – These have broad ridged surfaces called cusps. They are used for grinding and chewing food. They are located towards the back of the jaw.
4. **Molars** – These also have broad, ridged surfaces and are used for chewing and grinding food. They are found at the extreme back of the jaws.

Dental Formula

This refers to the number, type and arrangement of teeth in one half of each jaw.

Example in;

Man; I 2/2 ; C 1/1 ; PM 2/2 ; M 3/3

Dog; I 3/3 ; C 1/1 ; PM 4/4 ; M 2/3

Rabbit; I 2/1 ; C 0/0 ; PM 3/2 ; M 3/3

Structure of a Tooth

A typical tooth has three parts; the crown, the neck and the root. The crown is the part above the gum. The root is embedded in the jaw and the neck is the part on the same level with the gum, it is the narrow junction between the crown and root. The incisors and canines have one root each while the premolars and molars have two or three roots each.

The tooth is not rigidly fixed but can move slightly while biting and chewing. A hole at the tip of each root allows blood vessels and nerves of the pulp to be connected to those of bones and gums. This ensures a continuous flow of blood supply to the tooth and keeps the tooth alive. However, the supply of blood is not sufficient for the tooth to grow. This type of teeth is known as closed teeth.

Dental Care

Tooth decay caused by bacteria and fermentation of carbohydrates that get stuck in the teeth can be prevented by;

1. Practicing regular oral hygiene
2. Eating balanced diet containing enough vitamin, phosphorus and calcium.
3. Eating hard, fibrous fruits after each meal.
4. Avoiding sweet food, very hot and very cold.
5. Visiting a dentist regularly.

ASSIGNMENT

1. Explain the meaning of herbivores, carnivores and omnivores.
2. Explain feeding in protozoa and hydra.
3. List and give detailed explanations on feeding mechanisms.