

# CULINARY ART

## Level-II

Based on March 2022, Curriculum Version I



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## Acknowledgment

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## Acronym

**ALA**..... ( $\alpha$ -linoleic acid)  
**EPA**..... (eicosapentaenoic acid)  
**DHA**..... (docosahexaenoic acid)  
**FD A**.....Food Drug administration

## Introduction to the Module

In Culinary Art filed; Apply nutrition knowledge, a refers to knowledge of the concepts and processes related to nutrition and health, including diet and health, diet and disease, dietary guidelines and recommendations This module is designed to food and health requirements under nutrition knowledge occupational standard, particularly for the unit of competency: apply nutrition knowledge.

### This module covers the units:

- Basic nutrients on food items
- Balanced diet.

### Learning Objective of the Module:

- Identify the basic nutrients on food items
- Apply Balanced diet.

### Module Instruction

For effective use this modules trainees are expected to follow the following module instruction:

1. Read the information written in each unit
2. Accomplish the Self-checks at the end of each unit
3. Read the identified reference book for Examples and exercise

## Unit one: Basic nutrients on food items

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Food sources and digestion process.
- Exploring Sources of information about nutrition and diet.
- Identifying food additives and preservative.
- Nutritional guideline for healthy.
- Understanding effects of various cooking method on nutrients

This guide will also assist you to attain the learning outcomes stated in the cover page.

Specifically, upon completion of this learning guide, you will be able to:

- Explore food sources and digestion process.
- Establish sources of information about nutrition and diet.
- Identify food additives and preservatives.
- Apply nutritional guidelines for healthiness.
- Understand effects of various cooking methods on nutrients.

### 1.1. Food sources and digestion process

Nutrients are certain chemical compounds that are present in foods and that fulfill one or more of the following functions:

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- Supply energy for body functions.
- Build and replace cells that make up body tissues.
- Regulate body processes.

### 1.1.1. Type of nutrients

#### A. Carbohydrates

Carbohydrates or saccharides (saccharo is Greek for “sugar” is polyhydroxy aldehydes or ketones, or substances that yield such compounds on hydrolysis. The term “carbohydrate” comes from the observation that when you heat sugars, you get carbon and water (hence, hydrate of carbon). Carbohydrates are the body’s most important source of food energy .Fats and proteins can also be burned for energy, but the body uses carbohydrates first. If no carbohydrates are available, the body then burns fat. Carbohydrates are compounds consisting of carbon, hydrogen, and oxygen atoms bound together in chains of varying lengths. Sugars are simple carbohydrates. Simple sugars, such as glucose, are small compounds containing 6 carbon atoms. Table sugar, or sucrose, is a larger sugar molecule with 12 carbon atoms. Sugars are found in sweets and, to a lesser extent, in fruits and vegetables. The simplest form of carbohydrates is the monosaccharide. 'Mono' means 'one' and 'saccharide' means 'sugar'.

Carbohydrates, in general, may be classified into two classes:

1. **Sugars.** These are crystalline substances which are sweet and water soluble. For examples, glucose, fructose and cane sugar.
2. **Non-sugars.** These are tasteless, insoluble in water and amorphous. For example. Starch, cellulose, etc.

**Monosaccharide’s:-** are polyhydroxy aldehyde or ketone that cannot be hydrolyzed further to give simpler sugar.

They may again be classified on the basis of the nature of carbonyl group.

Polyhydroxy aldehydes are called aldoses. Example: Glucose

Polyhydroxy ketones are called ketoses. Example: Fructose

#### Properties of monosaccharide

- Colorless - shape crystalline.
- Solubility water soluble
- Taste - sweet



They give two monosaccharide units on hydrolysis, which may be the same or different. For example, sucrose on hydrolysis gives one molecule each of glucose and fructose, whereas maltose gives two molecules of glucose.

**Disaccharides:** - When two monosaccharides are combined together with elimination of a water molecule it is called disaccharide.

- Monosaccharides are combined by glycosidic bond.
- Disaccharides consist of two sugars joined by an **O**-glycosidic bond.

The most abundant disaccharides are sucrose, lactose and maltose. Other disaccharides include isomaltose, cellobiose and trehalose.

Sucrose also called saccharose, is ordinary table sugar refined from sugar cane or sugar beets.

Hydrolysis of sucrose (optical rotation  $+66.5^\circ$ ) will produce one molecule of glucose ( $+52.5^\circ$ ) and one molecule of fructose ( $-92^\circ$ ).

- **Lactose**

Lactose is the sugar present in milk. It is reducing disaccharide.

- **Maltose**

Maltose consists of two  $\alpha$ -D-glucose molecules. It is a reducing disaccharide

**Oligosaccharides:**-Carbohydrates that produce two to ten monosaccharide units during the hydrolysis are called oligosaccharides. They can be further classified based on the number of monosaccharide units formed on hydrolysis

**Polysaccharides:-** These carbohydrates give a large number of monosaccharide units on hydrolysis. These monosaccharide units are joined together by oxide bridges. These linkages are called glycosidic linkages. The common and widely distributed polysaccharides correspond to the general formula  $(C_6H_{10}O_5)_n$ . Polysaccharides are not sweet in taste, so they are called non-sugars. Some common examples are starch, cellulose, glycogen

- **Glycogen**

Glucose is stored as glycogen in animal tissues by the process of glycogenesis. When glucose cannot be stored as glycogen or used immediately for energy, it is converted to fat.

Glycogen is a polymer of  $\alpha$ -D-Glucose identical to amylopectin, but the branches in glycogen tend to be shorter (about 13 glucose units) and more frequent. The glucose chains are organized globularly.

## Source of carbohydrates

Starches are complex carbohydrates consisting of long chains of simple sugars bound together. They are found in such foods as grains, brea, peas and beans, and many vegetables and fruits. Carbohydrates act as energy reserves, also stores fuels, and metabolic intermediates.

Ribose and deoxyribose sugars forms the structural frame of the genetic material, RNA and DNA.

- Polysaccharides like cellulose are the structural elements in the cell walls of bacteria and plants.
- Carbohydrates are linked to proteins and lipids that play important roles in cell interactions.
- Carbohydrates are organic compounds; they are aldehydes or ketones with many hydroxyl groups

However, if fats are burned with no carbohydrates present, toxic compounds called ketone bodies are produced. If too many ketone bodies accumulate, a condition called ketosis develops, and the blood becomes unable to carry oxygen properly. The result can be fatal. Thus one of the important functions of carbohydrates is to help the body burn fat properly. About 50 to 100 grams of carbohydrates are needed every day to prevent ketosis.

## B. Fats

Fats are mostly made of carbon and hydrogen and do not mix well with water. Most dietary fats, called triglycerides, are made with three fatty acids. Fatty acids can be saturated (full of hydrogen), monounsaturated, or polyunsaturated, depending on how much hydrogen can be added to them.

### • Saturated fats

Saturated fats are provide concentrated energy, tend to be solid (e.g., in butter and lard), and promote high blood cholesterol.

### • Monounsaturated

Monounsaturated fats are a healthy form of concentrated energy (e.g., in olive, canola, and peanut oils) and are less likely to spoil than polyunsaturated fats. Certain polyunsaturated fatty acids

- **Polyunsaturated fatty acids (PUFA)** are in the diet are essential to good health and cannot be made by humans. The omega-3 fatty acid family includes ALA ( $\alpha$ -linoleic

acid), EPA (eicosapentaenoic acid), and DHA (docosahexaenoic acid). Rich vegetable oil sources are flax and canola. Fish oil (e.g., salmon) is rich in EPA and DHA. Omega-3 refers to the last opening for hydrogen being 3 positions from the end of the fat molecule.

### C. Proteins

Proteins derive their name from the Greek word proteos, of “prime importance.” The body can manufacture most of the necessary carbohydrates (except fiber) and lipids (except a few essential fatty acids) it needs, but when it comes to protein,

The body can synthesize only about half of the compounds it requires in order to manufacture the proteins needed for the body. These substances needed for protein manufacture are called amino acids. Of the 22 amino acids, 9 are essential nutrients and thus must be obtained daily from the diet.

Twenty percent of the human body is made up of proteins. Proteins are the large, complex molecules that are critical for normal functioning of cells. They are essential for the structure, function, and regulation of the body’s tissues and organs.

