SCHEME OF WORK FOR ALPHA TERM

WEEK TOPIC

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| 1 | Introduction to food and nutrition –definition—importance of human nutrition- factors affecting human nutrition |
| 2 | Careers in food and nutrition |
| 3 | Relationship between food and nutrition to other subject |
| 4 | Basic food nutrient  --carbohydrate  --functions of carbohydrate  -food sources  -symptoms of dietary deficiency |
| 5 | Basic food nutrient:  -protein  -functions  -food sources |
| 6 | Symptoms of dietary deficiency  -Fats and oils  -functions  -food sources  -symptoms of dietary deficiency |
| 7 | Vitamins-water and fat soluble vitamins  -chemical names  -functions of each vitamins  -food sources  -symptoms of food deficiencies |
| 8 | Mineral salts and water:  -Functions  -food sources  -symptoms of deficiencies |
| 9 | Symptoms of dietary deficiencies  -Symptoms, signs, causes and cure e.g. kwashiorkor, marasmus etc. |
| 10 | The Digestive System:  Meaning of Digestion, Absorption, Assimilation and Metabolism  Digestion of food in the mouth, stomach and small intestines |
| 11 | Enzymes involved in Digestion  Absorption of nutrients, the role of water in digestion and absorption |
| 12 | Revision |
| 13 | Examination. |
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WEEK 1

INTRODUCTION TO FOOD AND NUTRITION

The search for food has been the occupation of mankind from the onset. Food is very important to our day to day life.

Food can be defined as what nourishes the body. It is any substance which after consumption, digestion and absorption produces energy, promotes growth, repair body tissues and regulate all body processes.

Food is able to perform all these functions because of the chemicals present in it which is known as nutrients.

The study of these various nutrients in relation to the effect it has on human body is nutrition. Nutrition is therefore is the science of food in relation to health.

Importance of human nutrition .

1. Food is important to man

2. There is strong correlation between good food and intellectual development.

3. It helps in maintenance of good health.

4. To know the principles of food processing, food preservation and food preparation.

5. People that are well fed have more resistance to diseases than those that are poorly nourished.

6. To know the kind of food that could meet the dietary requirements of different age groups and those under psychological condition.

7. The proportion of food consumed has positive or negative effect on the body.

8. It helps to understand the basic knowledge and principles of nutrition.

Factors affecting human nutrition include:

1. Availability of food.

2. Income.

3. Food in season.

4. Ignorance

5. storage/preservation.

6. Facilities available.

WEEK 2

Careeropportunities available in foods and nutrition are:

1. Teaching.

2. Dietetics.

3. Hospitality and tourism

4. Food science.

5. Food science and technology.

6. Food engineering.

7. Hotel and catering management.

8. Food research and development.

9. Community nutrition.

10. Institutional matron.

11. Clinical nutrition.

12. Nutrition in media.

Evaluation: mention the importance of human nutrition.

WEEK 3

Relationship between food and nutrition to other subjects.

Food and nutrition is not an independent subject rather it is an area of study that cut across many other disciplines and also has a vital role to play in the continual existence of the human race.

Food and nutrition cannot be divorced from agriculture. Their relationship is so strong that both comes under one world organization: **FAO**

The food and agriculture organization which has its headquarters in Rome. The food consumed by man can be majorly derived from plants and animals, on the other hand, animals depend solely on their food. Therefore for food to be abundant for human consumption, both plants and animals must be catered for. This means agriculture which encompasses both crops and animals must be taken seriously and practiced widely.

The related subjects are:

1. Agricultural science.

2. Biology.

3. Chemistry

4. Physiology.

5. Food technology.

6. Home economics.

7. Food science.

8. Food engineering.

9. Micro biology.

10. Medicine.

11. Economics.

12. Physics.

13. Physical & health education.

WEEK 4

BASIC FOOD NUTRIENTS

Nutrients that are required in a fairly large quantity by the body are referred to as macro **nutrients** while micro nutrients are required in a very little quantity. All these nutrients perform specific functions in the body and their lack or shortage in our diet results to deficiencies.

**CARBOHYDRATES**

Carbohydrates are made up of carbon, hydrogen and oxygen. They are mainly produced by plants through the process of photosynthesis. Animals obtain carbohydrate by consuming the carbohydrate synthesis by the plants. Carbohydrates can be classified into three namely:

1. Monosaccharaides.

2. Oligosaccharides

3. Polysaccharides.

Monosaccharaides

These are the smallest units of carbohydrates referred to as simple sugar e.g. glucose, fructose, GA lactose etc.

Oligosaccharides

These are the carbohydrates that are made up of between 2 and 10 monosaccharaides units joined together e.g. maltose, lactose, sucrose etc.

Polysaccharides

They are made up of more than ten units of monosaccharaides joined together e.g. starch, cellulose, pepsin etc.

