

3.0 ANABOLISM

Anabolism is the building up of a complex molecule from a simple molecule.

Examples:

1. Formation of glycogen from glucose.
2. Formation of protein from amino acid.
3. Formation of fat & oil from fatty acid and glycerol.
4. Formation of photosynthesis from green plant.

FORMS OF ENERGY

1. Kinetic
2. Potential
3. Heat
4. Light
5. Chemical
6. Solar
7. Nuclear

3.1 LAW OF THERMODYNAMICS

Thermo means "heat" and dynamics means "changes". which means, Thermodynamics is define as heat changes.

FIRST LAW OF THERMODYNAMICS

It states that energy cannot be created nor destroyed but can be converted from one place to another. The food we eat contains chemical energy which is converted to heat and kinetic energy when running and walking.

SECOND LAW OF THERMODYNAMICS

It states that the conversion of energy from one form to another is not 100% efficient. There is decrease in the amount of useful energy from one trophic level to another.

3.2 ANIMAL NUTRITION

Plant are referred to as autotroph / producer because they can manufacture their own food through photosynthesis. While Animal are referred to heterotroph because they cannot manufacture their own food but depends in the food manufactured by green plants.

Classification of Animal Based on The Food They Eat

1. Carnivores: These are animals that feed on flesh e.g "Dog, Tiger, Lion"
2. Herbivores: These are animals that feed on grass or plant. e.g "Goat, Cattle"
3. Omnivores: These are animals that feed on both plant & flesh. e.g "Man Pigs"

3.3 CLASSES OF FOOD

1. CARBOHYDRATES

Carbohydrates is classified into three types;

* Monosaccharide (Simple sugar): They have only one unit of sugar. They have a general formula $C_6H_{12}O_6$. e.g "Glucose, Fructose, Galactose"

* Disaccharide (Reducing sugar): They contain two units of sugar and are represented by the formula $C_{12}H_{22}O_{11}$. e.g "Sucrose, Maltose, Lactose"

* Polysaccharides (Complex sugar): They consist of more than two simple sugars or several simple sugars joined together. They are represented by the general formula $C_6H_{10}O_5$. e.g "Starch, Chitin, Cellulose, Glycogen"

N.B:

Maltose \rightarrow glucose + glucose (Malted cereals)

Lactose \rightarrow glucose + galactose (Milk of mammalia)

Sucrose \rightarrow glucose + fructose (Sugar cane, sweet fruit)

3.3.1 IMPORTANT OF CARBOHYDRATE

- i. It provides energy required by animals for daily activities
- ii. It is used to build certain body parts.
- iii. Mucus which is an important lubricant in the body is made of carbohydrates

2. PROTEIN

Proteins are complex molecules and the simplest unit is amino acid, which is absorbed by the body.

Protein \gg Polypeptides \gg Amino acid

Protein is composed of carbon, hydrogen, oxygen, nitrogen, phosphorus, sulphur
Sources: Milk, Egg, Fish, Meat, Beans, Groundnut, Soyabeans

Important of Proteins

- i. It aids reproduction
- ii. It aids in production of enzymes
- iii. It helps in growth
- iv. It aids in productions of hormones

3. FAT AND OIL

Fat are solid while oil are liquid at room temperature. During digestion, Fats and oil are hydrolyzed into fatty acid and glycerol which is absorb by lymatic system. Fats and oil are made up of carbon, hydrogen and oxygen. e.g Palm oil, Fish, Groundnut, Soyabeans.

Important of Fat and oil

- i. It provide more energy to animal than carbohydrates
- ii. It helps in maintenance of body temperature
- iii. It supplies fatty acid to animals
- iv. It provide fat soluble vitamins

4. MINERAL SALT

Animal require various mineral salts for metabolic activities in the body, lack of these minerals result in nutritional deficiency

- i. Calcium: (source: egg, fish)

Functions;

- a. Bone and teeth formation & development
- b. blood clotting
- c. heart nervous system and musule

- ii. Phosphorus: (sources: Fish, wheat)

Functions;

- a. strong development of teeth & bones
- b. forms part of DNA & RNA
- c. forms respiration

iii. Magnesium: (sources: vegetable, milk)

Functions;

- a. for muscles contraction
- b. needed for utilization of iron
- c. for bone and teeth development

iv. Potassium: (source: fruit)

Functions;

- a. functioning of the muscles
- b. Transmission of impulse in nerves

v. Sulphur: (source: Beans, fish)

Functions;

- a. constituent of protein, amino acid and vitamin B

vi. Sodium chloride: (source: Table salt, fish)

Functions;

- a. Transmission of nerve impulse
- b. Maintenance of osmotic balance of the cell

vii. Iron: (source: Eggs, liver)

Functions;

- a. formation of hemoglobin in red blood cell

viii. Iodine: (source: sea food)

Functions;

- a. Required by the thyroid gland to produce thyroxine

5. VITAMINS

They are organic food substance required by man and other animals only in small amount for normal growth and healthy development.

Group of vitamins

- a. Fats soluble vitamin: They are vitamins that are soluble only in fat. e.g Vitamin A, D, E & K
- b. Water soluble vitamin: They are vitamins that are soluble in water. e.g Vitamin B

complex, and C

6. WATER

Water is made up of hydrogen and oxygen in the ratio 2:1 sources of water are river, tap, rain..

Important of water

- a. It aids digestion of food
- b. It required for metabolic activities in body
- c. It helps in maintenance of body temperature.
- d. It acts as solvent for soluble food substance in digestion.

REVISION EXERCISE

- [1] What is first and second law of thermodynamics
- [2] What is anabolism
- [3] What are important of water
- [4] What are important of protein
- [5] What is carnivorous, herbivorous and omnivorous animal
- [6] What are important of fat and oil
- [7] What are important of carbohydrate
- [8] List and explain the 3 types of carbohydrate
- [9] What are function of phosphorus in mineral salt
- [10] What are the functions of calcium in mineral salt

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