Proteins are made up of smaller units called amino acids, which are building blocks of proteins. They are attached to one another by peptide bonds forming a long chain of proteins

#### Amino acid structure and its classification

- An amino acid contains both a carboxylic group and an amino group. Amino acids that have an amino group bonded directly to the alpha-carbon are referred to as alpha amino acids.
- every alpha amino acid has a carbon atom, called an alpha carbon,  $C\alpha$  ; bonded to a carboxylic acid,  $-COOH$  group; an amino,  $-NH_2$  group; a hydrogen atom; and an R group that is unique for every amino acid

#### Protein Quality in Foods

Foods vary in their protein quantity and quality. Most protein from animal sources—meat, poultry, fish and shellfish, milk (cheese, yogurt, etc.), and eggs—is complete protein. Gelatin is one of the few animal proteins that is not complete. Plant protein, with the exception of that from soybeans and certain grains (quinoa and amaranth), is incomplete protein and will support maintenance, but not growth

**Complete protein** A protein, usually from animal sources, that contains all the essential amino acids in sufficient amounts for the body’s maintenance and growth

**Incomplete protein** A protein, usually from plant sources, that does not provide all the essential amino acids.

**Composition of Proteins** One key way in which proteins differ from carbohydrates and lipids is that proteins contain nitrogen atoms, whereas carbohydrates and lipids contain only carbon, hydrogen, and oxygen atoms. These nitrogen atoms give the name —amino, meaning —nitrogen containing, to the amino acids of which protein is made. Protein molecules resemble linked chains, with the links being amino acids joined by peptide bonds.

### Classification Amino Acid

- a. Essential for all humans
- b. Histidine
- c. Isoleucine
- d. Leucine
- e. Lysine
- f. Methionine
- g. Phenylalanine
- h. Threonine
- i. Tryptophan
- j. Valine

### Non essential

- Alanine
- Arginine
- Asparagine
- Aspartic acid
- Cysteine
- Glutamic acid
- Glutamine
- Glycine
- Proline ,Serine and Tyrosine

### Related compounds

As amino acids

- Carnitine
- Cystine

- Hydroxyglutamic acid
- Hydroxylysine
- Hydroxyproline
- Norleucine
- Taurine and Thyroxine

### Functions of Proteins in Food

The proteins in foods allow several important reactions to occur during food preparation:

- Hydration
- Denaturation/coagulation
- Enzymatic reactions
- Buffering and Browning

**Hydration:** - the ability of proteins to dissolve in and attract water, a process called hydration, allows them to play several important roles in foods. One of these is the capability to form a gel, an intricate network of protein strands that trap water, resulting in a firm structure. Another is to aid in dough formation to produce numerous bread products

Food Industry Uses Proteins from milk, meat, egg, and soy are used in a variety of gel. The gelling ability of proteins allows them to be used as binders, stabilizers, and thickeners in a variety of foods such as preserves, confectioneries (gums, marshmallows), and desserts (ice cream, puddings, custards, pie fillings, mousses, and gelatins). Sausages and gelled fish products also rely on the ability of proteins to gel.

**Denaturation/Coagulation:-** Large protein molecules are sensitive to their surroundings. When subjected to heat, pH extremes, alcohol, and physical or chemical disturbances, proteins undergo denaturation. Denaturation can result in coagulation, which is described as a curdling or congealing of the proteins. Both denaturation and coagulation are irreversible in most proteins. Protein are the “building blocks of life” and necessary for good health. Proteins are made of chains of up to 20 different amino acids. During digestion, proteins are broken down into amino acids for the body to use. Meats, poultry, fish, eggs, and dairy products contain complete proteins. Hydration the ability of proteins to dissolve in and attract water, a process called hydration, allows them to play several important roles in foods. One of these is the capability to form a gel, an intricate network of protein strands that trap water, resulting in a firm structure. Another is to aid in dough formation to produce numerous bread products

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**Enzymatic Reactions:-** Enzymes (or biocatalysts) are one of the most important proteins formed within living cells because they act as biological catalysts to speed up chemical reactions. Thousands of enzymes reside in a single cell, each one a catalyst that facilitates a specific chemical reaction.

Without enzymes, reactions would occur in a random and indiscriminate manner. The lock-and-key concept describes enzyme action. An enzyme combines with a substance, called a substrate. catalyzing or speeding up a reaction, which releases a product. The enzyme is freed unchanged after the reaction and is able to react with another substrate, yielding another product.

**Food Industry uses:-**Many foods would not be on the market if it were not for certain enzymes. Foods that can be manufactured with the aid of enzymes include wines, cheeses, corn syrups, yogurt, cottage cheese, baked goods, sausages, juices, egg white replacers, the artificial sweetener aspartame, and various Asian foods relying on molds like Rennin, also known as chymosin, aids in cheese production by converting milk to a curd.

- Meats can be tenderized with the enzymes of papain, bromelain, and/or fi cin.
- Phenol oxidase imparts the characteristic dark hue to tea, cocoa, coffee, and raisins.
- Glucose oxidase has been used for decades in the desugaring of eggs, flour, and potatoes, and in the preparation of salad dressings.
- Manufacturers of baked products use enzymes to retard staling, improve flour and dough quality, bleach flour, and enhance crust color.
- Enzymes can also be used in improving the filtration of bee

**Buffering and browning:** - Buffering Proteins have the unique ability to behave as buffers, compounds that resist extreme shifts in pH (Chemist's Corner 3-11). The buffering capacity of proteins is facilitated by their amphoteric nature.

Browning Proteins play a very important role in the browning of foods through two chemical reactions: the Maillard reaction and enzymatic browning.

- **Maillard reaction**

The reaction between a sugar (typically reducing sugars such as glucose/ dextrose, fructose, lactose, or maltose) and a protein (specifically the nitrogen in an amino acid), resulting in the formation of brown complexes.

#### **D. Vitamins**

Vitamins are present in foods in extremely small quantities, but they are essential for regulating body functions. Unlike proteins, fats, and carbohydrates, they supply no energy, but some of them must be present in order for energy to be utilized in the body.

Also, lack of certain vitamins causes *deficiency diseases*. Vitamins are classified as *water soluble* and *fat soluble*. The water-soluble vitamins (the B vitamins and vitamin C) are not stored in the body and must be eaten every day.

Foods containing these vitamins should be handled so the vitamins are not dissolved in to the cooking water and lost .Fat-soluble vitamins (A, D, E, and K) can be stored in the body, so they do not need to be eaten every day as long as the total amount eaten over time is sufficient. Consuming too much of a fat-soluble vitamin daily, as sometimes happens when people take too many vitamin supplements, can result in toxic levels of the vitamin stored in the tissues. Vitamins are organic compounds and vital nutrients that cannot be synthesized and thus must be obtained through the diet. Although vitamins are usually needed in minute amounts for normal physiological functions such as maintenance, growth, and development, insufficient intake of vitamins gives rise to specific deficiency syndromes reports have also found various health benefits of vitamins. In detail, ascorbic acid and  $\alpha$ -tocopherol have anti-aging and redox state regulation effects as powerful antioxidants  $\alpha$ -tocopherol and  $\beta$ -carotene could be synergistic antioxidants and may prevent several cancers and vitamin K intake is associated with reduced cardiovascular disease and vascular calcification.

#### **E. Minerals and vitamin**

Vitamins are present in foods in extremely small quantities, but they are essential for regulating body functions. Unlike proteins, fats, and carbohydrates, they supply no energy, but some of them must be present in order for energy to be utilized in the body. Also, lack of certain vitamins causes deficiency diseases

They cannot be synthesized by the body. Must be obtained by outside sources like diet, rumen of bacteria & sun.

- Vitamins also assist in the formation of hormones, blood vessels, nervous system chemicals and genetic materials
- They generally act as catalysts, combining with proteins to create metabolically active enzymes that are essential for life reactions
- Without enzymes, many of the reactions essential to life would slow down or cease.

Minerals, like vitamins, are consumed in very small quantities and are essential for regulating certain body processes,

Minerals that must be consumed in relatively large amounts—more than 100 milligrams daily—are called **major minerals**. These include Calcium, chloride, magnesium, phosphorus, sulfur, sodium, and potassium.