Functions of carbohydrates.

1. It serves as sources of heat and energy to the body.

2. It spares protein hence prevents its wastage.

3. It adds bulk to faces.

4. It assists in the complete oxidation of fats in the body.

5. It gives flavor and variety to the diet.

Food sources of carbohydrates

Food sources of carbohydrates include yam, rice, bread, cassava, maize, cocoyam, millet, oat, barley, rhye, wheat, sugarcane, sorghum, guinea corn, plantain etc.

***Week five***

***Topic: PROTEINS***

Protein is another macro nutrient required by the body. Protein is made up of carbon, hydrogen nitrogen, and oxygen. The major structural unit of protein is amino acid. Protein can be classified into two. Protein that contain all the essential amino acids are called first class or complete or animal proteins. The other class of protein is the second class or incomplete or plant protein because they lack one or more of the essential amino acids.

Functions of proteins

1. It promotes growth.

2. It repairs worn out tissues.

3. It serves as source of energy in the absence of carbohydrate and fats.

4. It builds anti-bodies that fight against infections and diseases.

5. It builds enzymes to catalyze chemical reactions of the body.

6. It builds hormones that assist in the regulation of body processes.

7. It forms the major structural component of the cells.

8. It is responsible for the transmission of hereditary traits or characteristics from parents to off springs.

DEFICIENCY OF PROTEINS.

The deficiency of protein leads to poor growth and lower resistance to infections. In infants, it leads to kwashiorkor and marasmus.

Food sources of proteins

Protein can be obtained from animals and their products. Such as egg, beans, groundnut, milk, cheese, fish, poultry, soya beans, meat, peas etc.

***Week 6***

***Topic: FATS AND OILS***

Fats and oils

Fats and oil are another group of macro nutrients that is required by the body. It composes of carbon, oxygen and hydrogen. Excess carbohydrates and proteins can be converted into fats and stored under the skin. The structural unit of fats and oils are glycerol and fatty acid.

Differences between fats and oils

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| --- | --- |
| Fats | Oils |
| 1. Fats are solid at room temperature. | Oils are liquid at room temperature. |
| 2. Fats contain saturated fatty acid. | Oils contain unsaturated fatty acids. |
| 3. Fats are obtained from animals. | Oil is obtained from plants and vegetables. |

**Functions of fats and oils**

1. It serves as source of heat and energy.

2. It acts as insulator, thus preventing heat loss from the body.

3. It acts as cushion to the delicate internal organs, hence, it protects them against shock and damage.

4. It contribute to flavor and palatability of food.

5. It provides satiety, hence, delay the onset of hunger because they are not digested easily.

6. It facilitates the absorption of fat soluble vitamins.

7. It promotes healthy hair and skin.

Although, fairly large amount of fat and oil are needed by the body but the excessive consumption can lead to **overweight** or **obesity.**

Food sources of fats and oils are margarine, butter, edible oils such as: palm oil, groundnut oil, corn oils, soybeans oil, vegetable oil etc.

***WEEK 7***

***Topic: Vitamins.***

Vitamins are inorganic in nature. They are required in a very little quantity by the body. Vitamin can be classified into two main groups:

1. Water soluble vitamins.

2. Fat soluble vitamins

1. Water soluble vitamins: these are vitamins that dissolve in water. E.g. the B complex(B1) , B2, B6, B12, B15, folic acid, niacin, biotin pantothenic acid, and vitamin C (ascorbic acid).

2. Fat soluble vitamins: these are the vitamins that can dissolve in fat and oil. These include;

ADEK: vitamin A, D, E and K

Some vitamins be synthesized from other substances in the body, such substance or compound that can be converted into the acting vitamins are called the **pro-vitamins**. Similarly, some substances interfere the proper utilization of and function of vitamins in the body. Such compounds substances are known as **anti-vitamins.**

**VitaminB1**

Its chemical name is thiamine.

Functions: - it promotes growth and increases appetite.

- It is involved in the release of energy.

-it prevents beriberi

Food sources: whole cereals, nut, legume, pork, offal, etc.

**Vitamin B2**

Its chemical name is riboflavin.

Functions: -it is involved in the release of energy from carbohydrate food.

-it assists in the formulation of red blood cells and antibiotics.

- It promotes growth.

Food sources: whole cereals, offal, milk, legumes, cheese, egg, yeast, leafy vegetable.

**Vitamin B3**

Its chemical name is niacin – it is resistant to air, heat, and light.

Functions: - it improves the appetite.

* It assists in the correct function of the skin and nerves.
* It is involved in energy release from carbohydrate food.

It promotes growth.

**Vitamin B5**

its chemical name is panthothenic acid.

Food sources are: legume, milk, whole cereal, yeast, offal, fish, egg, lean-meat and cheese.

Its chemical name is pantothenic acid.

