

WEEK ONE

PRINCIPLES OF ANIMAL NUTRITION

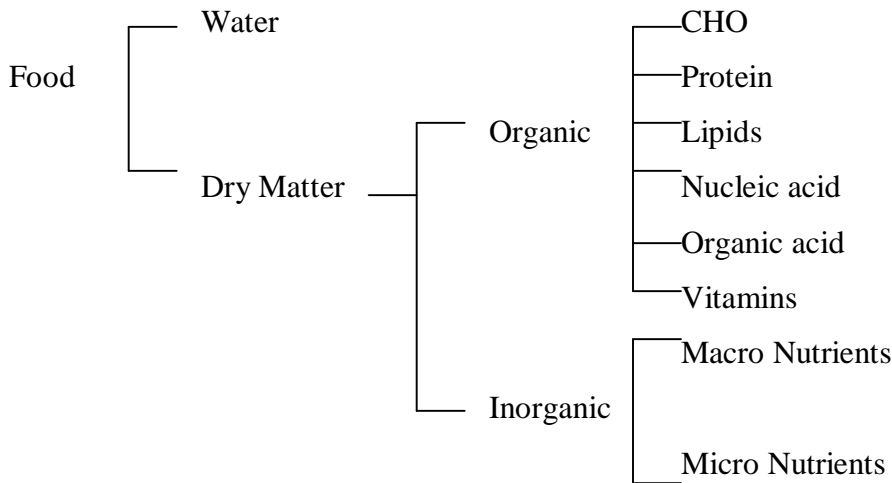
COMPOSITION OF ANIMAL BODY

Food is any material which after ingestion by animals is capable of being digested, absorbed and utilized for physiological processes. Food can be described as an edible material that nourishes. However, not all components of ingested materials are digested. For example, grasses and hay are described as food but they contain indigestible components. The components of food which are capable of being utilized by animals are described as **NUTRIENTS**.

The feed an animal consumes may vary from very simple compounds such as salt (NaCl) or sugar ($C_6H_{12}O_6$) to extremely complex mixtures provided by some plants and most animal tissues. Not all components will be usable nutrient, although some food of animal origin such as fish meal, meat meal, milk e.t.c are utilized in limited amount hence animals will have to depend heavily on plant products and their by-products.

The study of plant nutrition is important because animals depend on them for survival. Plants are able to synthesize complex food materials using simple substances such as CO_2 from the air and water and inorganic elements from the soil by means of photosynthesis. The greatest part of the energy is called chemical energy within the plant cells and it is this energy that the animals use for the maintenance of life and synthesis of its own tissues.

Plants and animals contain similar type of chemical substances. These substances can be grouped according to their constitution, properties and function. The main components of food are water and dry matter. Dry matter also has a component of organic and inorganic components of food.



WATER

Water is a major item in most animal's diet. The water content of animal body varies with age. New born or Neonates contains $750 - 800\text{gkg}^{-1}$ of water, but this reduces to about 500gkg^{-1} in mature fat animal. Water is vital to life and its contents should be maintained.

FUNCTIONS OF WATER

1. It acts as solvent in which nutrients are transported about the body.
2. Solvent in which waste products are excreted.
3. Many of the chemical reactions brought about by enzymes takes place in solution and involves hydrolysis.
4. Water helps in maintaining and/or regulating body temperature because of its high latent heat of vapourization.

Animals obtain water from three (3) main sources:

- a. Drinking water
- b. Water present in the food
- c. Metabolic water which is formed during metabolism by the oxidation of hydrogen containing organic nutrients.

Animals will normally drink water that is required for their daily activities.

NOTE: There is no evidence that under any normal condition that an excess of drinking water is harmful.

DRY MATTER (DM)

The dry matter of food is divided into organic and inorganic material. There is however no sharp distinction between them. This is because many organic compounds contain mineral element as structural component e.g carbohydrate contains phosphorus. The animal body contains very low carbohydrate. However, animals are almost entirely made up of proteins. *Animals' main energy store is in form of fat.* Older animals contain a much greater proportion of fat than young animals.

Proteins are the major nitrogen containing compound in the body of farm animals. Animal muscles, skin, feather, wools, nails, hoofs e.t.c contain proteins. Like proteins, nucleic acids are also nitrogen containing compounds and play a basic role in the synthesis of protein in all living organism. They carry genetic information in all living cells. Proteins are the major nitrogen containing compound in the body of farm animals. Animal muscles, skin, feather, wools, nails, hoofs e.t.c contain proteins. Like proteins, nucleic acids are also nitrogen containing compound and play a basic role in the synthesis of protein in all living organism. They carry genetic information in all living cells. Vitamins are present in animals in minute quantities. Many vitamins are important component in enzyme systems. Animals are limited in their ability to synthesize all vitamins and as such depend on external supply (supplementation). The organic matter contains all the elements other than carbon, hydrogen, oxygen and nitrogen. Potassium and phosphorus are the major inorganic component of animal tissue.