Minerals that must be present in smaller amounts are called **trace minerals**. These include chromium, copper, fluoride, iodine, iron, manganese, molybdenum, selenium, and zinc. Less is known about the functions of some of the trace minerals. It is important to understand, however, that although small quantities are needed by the body, too much of any of them can be harmful.

### Composition of vitamin

Vitamins are of different chemical nature. These are alcohols, aldehydes, organic acids, their derivatives and nucleotide derivatives

Unlike vitamins, minerals cannot be destroyed by heat, light, or oxygen. Vitamins and minerals do not provide calories

### 1. Enrichment and Fortification

Because of the vital role vitamins and minerals play in the body's processes, many foods are now enriched or fortified with additional vitamins and minerals.

During processing and preparation, foods such as wheat and rice may lose some of their vitamin or mineral content.

Some of the nutrients, such as vitamin B1 (thiamin), vitamin B2 (riboflavin), niacin, and iron (calcium optional), may be added back to the processed food (enrichment)<sup>2</sup> Certain nutrients, especially vitamins A, C, and E and the mineral selenium, may also be added to foods to act

### 2 .Antioxidants.

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- Enriched Foods that have had certain nutrients, which were lost through processing, added back to levels established by federal standards.
- Fortified Foods that have had nutrients added that were not present in the original food.
- Antioxidant A compound that inhibits oxidation, which can cause deterioration and rancidity. Free radical An unstable molecule that is extremely reactive and that can damage cells

### Charcterstic Vitamin

Vitamins are not synthesized by the body and must come from food. An exception are vitamin B<sub>3</sub> (PP), which active form NADH (NADPH) can be synthesized from tryptophan and vitamin D<sub>3</sub> (cholecalciferol), synthesized from 7- dehydrocholesterol in the skin

Amount of those ones and vitamins partially synthesized by intestinal microflora (B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, B<sub>5</sub>, B<sub>6</sub>, K, and others) is normally not sufficient to cover the body's need them of vitamin

Sodium, a component of table salt, is well known as a health problem. Too much sodium is thought to contribute to high blood pressure. Health authorities try to convince people to reduce the sodium in their diets, primarily by salting foods less.

### F. Water

The adult human body is 50 to 60 percent water by weight. Water plays a role in all the body's functions, including metabolism and other cell functions, digestion, delivery of nutrients, removal of waste, temperature regulation, and lubrication and cushioning of joints and tissues. Water forms a large part of most of the food we eat and all the beverages we drink.

The body is good at regulating its own water content and tells us when we need more by making us feel thirsty this signal should not be ignored. Even better is to drink enough fluids to *prevent* feeling thirsty .Required daily water intake varies greatly from person to person, depending on age, level of activity, and environmental factors such as heat. The common recommendation of 8 glasses of water a day is not enough for some people, such as athletes and others who exercise strenuously, and is too much for others, such as older, sedentary adults.

In nutrition, diet is the sum of food consumed by a person or other organism. The word diet often implies the use of specific intake of nutrition for health or weight management reasons (with the two often being related). Although humans are omnivores, each culture and each person holds

some food preferences or some food taboos. This may be due to personal tastes or ethical reasons. Individual dietary choices may be more or less healthy.

Complete nutrition requires ingestion and absorption of vitamins, minerals, essential amino acids from protein and essential fatty acids from fat-containing food, also food energy in the form of carbohydrate, protein, and fat. Dietary habits and choices play a significant role in the quality of life, health and longevity

## **1.2.Exploring Sources of information about nutrition and diet**

### **1.2.1. Eat a variety of different foods**

Variety in the diet means consuming all four of the basic food groups each day: staple foods (starches); vegetables and fruits; meat/animal products and legumes/nuts; and fats.

Twelve categories of a healthy food:-

- Cereals
- Roots and tubers
- Vegetables
- Fruit
- Egg
- Meat, poultry, organs (kidney and liver)
- Fish and seafood
- Pulses/legumes/nuts
- Milk and milk product
- Oil/fats
- Sugar and honey
- Others, such as condiments and spices

#### **a. Include carbohydrates in every meal by eating staple foods such as grains and roots.**

Carbohydrates are the largest proportion of foods we eat and provide most of the body's energy. Most carbohydrates come from staple foods such as cereals and tubers. They may be divided into two groups: starches and sugars. The effect on the body's energy level depends on the type of carbohydrate. Starches provide sustained energy over a longer period of time, while sugars give quick energy but can make you feel tired afterwards.

Eat proteins such as pulses, meat, fish or other animal products daily, where possible. Proteins provide the nutrients for building and maintaining the body. About 17 per cent of the body, including muscles, bones, skin, nails and hair, is made of protein. Proteins come from plant or animal sources. For growing children, proteins from animal sources are better than proteins from plants.

Foods that are rich in proteins are:

- Animal products, such as meat, eggs, fish and dairy.
- Pulses, such as beans, chickpeas/cowpeas and lentils, and green peas.
- Oil seeds, such as groundnut, sesame and sunflower.
- Cereals, especially unrefined, such as whole grains.

**b. Include fibers in the diet by eating fresh, unprocessed foods every day.**

Fibers are an essential part of the diet even though they do not provide any nutrients. Diets with sufficient fibers promote regular digestion which helps the body to remove waste products and increase use of nutrients. Fibers are found in the husks and skins of cereals and pulses.

All plant foods are useful sources of fibers, but the richest. Whole grains and foods made with whole grains.

- Pulses, such as dried beans, peas and lentils.
- Tubers and roots, such as beetroots and carrots.
- Fresh fruits, such as figs, oranges, plums, papayas, apples and mangos.
- Dried fruits, such as dates and raisins.
- Vegetables, such as spinach and cabbage.
- Nuts and seeds, such as sesame and sunflower.
- Fibers are particularly important in the adult diet but should be limited in the diet of young children as they can cause bloating of the stomach and reduce the body's capacity to absorb nutrients.
- Cereals and pulses given to young children should have the husks and the skins removed.

**a. Include only small amounts of fats (oil or butter) in the diet every day**

Fats are a prime source of energy and are stored by the body in special cells as concentrated sources of energy. Fats ensure the smooth functioning of the body in particular the nervous system.

Fats can be divided into two groups:

- **Saturated fats** are more solid at room temperature. They mostly come from animal sources such as butter and lard but can also come from plant Sources such as coconut oil and palm oil.
- **Unsaturated fats** are more liquid at room temperature. They mostly come from plant sources such as corn oil, sunflower oil, groundnut oil and olive oil.

Unsaturated fats are healthier than saturated fats. Natural sources of *good fats* are:

- Seeds, such as sunflower, pumpkin and sesame.
- Nuts, such as peanuts.
- Fruits, such as avocados and olives.
- Fatty fish.

Almost half (40 per cent) of a child's energy should come from fat sources. This is because they have small stomachs and can only consume little amounts of food at a time. By contrast, adults need only gain 17 per cent of their energy from fat sources. At least 70 per cent of adults' energy can come from carbohydrate Sources such as staple foods. Pregnant and breastfeeding women should get at least 20 per cent of their energy from fat sources.

**b. Include *vitamins and minerals* in the diet by eating plenty of vegetables and fruits every day and adding small amounts of iodized salt to every meal.**

Vitamins and minerals are needed by the body in small amounts to enable it to grow, develop and function. They do not supply energy but work with macronutrients such as carbohydrates, proteins and fats to produce energy.

Vitamins are vital for the body to function properly and to fight against and recover from diseases. While each vitamin has specific properties, their most important functions are to:

- boost the body's capacity to fight against and recover from diseases.
- improve the functioning of the nervous system (brain, nerves) and the digestive
- System (stomach, gut)
- prevent low birth weight

- support growth of the child
- Build and maintain strong vision and healthy skin, bones, teeth and muscles.

Minerals provide much of the body structure for bones and teeth and help the body fights against and recover from diseases. While each mineral has specific properties, their most important functions are to:

- promote children's growth and brain development
- boost the body's capacity to fight against and recover from diseases
- improve functioning of the nervous system and the digestive system
- build and maintain healthy bones, teeth and muscles (including the heart)
- Improve blood circulation and blood pressure.