Functions: -it is essential for the metabolism of carbohydrate, protein and fat.

Food sources are meat, legume, nut, fish, egg, whole cereal, yeast.

Vitamin B6

Its chemical name is pyridoxine.

Functions: -it assists in the formation of antibodies and the synthesis of genetic material.

* It acts as co-enzyme in protein and fat metabolism.

Food sources are whole cereal, leafy vegetable, legume, fish, nut, offal’s, meat, milk and egg.

**Vitamin B12**

Its chemical name is cyanocobalamine.

Functions: - assists in the formation of red blood cells.

* It assists in the prevention of anemia.

Food sources are fish, meat, liver, kidney, offal’s, milk.

**Vitamin C**

Its chemical name is ascorbic acid - it is a simple sugar, it is the most active naturally occurring and reducing agent in living tissues.

Functions: - formation of collagen

* Prevents scurvy.
* Prevents cold.
* Prevents infections.
* Promotes healing of wounds.
* Assists in the formation of adrenal gland.
* It is responsible for formation and maintenance of connecting tissues.

food sources are fresh fruit (citrus fruit) egg mango, orange, water melon, guava, black currant etc. green leafy vegetables egg okra, tomatoes, garbage, spinach.

***Fat soluble vitamin***

**VITAMIN A**

Its chemical name is retinol

Functions: - it aids bright vision

* Development of healthy skin.
* Essential for normal growth especially in children.
* for good development and maintenance of the lining of the internal membrane.

**VITAMIN D**

Its chemical name is cholecalciferol

Functions: - it enhances the absorption of calcium and phosphorus in the body.

* It is responsible for good development of strong and healthy bones and teeth.

food sources are:- milk and milk products, fish, egg, yam, palm oil, margarine, action of ultra violet rays from the sun on the skin.

**VITAMIN E**

Its chemical name is tocopherolis.

Functions:-it acts as anti-oxidant especially in fats and oil

* it acts as anti-sterility factor
* It aids absorption of iron in the body.

Food sources are whole cereals, green leafy vegetables, eggs, liver, milk, margarine.

**WEEK 8**

**MINERAL ELEMENTS**

Mineral elements are also required in a very minor quantity by the body. They are inorganic in nature and perform a variety of functions like growth and vital metabolic activities. Mineral elements are usually classified into two groups.

1. Macro elements.

2. Micro elements.

The macro elements are also called trace elements and they include sodium, calcium, magnesium, potassium, chlorine, Sculpture and phosphorus while the micro elements are iron, copper, zinc, manganese, iodine, fluorine, cobalt, selenium and chromium.

The macro elements

Calcium (CA): functions development of strong and health teeth.

* It controls cell activities.
* It is essential for blood clothing.
* Transmission of nerve rhythmic hearth beat.
* Aids normal functioning of the muscle.

Food sources of calcium are; milk and milk water, hard water, sea food, green vegetables, fruits.

MAGNESIUM (Mg): functions; development of bones

* Regulates muscles contraction.
* it is responsible for the transmission of nerve

Food sources of magnesium are hard water, sea food and nuts.

PHOSPHORUS (P): functions; development of bones.

* Maintenance of acid­ - base balance of body fluids.
* For storage and release of energy.
* Essential for the reproduction of cells.

Food sources are; green vegetables, egg yolks, sea food, liver, cereals, meat, pulses, lime.

SODIUM (Na): functions; maintenance of cell

* It aids the secretion of hydro chloric acid in the stomach.

Food sources are; table salt, meat, milk, cheese, egg, sea food, green vegetables, and poultry.

SULPHUR (S): functions; essential for the development of hair and nails and for the formation of connecting tissues.

Food sources of Sulphur are; cabbage, meat, fish, egg and nuts.

POTASSIUM (K) : functions; maintenance of cell membrane permeability.

* It is involved in electrolyte balance in the body.
* it is meant for nervous irritability and muscle contraction

Food sources are ; meat, potatoes, banana, peanuts, carrot, orange, grape fruit, butter.

*MICRO mineral elements*

IRON(Fe) : functions ; essential for the formation of heamoglobin of red blood cell.

Food sources are meat, liver, kidney, green vegetables, legumes, whole cereals.

FLUORINE(F) : functions ;important in the development of strong bones and healthy teeth.

* Prevents dental decay.

food sources are ; fluoridation of drinking water and tooth paste.

***WATER.***

Water is very important for the existence of man. the chemical composition of water is hydrogen and oxygen.[H2O]. It has no energy value. it is neutral, colorless, odorless and tasteless. Water makes up about two thirds of the total body composition. It is important in regulating body processes.

*functions of water in the body*

1. water serves as the medium for the transportation of substances from one part of the body to another.

2. it regulates the body temperature.

3. it quenches thirst.

4. Assists in the excretion of waste products from the body e.g. urea, which is excreted by the kidneys and passed out as urine.

