

Code and Title of the Paper: F01FS Food Science

Code and title of the Module: F01FS01 Food Groups

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Quadrant - I

Objectives

After going through this module, you will be able to

- Learn about the importance of foods and food groups in daily life
- Compare the different food groups
- Apply the concept in planning menus

1. Introduction

1.1 Importance of Food

Food is a basic necessity of man and is the essence of his life. More than clothing and shelter, food is the basic need of a human being. According to the Biblical Scriptures, God created plants and animals even before He created man and gave him all powers to own it. Thus, we could understand the importance of food that was established from the creation of the world.

Pre-historic man cultivated crops and hunted animals to satisfy his hunger. More than that, he discovered fire not only to drive away wild animals but also to cook foods so as to make it more palatable. Apart from the cultivated crops, man also ate fruits and vegetables that were already available in nature. He also reared poultry and cattle to satisfy his needs for milk and meat.

Thus, we could understand human beings desired to consume a variety of foods from ancient times. With the advent of varied cultures and traditions, foods were categorized and grouped as per the needs of the population.

1.2 Constituents of Foods

Food is a mixture of different nutrients such as carbohydrate, protein, fat, vitamins and minerals. These nutrients are essential for growth, development and maintenance of good health throughout life.

Carbohydrates make up the bulk of our diet. **Proteins** are the major source of building material for the body. **Vitamins** are “**accessory nutrients**”. **Minerals** are act as catalysts for many biological reactions within the body. **Water** is an ideal medium for transporting dissolved nutrients and wastes throughout the body.

2. Food Groups

2.1 What is a Food group?

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A food group is a collection of foods that share similar nutritional properties or biological classifications. Using food groups, we classify foods according to the nutrients they provide, plan daily menus of an individual, and develop a balanced diet.

Food groups are further classified into different basic food groups worldwide.

3. Basic Food groups

According to US Department of Agriculture, food groups are classified from 4 – 11 basic food groups. Though all the basic food groups are not followed currently, we need to know about each food group to widen our knowledge.

3.1 Basic Four Food groups

"Basic Four" food groups were recommended from 1956 until 1992 by the United States Department of Agriculture.

The basic four food group included the following foods

- 1. Vegetables and fruits:** Recommended as excellent sources of vitamins C and A and a good source of fiber. A dark-green or deep-yellow vegetable or fruit was recommended every other day .
- 2. Milk:** A good source of calcium, phosphorus, protein, riboflavin, and sometimes vitamins A and D. Cheese, ice cream, and ice milk could sometimes replace milk.
- 3. Meat:** Protein, iron and certain B vitamins were the nutrients present and the foods included meat, poultry, fish, eggs, dry beans, dry peas, and peanut butter.
- 4. Cereals and breads:** Whole grain and enriched breads were especially recommended as good sources of iron, B vitamins and carbohydrates, as well as sources of protein and fiber. Foods included cereals, breads, cornmeal, macaroni, noodles, rice and spaghetti.

3.2 Basic Five Food Group

The five main food groups are a central component of the dietary recommendations set forth by the U.S. Department of Agriculture. Food group guidelines were introduced in 1916, for the daily intake of calories and essential nutrients. The basic five food group includes the following foods

3.2.1 Fruits

The fruit food group encompasses a wide range of fresh fruits and fruit products, including dried, frozen and canned fruit and fruit juice. Berries and melons, which tend to be particularly nutrient-dense, are highlighted as important subgroups of the fruit group. While the USDA generally recommends filling half of each mealtime plate with fruits and vegetables, the amount of fruit a

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person should consume each day depends on their age, gender and activity level. Moderately-active men of any age and moderately-active women through the age of 30 should get 2 cups of fruit per day, while moderately-active women past the age of 30 require 1/2 cup less.

3.2.2 Vegetables

The vegetable food group includes an array of fresh vegetables and vegetable products, including frozen, canned and dried vegetables, as well as vegetable juice. The main group is divided into subgroups comprised of nutritionally similar foods, including dark green vegetables, red and orange vegetables, starchy vegetables, other vegetables and beans and peas. The purpose of these subgroups is to promote eating a wide variety of vegetables.