To be most effective, vitamins and minerals need to work together. The main sources of vitamins and minerals are:

- fresh orange, yellow, red and green fruits, such as oranges, mangos, papayas, Bananas, pineapples, apples, strawberries, guavas, avocados, etc.
- Fresh green leafy vegetables such as spinach, broccoli, watercress, cabbage etc.
- fresh orange, yellow and red vegetables, such as carrots, pumpkins, peppers Tomatoes etc.
- Unrefined cereals, such as whole grains, millet, sorghum, oats, etc.
- Pulses, such as dried beans, peas and lentils, etc.
- fresh red meat and organ meat such as liver and kidney
- fresh fish and fish oil
- nuts and seeds

Iodized salt should be added to every meal because the body cannot store iodine for a long time. Iodine-rich natural sources include:

- milk
- egg yolks
- Fish from the sea and other seafood.

**C. ensures a healthy *balance* of all types of nutrients in the diet.**

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Too little or too much of each type of nutrient can be unhealthy. When too much carbohydrate is eaten, the body will not use it immediately. Instead it will be turned into fats and stored by the body. Processed carbohydrates, such as white bread, white rice and maize flour, lose important natural nutrients such as proteins, minerals and vitamins during the refining process.

If too much sugar is eaten, especially white processed sugar and sweetened foods and drinks, it will also be turned into body fat. It can also increase the risk of tooth decay and vitamin and mineral deficiencies, particularly in children.

It can also easily lead to being overweight. Too much protein in the adult's diet, especially from animal sources, can increase cholesterol levels and lead to a higher risk of heart disease and cancer.

Too little protein in a child's diet, especially from animal sources, can slow down growth. Too much of the "bad" fats in an adult's diet, especially animal fats, can increase cholesterol levels and lead to an increased risk of heart disease, overweight and cancer. To reduce the health risks associated with bad fats, it is important to:

- Keep use of animal fats, such as lard and butter, to a minimum.
- Use vegetable oils instead of margarine and other spreads.
- To reduce fat intake generally, use stir-frying with a little oil instead of deep frying in a lot of oil.

**d. Use *simple and careful cooking methods* to ensure maximum nutrients are obtained from foods.**

- **Vegetables**

Raw fruits and vegetables are the richest sources of vitamins and minerals. Fruits and raw carrots, tomatoes and cucumber make excellent snacks between meals. Raw vegetables can also be served as salads with meals. Herbs, such as parsley, mint, lemongrass, fennel and dill, and flavoring plants, such as ginger root and garlic cloves, are beneficial and may be added to salads and meals. Raw fruits and vegetables need to be cut or washed in safe water just before eating. The less vegetables are cooked, the more vitamins and minerals will be preserved. Vitamins and minerals can be damaged by:

- Soaking vegetables and fruits for too long in water.
- Cooking vegetables and fruits for too long and with too much water.
- Cooking green vegetables with bicarbonate of soda.
- Cutting leafy vegetables with a knife instead of ripping the leaves into pieces.

The best way of cooking vegetables is by steaming them with a little water instead of boiling them. Leaves from vegetables such as spinach can be steamed for about five minutes in a sieve over rapidly boiling water. Leaves will need to be stirred with a wooden spoon so that all of them are exposed to the steam. The boiled water from vegetables contains a lot of vitamins and minerals and can be added to a stew or used as a sauce, soup or drink.

- **Pulses**

Pulses include sugar beans, fava beans, chickpeas/cowpeas, pigeon peas, soya beans and lentils. Pulses can take a long time to cook and use a lot of fuel. They can also cause bloating and gas in the stomach. To reduce cooking time and gas effects, soak pulses overnight and skim off the foam produced during cooking with a spoon.

- **Meat, poultry and fish**

*Fresh* meat, poultry and fish contain more nutrients than products that have been processed and put in cans. All meat, poultry and fish should be thoroughly cooked. Salmonella is an infection which can be transmitted through undercooked foods (most often chicken or raw or lightly cooked eggs with runny whites/yolks). Children, older persons and sick people are at highest risk of salmonella. The risk of food poisoning is also high with undercooked meat, poultry or fish. Food grilled or roasted over fire or charcoal may burn on the outside and remain undercooked on the inside, which can

cause food poisoning. Especially when grilled, meat and poultry should be checked to ensure it is well cooked through. Fish and seafood can be grilled or steamed lightly in as little water as possible until thoroughly cooked. It is advisable to cut off the fat from all types of meat because fat can contain chemicals and pesticides that the animal has absorbed through grazing.

### **1.3. Identifying food additives and preservatives**

#### **1.3.1. Food additives**

**Food additives** are substances that are added to food to maintain or improve the safety, freshness, taste, texture, or appearances of food are known as food additives. Some food additives have been in use for centuries for preservation – such as salt (in meats such as bacon or dried fish), sugar (in marmalade), or sulfur dioxide (in wine).

**Preservatives food** are a chemical substances that are added to the food help prevent spoiling improve appearance and maintain food nutritional content.

- Many different food additives have been developed over time to meet the needs of food production, as making food on a large scale is very different from making them on a small scale at home. Additives are needed to ensure processed food remains safe and in good condition throughout its journey from factories or industrial kitchens, during transportation to warehouses and shops, and finally to consumers.
- The use of food additives is only justified when their use has a technological need, does not mislead consumers, and serves a well-defined technological function, such as to preserve the nutritional quality of the food or enhance the stability of the food.
- Food additives can be derived from plants, animals, or minerals or they can be synthetic. They are added intentionally to food to perform certain technological purposes which consumers often take for granted. There are several thousand food additives used, all of which are designed to do a specific job in making food safer or more appealing.

WHO, together with FAO, groups food additives into 3 broad categories based on their function.

**Flavouring agents:** - which are added to food to improve aroma or taste – make up the greatest number of additives used in foods. There are hundreds of varieties of flavorings used in a wide variety of foods, from confectionery and soft drinks to cereal, cake, and yoghurt. Natural flavoring agents include nut, fruit and spice blends, as well as those derived from vegetables and wine. In addition, there are flavorings that imitate natural flavours.

**Enzyme preparations:** - are types of additive that may or may not end up in the final food product. Enzymes are naturally-occurring proteins that boost biochemical reactions by breaking down larger molecules into their smaller building blocks. They can be obtained by extraction from plants or animal products or from micro-organisms such as bacteria and are used as alternatives to chemical-based technology. They are mainly used in baking (to improve the dough), for manufacturing fruit juices (to increase yields), in wine making and brewing (to improve fermentation), as well as in cheese manufacturing (to improve curd formation).

**Other food additives:-** are used for a variety of reasons, such as preservation, colouring, and sweetening. They are added when food is prepared, packaged, transported, or stored, and they eventually become a component of the food.



Preservatives can slow decomposition caused by mold, air, bacteria, or yeast. In addition to maintaining the quality of the food, preservatives help control contamination that can cause foodborne illness, including life-threatening botulism. Coloring is added to food to replace colors lost during preparation, or to make food look more attractive.

Non-sugar sweeteners are often used as an alternative to sugar because they contribute fewer or no calories when added to food. Additives are substances added to food to maintain or improve its safety, freshness, taste, texture, or appearance.

Food additives need to be checked for potential harmful effects on human health before they can be used. Food additives are natural or synthetic substances that can be added to foodstuff in small amounts to perform technological functions, namely color, sweetness or to extend shelf life.

### 1.3.2. Identifying Food Additives

Food Additives are used to improve food. They can:

- Improve the keeping quality of a food by making it last longer on the shelf or in the fridge, for example a preservative to prevent the growth of bacteria or a humectant to stop food from drying out.
- Improve the taste or appearance of a food, for example by the use of flavors, thickeners and colors. Another benefit of food additives is that consumers can be offered a wider choice of foods. Many processed foods contain additives. Some common examples are bacon, margarine, ice cream and bread.

