

MODE OF NUTRITION WEEK NINE (9)

BIOLOGY SS1

Nutrition (Feeding)

Nutrition is the process by which food is taken in by living organisms in order to supply the nutrients required for the continuous metabolic reaction going on in the body. Food is the source of nutrients.

Types of nutrition

There are two (2) major types of nutrition namely;

1. AUTOTROPHIC NUTRITION: This is the type of nutrition in which organisms can manufacture their food and they are called autotrophs. There are two types of autotrophic mode of nutrition: they are

- Photosynthesis
- Chemosynthesis

Photosynthesis:

Autotrophic green plants synthesize food through the process of photosynthesis. Photosynthesis is a process by which green plants, having chlorophyll, synthesize the simple sugar (glucose) from the simple raw materials water and carbon dioxide using the energy of sunlight. Oxygen is released in this process.

Chemosynthesis

This is the process by which non-green plants (e.g. Nitrosomonas, Nitrobacter, iron bacteria etc) synthesize organic compound from inorganic materials (carbon dioxide and water). The energy used in this process is got from inorganic substances such as ammonia and hydrogen sulphite.

$\text{H}_2\text{S} + \text{O}_2 \gggg \text{S} + \text{H}_2\text{O} + \text{chemical energy}$

$\text{H}_2\text{O} + \text{CO}_2 \gggg \text{CH}_2\text{O} + \text{chemical energy}$

Examples are Nitrosomonas, Nitrobacter, Fungi, Nitrococcus.

2. HETEROTROPHIC NUTRITION: It is the type of nutrition in which organisms cannot manufacture their food but depend directly or indirectly on plants for their food. They are consumers. All animals and non-green plants like fungi come under this category. Depending upon the mode of living and the mode of intake of food, heterotrophs may be parasitic, saprophytic or holozoic.

Parasitic:

Parasitic organisms, or parasites, live on or inside other living organisms, called hosts, and obtain their food from them. The host does not get any benefit from the parasite. Different parasites, Cassytha, hookworms, tapeworms, leeches, etc., have different modes of feeding, depending upon habit, habitat and modifications.

Saprophytic:

Saprophytic organisms, or saprophytes, derive their food from dead organisms. They secrete enzymes that are released on food material outside their body. These enzymes break down complex food into simple forms. Common examples of saprophytes are fungi (moulds, mushrooms, yeasts) and many bacteria.

Holozoic:

In the holozoic nutrition complex, organic substances are ingested (taken in) without their being degraded or decomposed. After intake, such food is digested by enzymes produced within the organism. Digested food is absorbed into the body and the undigested product is egested (expelled) from the body. The feeding process is characterized by Ingestion, digestion, absorption, assimilation and egestion. Animals that exhibit this mode of nutrition can be classified into the following:

Herbivorous: Animals which feed on plants for nutrition. Eg. Cow, goat, buffalo etc

Carnivorous: Animals which feed on other animals or animal products. Eg. Tiger, lion

Omnivorous: Animals having mixed diets (feeding on both animals and plants and their products). E.g. Human, crow.

Carnivorous/Insectivorous Nutrition

This is a feeding process in which some plants that have special devices trap and digest insects. These plants grow in poor soil and proteins obtained from the insects are used to supplement their nitrogenous compound requirement. These plants secrete enzymes which help in digesting their victim. Examples include bladderwort (Utricularia), Pitcher plant, sundew and venus fly trap.

Feeding Mechanism in holozoic animals

1. Filter feeding is a method of aquatic feeding in which the animal takes in many small pieces of prey at one time. Filter-feeding is simply opening up your mouth and taking in whatever happens to be there while filtering out the undesirable parts.
2. Fluid feeding is defined as getting your nutrients by consuming the fluids of another organism. E.g butterfly.
3. Deposit feeding is the ingestion of particles comprising sedimentary deposits. Deposit feeders obtain food particles by sifting through the soil, they acquire food by swallowing large volumes of sediment.