5. Water aids the digestion of foods and absorption of nutrients.

6. It keeps the lining membranes of organs moist e.g. bone joints, eyes i.e. it acts as a lubricant.

Sources: the main source of water for the body is the drinking water. it also come into the body through beverages, beer and some other foods we consume.

*WEEK 9*

*DIETARY DEFICIENCY*

Some diseases are caused by lack of or shortage of specific nutrients in the meals we take, when this happens one begins to show signs of health imbalance. When a diseases is caused due to excess or lack of specific nutrient, the diseases are called malnutrition. To correct this, an intake of the nutrient which is lacking should be increased. Therefore malnutrition means imbalance of nutrient intake due to the consumption of too little or too much of one or many nutrients. There are two types of malnutrition:

Under nutrition which is a condition resulting from an inadequate intake of food or poor utilization of nutrients in food; while over nutrition means excessive intake of one or more of the to the detriment of the proper functioning in the body system.

1. Kwashiorkor: It is mostly common in children it is caused largely by lack of protein in the diet.

Symptoms: Enlarge stomach

Hair changes color and looks thin

Swollen legs

The child looks miserable

Skin becomes scaly

Retardation of growth and development.

Treatment: Protein food should be increased in the child diet

2. Marasmus: This is a protein-calorie deficiency diseases

Symptoms: Growth is stunted

The child looks like an old person or a living skeleton.

Body tissue wastes away and becomes saggy, rather than firm.

Treatment: The child's diet should have high protein content esp animal protein.

It should contain other protein food, mixture should be given to increase the calorie according to child's age, but gradually administered.

3. Anemia: The deficiency is caused by inadequacy of Iron in the diet. It is common with children and women, women lose blood regularly during menstruation and during child-birth.

Symptoms: Weakness, fainting, paleness of skin.

Treatment: The diet intake should include liver, eggs, spinach,etc . Assignment: List other 5 dietary deficiencies, symptoms, and their treatments.

WEEK 10

THE DIGESTIVE SYSTEM

The food taken into our mouth requires some kind of alteration before they can be absorbed into the blood stream.

Digestion is the process by which food molecules are broken down into various small substances that can be absorbed into the blood stream and assimilated into the cells for utilization. Digestion is mainly a chemical process brought about by the action of many enzymes.

The whole process of digestion takes place in the ALIMENTARY CANAL, which takes place in four major sections that is, the mouth, stomach, duodenum and small intestine.

The mouth: In the mouth, the food is mixed and softened with the saliva secreted by many enzymes and masticated and crushed into smaller particles by the teeth. Saliva contains mucin which lubricates the food and makes swallowing easier, it also provides an alkaline medium necessary for the action of ptyalin, an enzyme.

The stomach contains gastric juice which is acidic due to the presence o of hydrochloric acid [HCL].The hydrochloric acid performs three major functions viz:Stops the action of ptyalin from the mouth.

2.provides the acidic medium necessary for the action of rennin and pepsin in the stomach.

3.Destroys any bacteria that might have accompanied the food from the mouth.

From the stomach, the product of digestion are passed into the duodenum. The pancreatic juice from the pancreas is secreted into the duodenum and the bile from the liver are emptied into the duodenum through the bile duct. The bile does not contain any enzyme rather it emulsifies the fats or oils present in the chime.

The pancreatic juice on the other hand contains carbohydrate, protein, and fat splitting enzymes.

Amylase-- converts starch to maltose

Trypsin-- converts protein to peptides and peptones.

Lipase--converts fats to fatty acid glycerol.

WEEK 11

**ABSORPTION**

The process by which the end products of digestion pass through the lining of the digestive tract is called absorption. Absorption takes place through the inner lining of the small intestine called villi. the simple sugar and amino acids enter into the blood directly while the fatty acids enter the blood system indirectly through the lymphatic system.

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| **Site** | **Digestive juice** | **Optimum pH** | **Enzyme** | **Functions (reactions)** |
| Mouth | Saliva | Alkaline | Ptyalin | Starch maltose |
| Stomach | Gastric juice | Acidic (due to the presence of hydrochloric acid) | Pepsin  Renin | Converts protein to peptide and peptone.  Acts on milk proteins only and curdles it by converting the caseinogen (soluble) to casein (insoluble) |
| Duodenum | Bile secreted by the gall bladder  Pancreatic juice produced by the pancreas | Alkaline  Alkaline | Contains no enzyme but bile salts amylase  Trypsin lipase | The bile salts emulsify the fats.  Starch maltose  Protein peptides/peptones  Fats fatty acids and glycerol |
| Small intestine or ileum | Intestinal juice | Alkaline | Maltase  Lactase  Sucrose  Peptidase  Lipase |  |

**Assignment:** draw and label fully a diagram showing the alimentary canal.