More specifically, the values, ideas, assumptions, and ways knowing that underlie hegemonic nutrition frame healthy eating as something that is best understood as a bio physiological concern, and is therefore most accurately described using science and quantitative measure. That is, the dominant paradigm understands healthy eating through an approach to knowledge known as a positivist epistemology. When viewed through this lens, the criteria used to define healthy eating focus almost exclusively on the quantifiable nutrients contained in single food items, which are determined through scientific analysis

### 1.3.3. Uses of additives

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Some of the main functions of additives are to:

- Improve the color, taste, appearance, and texture of food
- Stop food from spoiling, drying out, or going rancid – these food additives are called antioxidants
- Keep food moist – these food additives are called humectants.
- Sometimes, nutrients are added to increase the health benefits of food

#### 1.4.Nutritional guidelines for healthiness

##### Key Facts :-

- A healthy diet helps protect against malnutrition in all its forms, as well as non-communicable diseases (NCDs), including diabetes, heart disease, stroke and cancer.
- Unhealthy diet and lack of physical activity are leading global risks to health.
- Healthy dietary practices start early in life – breastfeeding fosters healthy growth and improves cognitive development, and may have longer-term health benefits, like reducing the risk of becoming overweight or obese and developing NCDs later in life.
- Energy intake (calories) should be in balance with energy expenditure. Evidence indicates that total fat should not exceed 30% of total energy intake to avoid unhealthy weight gain (1, 2, 3), with a shift in fat consumption away from saturated fats to unsaturated fats (3), and towards the elimination of industrial trans fats (4).
- Limiting intake of free sugars to less than 10% of total energy intake (2, 5) is part of a healthy diet. A further reduction to less than 5% of total energy intake is suggested for additional health benefits (5).
- Keeping salt intake to less than 5 g per day helps prevent hypertension and reduces the risk of heart disease and stroke in the adult population (6).

##### Overview

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Consuming a healthy diet throughout the life course helps prevent malnutrition in all its forms as well as a range of non-communicable diseases and conditions. But the increased production of processed food, rapid urbanization and changing lifestyles has led to a shift in dietary patterns. People are now consuming more foods high in energy, fats, free sugars or salt/sodium, and many do not eat.

#### 1.4.1. For Adults

##### A healthy diet contains:

- Fruits, vegetables, legumes (e.g. lentils, beans), nuts and whole grains (e.g. unprocessed maize, millet, oats, wheat, brown rice).
- At least 400 g (5 portions) of fruits and vegetables a day (2). Potatoes, sweet potatoes, cassava and other starchy roots are not classified as fruits or vegetables.
- Less than 10% of total energy intake from free sugars (2, 5) which is equivalent to 50 g (or around 12 level teaspoons) for a person of healthy body weight consuming approximately 2000 calories per day, but ideally less than 5% of total energy intake for additional health benefits (5). Most free sugars are added to foods or drinks by the manufacturer, cook or consumer, and can also be found in sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates.
- Less than 30% of total energy intake from fats (1, 2, 3). Unsaturated fats (e.g. found in fish, avocado, nuts, sunflower, canola and olive oils) are preferable to saturated fats (e.g. found in fatty meat, butter, palm and coconut oil, cream, cheese, ghee and lard) (3). Industrial trans fats (found in processed food, fast food, snack food, fried food, frozen pizza, pies, cookies, margarines and spreads) are not part of a healthy diet.
- Less than 5 g of salt (equivalent to approximately 1 teaspoon) per day (6) and use iodized salt.

#### 1.4.2. For Infants and Young Children

In the first 2 years of a child's life, optimal nutrition fosters healthy growth and improves cognitive development. It also reduces the risk of becoming overweight or obese and developing NCDs later in life. Advice on a healthy diet for infants and children is similar to that for adults, but the following elements are also important.

- Infants should be breastfed exclusively during the first 6 months of life.
- Infants should be breastfed continuously until 2 years of age and beyond.
- From 6 months of age, breast milk should be complemented with a variety of adequate, safe and nutrient dense complementary foods. Salt and sugars should not be added to complementary foods.

### 1.4.3. Understanding effect of various cooking method on nutrients

The loss of nutrients increases with longer cooking times and higher temperatures.” The cooking methods you choose are important for the texture and flavor of your foods but also affect the nutritional value.

However, whilst several studies have focused on how cooking changes the nutritional components and phytochemical content of vegetables, few have investigated the true retention of vitamins following exposure to different cooking methods

- Provides proper structure to the blood vessels, bones and ligaments.
- They also help in maintaining the homeostasis of the body.

“How you cook your meals can have a big impact on their nutritional content,” In Ethiopia, a registered dietitian, says. “Many vitamins and minerals in food are sensitive to heat, water, light and air exposure

Additionally, cooking or heat treatments can have a significant impact on the content of vitamins, and lead to an inaccurate estimation of nutrient intake. Therefore, it is necessary to establish nutritional information on the retention of vitamins from vegetables by the different processing methods. The true retention is an important component defining the ultimate importance of vitamins in the consumed vegetables.



Figure1.1 different cooking method affects nutrients

## Different cooking method affects nutrients

### Some Like It Hot

Not all cooking methods have the same effects on all foods, and since we take sensory pleasure in eating, it's important to consider what cooking does to flavor and texture. On the other hand, heat can damage certain vitamins in some food. It's a fine balance.

#### A. Roasting

Involves cooking your food in the oven, with or without added fat, at a temperature between 285 and 400 degrees. Roasting is often used with meats, fish, vegetables and eggs. Roasting damages vitamin C and most B-complex vitamins because of the heat, and vitamins A and E may also be destroyed if extra fat is added.

“Roasting is slightly less ideal for vegetables since the prolonged exposure to high heat can increase nutrient loss,” Hanson says. “If you like the taste of roasted vegetables, stick with hardier options that are more resistant to heat like beets, onions, potatoes, celery and green beans.”

#### B. Sautéing

Is a dry-heat method that usually requires a small amount of fat to keep food from sticking to the pan. It's often used for vegetables and some types of tender or marinated meats. Very little fat is necessary, and the cooking time is shorter, so fewer nutrients are lost.

### C. Grilling or Broiling

Involves cooking over charcoal, flames or heating elements with or without added fats. Heat-sensitive vitamins are lost but some fat is also lost as it drains out.

### D. Baking

- Damages vitamin C and many of the B-complex vitamins, but what really makes or breaks baking as a healthy cooking method are the ingredients in your product.
- “Baking meat, poultry and fish is a great way to preserve the proteins and other nutrients in these foods. One plus in baking is that it makes grains a little easier to digest, but it can also cause the formation of acrylamides in grains and potatoes,” Hanson says.
- According to the FDA, acrylamide is a chemical that can form in some foods during high-temperature cooking. Remember, everything in moderation.

### E. Microwave Ovens

Often used to reheat leftovers, but they're also a good way to cook some vegetables. The microwave can be one of the best ways to retain vitamins and nutrients in vegetables.

“As a general rule, the best way to prevent nutrient loss is to cook vegetables quickly, with minimum heat and minimum liquid, and the microwave can accomplish this,” Hanson says.

## COOKING WITH LIQUID

### A. Boiling

Involves cooking food in hot water, broth, stock or other liquid. The effect of boiling on nutritional content varies depending on how long the foods are boiled.

Veggies lose a lot of their vitamin C and B-complex vitamins, but the availability of some carotenoids may increase, at least in some vegetables,” Hanson says. “Some nutrients are leached into the water, however.”

## B. Blanching

Is when you plunge food into boiling water for a short time? It is often the first step to preserving foods because it stops enzymes and helps veggies keep their bright colors. The nutrient loss is minimal because the cooking time is short. Blanching is one of the best ways to cook your vegetables because it's quick and requires minimal heat and water.

## C. Steaming

Also uses liquid but the heat from the steam does the cooking. This method maintains water soluble vitamins like folate, thiamine, riboflavin, niacin and more.

“Of all the cooking methods involving liquid, steaming appears to be best for nutrient retention,” Hanson says. “The hot steam cooks your food gently, which means valuable vitamins and minerals are preserved. You also don’t have to use fats or oils, which creates a healthier meal.”

## FRYING WITH FAT

### A. Deep-Frying

It is definitely a delicious cooking method. Since you’re fully submerging your food in hot oil, there’s no question frying increases the calorie count and fat content. That said, it doesn’t cause as much nutrient loss as boiling since the food cooks quickly.

### B. Stir-Frying

Uses a small amount of oil at a high temperature. “Not much nutritional content is lost because of the high temperature,” Hanson says. “And since only a small amount of oil is used, stir-fried dishes can be both nutritious and low in calories.”

The objectives of this study were to investigate the effect of different cooking methods including blanching, boiling, microwaving, and steaming, on the content and true retention of vitamins (i.e.  $\beta$ -carotene, ascorbic acid and vitamins E and K) in vegetables. In addition, analytical method

validation parameters such as accuracy and precision were determined to ensure the validity of vitamin analysis.

### **Functions of Nutrients for cooking**

The important functions of nutrients include:

- They are the main source of energy for the body.
- They help in building and repairing body tissues.
- Increases the absorption of fat-soluble vitamins.
- Helps in the synthesis of collagen.



Self-Check -1

Written Test\_1

Name.....Id.....Time Allowed.....

**Part1: Say the following questions**

1. The loss of nutrients increases with longer cooking times and higher temperatures
2. Other food additives are used for a variety of reasons, such as preservation, coloring, and sweetening
3. Enzyme preparations are a type of additive that may or may not end up in the final food product.

**Part2: Fill the blank space. (Each 4 point).**

- 1..... are added to food to improve aroma or taste – make up the greatest number of additives used in foods
- 2..... are present in foods in extremely small quantities, but they are essential for regulating body functions

**Part3: choose the best answer**

1. Which one about true vitamins and minerals can be damaged by?
  - A.Soaking vegetables and fruits for too long in water.
  - B.cooking vegetables and fruits for too long and with too much water.
  - C.Cooking green vegetables with bicarbonate of soda
  - D.all.
2. Which ONE is correct about important functions of nutrients?
  - a.They are the main source of energy for the body.
  - b.They help in building and repairing body tissues.
  - C.Decreases the absorption of fat-soluble vitamins.
  - D.all expect C.

**Part2: Write the following question**

1. Mention six categories of nutrient?
2. Define nutrient?
3. Define die?
4. List the compound of carbohydrate?

## Unit **Two**: Balanced Diet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Identifying nutrient found in different food items
- Promoting nutrition and healthy diet based on dietary guidelines
- Determining causes of nutrient loss during food preparation
- Acquiring amount of calorie requirement according to customer age ;sex and work habit

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Identify the nutrient found in different food items
- Promote nutrition and healthy diets based on dietary guidelines
- Determine causes of nutrient loss during food preparation
- Acquire amount of calories requirement according to customer age ;sex and work habit

## 2.1. Identifying nutrient found in different food items

These 10 nutritionists' favorites are versatile and delicious, and most can be prepared in a flash.

### A. Beans

Calypso, scarlet, black turtle, cranberry even the variety names of this delicious food are pretty cool.

They're such a nutrient dynamo that beans are the only food recognized in two food groups, vegetables and proteins, says Connie Evers, RD, author of *How to Teach Nutrition to Kids*.

Beans are high in low-fat protein, packed with fiber, and contain a host of nutrients and phytonutrients, the combination of which may help guard against diabetes, cardiovascular disease, and some cancers while also building and repairing muscle.

Add beans to soups, stews, and chili. Sprinkle them in salads, and add them to burritos or scrambled eggs. Or try blending beans with spices for great spreads or dips.

### B. Greek Yogurt

Smooth, creamy, and extra-thick, Greek yogurt is a great source of protein, potassium, and calcium and is also an important source of probiotics.

The nutrients in yogurt help build strong bones, aid digestion, and keep your immune system going strong. Along with having less watery whey than regular yogurt which helps make the Greek variety super-thick Greek yogurt also has less sodium and fewer carbs than regular yogurt and packs twice the protein.

Use plain nonfat Greek yogurt as a base for salad dressings, dips, and smoothies, suggests Evers, or try topping soups, stews, nachos, or chili with it. If you like your yogurt sweet, add a teaspoon of jam and sprinkle in some nuts or seeds and you've got a quick, healthy on-the-go breakfast.

### C. Sweet Potatoes

One of the most nutritious vegetables you can eat especially if you leave the skins on sweet potatoes are rich in heart-healthy potassium and vision-boosting vitamin A. Fat- and cholesterol free, sweet potatoes also have a rich, sugary flavor while still being low in calories.

Cubed sweet potatoes cook up quickly in the microwave, or you can toss them with a bit of oil and seasonings and roast them in the oven. Sweet potatoes can also give body to stews and a sweet flavor to lasagnas and other casseroles.

#### **D. Powerhouse Peanuts**

Like other legumes, peanuts are packed with the protein your body needs to build and repair muscle. They also contain mono- and polyunsaturated fats, important for heart health. The nutrients in peanuts possibly may lower your risk for cardiovascular disease, type 2 diabetes, and metabolic syndrome.

#### **E. Kefir**

Kefir is a fermented drink usually made with cow, goat, or sheep's milk, though it can also be made from rice, coconut, or soy milk.

Described by some as a mildly carbonated liquid yogurt, kefir is rich in calcium and protein and is also "a good source of magnesium, riboflavin, folate, and B12," says Grotto. Like yogurt, kefir contains probiotics, which not only aid digestion but may also help manage symptoms of IBS or Crohn's disease.

These probiotics may also treat or prevent vaginal or urinary infections in women. Kefir can be a nutritious, drinkable breakfast or quick, filling snack, but you can also blend it in smoothies and shakes or add it to soups, breads, and other baked goods.

#### **F. Vitamin-C Rich Strawberries**

Strawberries may be the favorite fruit of summer. More than just juicy and sweet, strawberries also pack 160% of your daily vitamin C inside that succulent scarlet skin.

Strawberries are a great source for digestion-boosting fiber, for vitamin C, which helps keep teeth and gums in good condition, and for flavonoids, which may improve mental function and fight breast and prostate cancer.

Fresh or frozen, strawberries "are a nutrition powerhouse," Grotto says, so add them to a summer salad, make a succulent fruit salsa, or drizzle ripe, ruby-red strawberries with a bit of dark chocolate for a healthier alternative to cake.

#### **G. Mushrooms**

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Mushrooms don't just add flavor to a stir-fry; they're also low in calories and an excellent source of the cancer-fighting mineral, selenium.

Additionally, these humble plants are the highest vegetarian source of vitamin D and they're high in copper and potassium, nutrients needed for normal heart rhythm, nerve function, and red blood cell production.

Mushrooms cook in a flash and pair equally well with vegetarian, vegan, or meaty meals. Slice them onto sandwiches or into salads, or put them in any recipe that could use a more toothsome texture.

## H. Pineapple

"I love pineapple!" says Elisa Zied, RD, author of *Nutrition at Your Fingertips*. A great source of vitamin C, this super-sweet fruit is also rich in minerals, fiber, B vitamins, and enzymes. The nutrients found in pineapple and so many other fruits and veggies may lower blood pressure, protect against cancer, and help keep bowel habits regular. Enjoy fresh or canned pineapple paired with other fruits in a salad or a quick smoothie. Top chicken or fish with pineapple, or use it in cakes, pies, and tarts.

## I. Pistachio Nuts

Pistachios aren't just delicious. They also contain good-for-you fats, vitamins like thiamin, B6, and E as well as potassium, magnesium, and fiber one nutrient many of us just don't get enough of. These tasty nuts also provide antioxidants, which help fight cell-damaging free radicals, and some research suggests they may even play a role in reducing the risk of type 2 diabetes and heart disease.

Add pistachios to stir-fries, salads, or cooked vegetables or as part of a trail mix with whole-grain cereal and dried fruit, suggests Zied. You can even substitute pistachios for pine nuts or walnuts in your next homemade pesto.

## J. Sunflower Seeds

Sunflower seeds are small, but they're mighty. They contain healthy monounsaturated and polyunsaturated fats, which may lower your cardiovascular risks and lower blood pressure, and have protein and fiber, both of which help fill you up, says Zied.

Sunflower seeds are a source of key nutrients like vitamin E, folate, thiamin, niacin, and iron and also pack in phytochemicals, plant chemicals that protect against heart disease and some cancers.

Try raw or salt-free roasted sunflower seeds on their own or in salads, stir-fries, or side dishes. You can also boost the nutrient profile of breads and muffins by adding a healthy handful.

## K. Crunchy Snack: Popcorn

It's crunchy and a bit addictive, but popcorn can be good for you. That's because popcorn is actually a whole grain and most of us aren't getting nearly enough in our diets, says Zied. Air-popped popcorn is low-fat, has only 30 calories per cup, and comes with a boost of fiber, protein, vitamins, and minerals. It even contains antioxidants that can protect against cancer.

Amp up the flavor of air-popped popcorn by sprinkling on low- or no-sodium seasonings like garlic or onion powder, grated parmesan cheese, chili powder, nutritional yeast, or cinnamon.

Plants as a food source are often divided into:

- Seeds
- fruits,
- vegetables,
- legumes,
- Grains and nuts.

Where plants fall within these categories can vary with botanically described fruits such as the tomato, squash, pepper and eggplant or seeds like peas commonly considered vegetables

Food is a fruit if the part eaten is derived from the reproductive tissue, so seeds, nuts and grains are technically fruit.



Figure2.1 foods from plant sources

From a culinary perspective fruits are generally considered the remains of botanically described fruits after grains, nuts, seeds and fruits used as vegetables are removed.

Grains can be defined as seeds that humans eat or harvest, with cereal grains (oats, wheat, rice, corn, barley, rye, sorghum and millet) belonging to the Poaceae (grass) family and pulses coming from the Fabaceae (legume) family. Whole are foods that contain all the elements of the original seed (bran, germ, and endosperm) Nuts are dry fruits distinguishable by their woody shell.

## 2.2. Promoting nutrition and healthy diet based on dietary guideline

### 2.2.1. The Guidelines dietary

#### 1. Follow a healthy dietary pattern at every life stage.

At every life stage—infancy, toddlerhood, childhood, adolescence, adulthood, pregnancy, lactation, and older adulthood—it is never too early or too late to eat healthfully.

**For about the first 6 months of life**, exclusively feed infants human milk. Continue to feed infants human milk through at least the first year of life, and longer if desired. Feed infants iron-fortified infant formula during the first year of life when human milk is unavailable. Provide infants with supplemental vitamin D beginning soon after birth.

**At about 6 months**, introduce infants to nutrient-dense complementary foods. Introduce infants to potentially allergenic foods along with other complementary foods. Encourage infants and toddlers to consume a variety of foods from all food groups. Include foods rich in iron and zinc, particularly for infants fed human milk.

**From 12 months through older adulthood**, follow a healthy dietary pattern across the lifespan to meet nutrient needs, help achieve a healthy body weight, and reduce the risk of chronic disease.

#### 2. Customize and enjoy nutrient-dense food and beverage choices to reflect personal preferences, cultural traditions, and budgetary considerations.

A healthy dietary pattern can benefit all individuals regardless of age, race, or ethnicity, or current health status. The *Dietary Guidelines* provides a framework intended to be customized to individual needs and preferences, as well as the foodways of the diverse cultures in the United States.

#### 3. Focus on meeting food group needs with nutrient-dense foods and beverages, and stay within calorie limits.



An underlying premise of the *Dietary Guidelines* is that nutritional needs should be met primarily from foods and beverages specifically, nutrient-dense foods and beverages. Nutrient-dense foods provide vitamins, minerals, and other health-promoting components and have no or little added sugars, saturated fat, and sodium. A healthy dietary pattern consists of nutrient-dense forms of foods and beverages across all food groups, in recommended amounts, and within calorie limits.

The core elements that make up a healthy dietary pattern include:

**Vegetables of all types** dark green; red and orange; beans, peas, and lentils; starchy; and other vegetables

**Fruits**, especially whole fruit.

**Grains**, at least half of which are whole grain .

**Dairy**, including fat-free or low-fat milk, yogurt, and cheese, and/or lactose-free versions and fortified soy beverages and yogurt as alternatives.

**Protein foods**:- including lean meats, poultry, and eggs; seafood; beans, peas, and lentils; and nuts, seeds, and soy produce.

#### **4. Limit foods and beverages higher in added sugars, saturated fat, and sodium, and limit alcoholic beverages.**

At every life stage, meeting food group recommendations—even with nutrient-dense choices—requires most of a person’s daily calorie needs and sodium limits. A healthy dietary pattern doesn’t have much room for extra added sugars, saturated fat, or sodium—or for alcoholic beverages. A small amount of added sugars, saturated fat, or sodium can be added to nutrient-dense foods and beverages to help meet food group recommendations, but foods and beverages high in these components should be limited. Limits are:

- **Added sugars**—Less than 10 percent of calories per day starting at age 2. Avoid foods and beverages with added sugars for those younger than age 2.
- **Saturated fat**—Less than 10 percent of calories per day starting at age 2.
- **Sodium**—Less than 2,300 milligrams per day—and even less for children younger than age 14.
- **Alcoholic beverages**—Adults of legal drinking age can choose not to drink, or to drink in moderation by limiting intake to 2 drinks or less in a day for men and 1 drink or less in a day for women, when alcohol is consumed. Drinking less is



better for health than drinking more. There are some adults who should not drink alcohol, such as women who are pregnant.

### 2.2.2. Good Nutrition for Human Healthy

Good nutrition means your body gets all the nutrients, vitamins, and minerals it needs to work its best. Plan your meals and snacks to include nutrient-dense foods that are also low in calories

Nutrients are the compounds in food that provide us with energy that facilitates repair and growth and helps to carry out different life processes.”

Not all nutrients provide energy but are necessary for some form or the other. These nutrients are divided into two categories:

Macronutrients, which are required by the body in large amounts.

- Amount of calorie requirement according to customer age; sex and work habit
- Micronutrients are which are required by the body in small amounts.



Figure 2.2 variety composition good nutrition

## Good nutrition and the role

### L. Weight management

A lot of us mistakenly associate weight-loss with fad diets, but eating a nutritious diet is really the best way to go about maintaining a healthy weight and at the same time attaining the necessary nutrients for healthy body function. Swapping unhealthy junk food and snacks out for nutritious food is the first step to keeping your weight within a healthy range relative to your body composition, without the need to jump on the fad-diet bandwagon.

#### • Protecting you from chronic diseases

Many chronic diseases such as type-2 diabetes and heart disease are caused by poor nutrition and obesity. With 1 in 9 Singaporeans suffering from diabetes, the emphasis on good nutrition is higher than ever. Taking a preventive approach with a whole food-based nutrition plan also reduces the risk of developing other related diseases such as kidney failure.

#### • Strengthening your immune system

Our immune system requires essential vitamins and minerals in order to function optimally. Eating a wholesome and varied diet ensures your immune system functions at peak performance and guards against illnesses and immunodeficiency problems.

#### • Delaying the onset of ageing

Certain types of food such as tomatoes and berries can increase vigour and improve cognitive performance, all the while protecting your body against the effects of ageing.

#### • Supporting your mental well-being

Eating the right foods can actually make you happier – nutrients such as iron and omega-3 fatty acids found in protein-rich food can boost your mood. This contributes to better overall mental well-being and protects you against mental health issues.

So, how does one build a sensible nutrition plan then? Healthy eating is all about eating balanced proportions of nutrient-rich foods from the various food groups, as well as adopting several healthy eating habits.

### M. Body composition

A well-structured nutrition plan should allow an individual to maintain a healthy physique within acceptable body fat levels (18-24% for men and 25-31% for women). This also means that it

should support metabolic health through a number of means, such as promoting healthy hormone function, insulin sensitivity and physical recovery.

- **Healthy cholesterol levels and blood pressure**

Monitoring your cholesterol levels and blood pressure is crucial because having a healthy weight doesn't discount the possibility of issues in these areas. While dietary cholesterol doesn't have as much effect on blood cholesterol levels as we once thought, it can still be influenced by your overall dietary fat intake. On the other end, excessive sodium intake can lead to hyper-extension, of which one of the symptoms happens to be elevated blood pressure levels.

- **Healthy skin and hair**

The condition of your skin and hair are good indicators of the quality of your nutrition. If you are getting enough nutrients, your skin should be firm, supple and of a rich hue rather than flaking and pale. Your hair should be smooth and strong rather than dry and brittle; unexplained hair loss is often a sign of malnutrition.

- **Sleep and energy levels**

Getting the right amount of nutrients and calories will help you stay energized due to its ability to promote restful sleep. If you find yourself feeling sluggish, It could be a sign of either a distinct lack of calories and/or nutrients, driving your body into “starvation mode” which hampers its restorative capabilities.

- **Regular bowel movements**

Your bowel movements reflect whether you are getting sufficient fiber from your diet, so if you find yourself being constipated, load up on more fruits and vegetables to get your digestive system going.

While these five indicators of a nutritious diet may give you're a decent idea on how to go about achieving your nutrition goals, there's no real need to go about it by your lonesome. Getting the help of a certified nutritionist can help improve your odds of success while avoiding the common

### **2.3.Determining causes of nutrient loss during food preparation**

Cause of nutrient loss during preparation is a processes affecting food nutrient contact. A variety of things can happen during the growing, harvesting, storage and preparing of food that can affect its nutritional contact. Processes that expose food to high levels of heat light or oxygen cause the greatest nutrient's loss.

### 2.3.1. Causes of nutrient loss during food preparation

#### *Nutrient losses and gains during food processing and preparation*

In the absence of analytical data for all forms of foods nutrient values can be estimated by calculation using standard algorithms that have been experimentally derived. Since the content of nutrients per unit mass of food changes when foods are prepared, such losses and gains can be classified in two ways.

**1. The described by a food yield factor**, when the weight of the primary ingredients at the precooking stage is compared with the weight of the prepared food at the cooking stage and also with the final weight of the food as consumed at the post-cooking stage. The weight of the food can be increased due to the hydration of the dry form of a food (e.g., rice, macaroni) with cooking liquid, (e.g., water or broth) or increased due to the absorption of fat during frying of the food (e.g., potato). Alternatively, the weight of the food can decrease due to dehydration during cooking as a result of evaporative and drip losses.

**2. The nutrient retention factor** is related to changes in the amount of specific nutrients when foods are prepared. Changes in the nutrient levels can occur due to partial destruction of the nutrient as a result of the application of heat, alkalization, etc. Also, for some dietary components (e.g.  $\beta$ -carotene) the amount of available component may increase due to the breakdown of cell walls in the plant-based sample. Although original analytical data would be the most desirable type of data for foods at all stages of preparation, they are seldom available. Efforts are in progress in several regions to revise the nutrient losses and gain factors, including nutrient retention and yield factors, in order to compare and harmonize them and thereby improve the quality of food composition data calculated.

As food composition data are frequently lacking for cooked foods, estimates based on the use of these factors for calculating the nutrient content of prepared foods from raw ingredients are made. Thus, the nutrient composition of a prepared or cooked food is calculated from the analytical data of uncooked food by applying suitable nutrient retention and yield factors. To obtain the nutrient content per 100 g of cooked food, the nutrient content per 100 g of raw food is

multiplied by the percentage retained after cooking, and this is divided by the percentage retained after cooking, divided by the percentage yield\* of the cooked product:

Nutrient content of cooked food per 100 g = [(nutrient content of raw food × retention factor)/yield of cooked food] × 100

The retention factor accounts for the loss of solids from foods that occur during preparation and cooking. The resulting values quantify the nutrient content retained in a food after nutrient losses due to heating or other food preparations.

## 2.4.Acquiring amount of calorie requirement according to customer age; sex and work habit

### What are calories?

The nutritional information on all food packaging will advise how many calories it contains. Most people only associate calories with food and drink, but anything that contains energy has calories. 1 kilogram (kg) of coal, for example, contains 7,000,000 calories.

There are two types of calorie:

**A. small calorie (cal)** is the amount of energy required to raise the temperature of 1 gram (g) of water by 1° Celsius (° C).

**B. large calorie (kcal)** is the amount of energy required to raise 1 kilogram (kg) of water by 1° It is also known as a kilocalorie. 1 kcal is equal to 1,000 cal. The terms “large calorie” and “small calorie” are often used interchangeably. This is misleading. The calorie content described on food labels refers to kilocalories. A 250-calorie chocolate bar actually contains 250,000 calories.

- **Daily requirement**

The United States government states that the average man needs 2,700 kcal per day and the average woman needs 2,200 kcal per day. Not everybody needs the same number of calories each day. People have different metabolisms that burn energy at different rates, and some people have more active lifestyles than others.

The recommended intake of calories per day depends on several factors, including:

- overall general health
- physical activity demands
- sex
- weight
- height
- body shape

#### 2.4.1. Calories and human healths

The human body needs calories to survive. Without energy, the cells in the body would die, the heart and lungs would stop, and the organs would not be able to carry out the basic processes needed for living. People absorb this energy from food and drink.

If people consumed only the number of calories needed every day, they would probably have healthy lives. Calorie consumption that is too low or too high will eventually lead to health problems. The number of calories in food tells us how much potential energy they contain. It is not only calories that are important, but also the substance from which the calories are taken.

Below are the calorific values of three main components of food:

- 1 g of carbohydrates contains 4 kcal
- 1 g of protein contains 4 kcal
- 1 g of fat contains 9 kcal

As an example, here is the breakdown of how a person would get calories from one cup of large eggs Trusted Source, weighing 243 g:

**Fat: 23.11 g**

23.11 g x 9 kcal = **207.99 kcal**

**Protein: 30.52 g**

30.52 x 4 kcal = **122.08 kcal**

**Carbohydrate: 1.75 g**

1.75 x 4 kcal = **7 kcal**



243 g of raw egg contains 347 kcal. 208 kcal comes from fat, 122 kcal is taken from protein, and carbohydrate provides 7 kcal. The time of day at which a person eats can shape how effectively their body uses calories.

### **Empty calories**

Empty calories are those that provide energy but very little nutritional value. The parts of food that provide empty calories contain virtually no dietary fiber, amino acids, antioxidants, dietary minerals, or vitamins. According to ChooseMyPlate.gov, a diet management tool from the USDA, empty calories come mainly from solid fats and added sugars.

- **Solid fats:** Although these exist naturally in many foods, they are often added during industrial food processing, as well as during the preparation of certain foods. Butter is an example of a solid fat.
- **Added sugars:** These are sweeteners that are added to foods and beverages during industrial processing. They are filled with calories. In the U.S., the most common types of added sugars are sucrose and high-fructose corn syrup.

Added sugars and solid fats are said to make foods and drinks more enjoyable. However, they also add many calories and are major contributors to obesity. Alcohol can also contribute empty calories to the diet. One normal serving of beer can add 153 kcal to a person's intake for the day. If beer is not your drink of choice, you can use this calorie calculator Trusted Source provided by the National Institute on Alcohol Abuse and Alcoholism to work out how many calories alcohol adds to your diet.

### **Sources of empty calories**

The following foods and drinks provide the largest amounts of empty calories:

#### **Solid fats and added sugars**

- ice cream
- donuts
- pastries
- cookies
- cakes

### **Solid fats**

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- ribs
- bacon
- hot dogs
- sausages
- cheese
- pizza

### **Added sugars**

- fruit drinks
- sports drinks
- energy drinks
- soda

### **Sugary drinks are the leading source of empty calories for people**

When most of us think of calories, we think of how fattening a food is. In dietary terms, calories are the amount of energy that a food provides. If we consistently take in more energy than we need, we will gain weight. If we take in too little energy, we will lose weight, fat, and eventually muscle mass.





**Self-Check -2**

**Written Test\_2**

Name.....Id.....Time Allowed.....

**Part1: Say true or false the following questions (Each 4 point)**

1. Added sugars and solid fats are said to make foods and drinks more enjoyable.
2. The nutrient retention factor is related to changes in the amount of specific nutrients when foods are prepared.
3. Empty calories are those that provide energy but very little nutritional value.
4. The nutrients found in pineapple and other fruits and veggies lower blood pressure, protect against cancer, and help keep bowel habits regular.
5. Micronutrients is which are required by the body in small amounts

**Part2: choose the best answer the following question**

1. One is the amount of energy required to raise 1 kilogram (kg) of water by 1° It is also known as a kilocalorie?
  - A.small calories
  - B.large calories
  - C.empty calories
  - D.none
1. One is not recommended intake of calories per day depends on several factors?
  - A .overall general health
  - B .physical activity demands
  - C .sex
  - D.Weight
  - E .all
2. Plants as a food source but one not:
  - A.Seeds
  - B.fruits,
  - C.Energy
  - D legumes,

**Part3: Fill the blank space. (Each 4 point)**

1..... is the amount of energy required to raise the temperature of 1 gram (g) of water by 1° Celsius (° C).

2.....defined as seeds that humans eat or harvest, with cereal grains (oats, wheat, rice, corn, barley, rye, sorghum and millet) belonging to the Poaceae (grass) family and pulses coming from the Fabaceae (legume) family.

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Indicators of a nutritious diet

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