3.2.3 Grains

The grain food group is comprised of two subgroups: whole grains and refined grains. Whole grains and their products, including brown rice, quinoa, oats, muesli and whole-wheat pasta, tend to be significantly higher in fiber and protein than refined grain products, such as crackers, corn flakes, grits and traditional pasta. Most refined grains have been enriched, however, and are high in B vitamins and iron. The USDA recommends that at least half of the grains consumed should come from whole-grain sources.

3.2.4 Protein Foods

Meat, poultry, fish, seafood, eggs, nuts, seeds, soy products and beans and peas make up the protein food group. Although they're included in the vegetable group for their fiber content and nutrient profile, beans and peas are also excellent sources of vegetarian protein. The USDA emphasizes choosing lean poultry and meat and consuming a variety of protein foods to enhance the overall nutritional quality of your diet. The USDA also recommends that, for non-vegetarians, at least 8 ounces of protein per week should come from seafood.

3.2.5 Dairy

The dairy food group is mostly comprised of dairy products that are high in calcium. All types of yogurt, most cheeses and all liquid milk products are part of the dairy group, as are calcium-rich milk-based desserts such as ice cream and pudding. Although the USDA counts calcium-fortified soymilk as part of the dairy group, it does not include cream cheese, cream and butter, because they're not significant sources of calcium. The USDA advocates consuming low-fat or fat-free dairy foods to limit your intake of saturated fat.

4. Basic 5 food group of ICMR

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According to Indian Council of Medical Research (ICMR) foods may be broadly classified into groups based on their nutritive value.

4.1 Cereals, Grains and Products :

This group includes cereals and millets such as rice, wheat, ragi, bajra, maize, jowar, barley, rice flakes and wheat Flour. Energy, protein, Invisible fat, thiamine, niacin, Vitamin – B2, Folic Acid, Iron and Fibre are the main nutrients present. These foods are cheap and are taken in large amounts by the low income groups.

4.2 Pulses and Legumes:

Bengal gram, Black gram, Green gram, Red gram, Cowpea, Peas, Rajmah, Soyabeans, Beans are included in this group. The nutrients present in this group are Energy, Protein, Invisible fat, Vitamin –B1, Vitamin – B2, Folic Acid, Calcium, Iron and Fibre. As these foods are protein rich , they can be helpful for protein supplementation and play an important role in alleviating protein energy malnutrition.

4.3 Milk and Meat Products:

The following foods are included in this group.

Milk: Milk, Curd, Skimmed milk, Cheese

Meat : Chicken, Liver, Fish, Egg, Meat

Protein, Fat, Vitamin –B12, Calcium. Protein, Fat, Vitamin –B2 are the nutrients.

4.4 Fruits and Vegetables:

Fruits: Mango, Guava, Tomato Ripe, Papaya, Orange. Sweet Lime, Watermelon are in this group. These fruits are rich in Carotenoids, Vitamin –C and Fibre.

Vegetables (Green Leafy) : Amaranth, Spinach, Drumstick leaves, Coriander leaves, Mustard leaves, fenugreek leaves are the vegetables present in this group. The nutrients are Carotenoids, Vitamin –B2, Folic Acid, Calcium, Iron, Fibre.

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Other Vegetables: Carrots, Brinjal, Ladies fingers, Capsicum, Beans, Onion, Drumstick, Cauliflower are included in this group and the nutrients present are Carotenoids, Folic Acid, Calcium and Fibre.

These foods provide variety in taste and texture and furnish roughage in the diet.

4.5 Fats and Sugars :

Fats :

Butter, Ghee, Hydrogenated oils, Cooking oils like Groundnut, Mustard, Coconut are in this group Energy, Fat, Essential Fatty Acids are the nutrients present.

Sugars:

Sugar, Jaggery are included and it contains Energy. All these food stuffs are concentrated sources of energy. This group constitutes about 1/6th of the energy value of the diet.

4.6 Significance of the five-food group system

The five food group system can be used for the following purpose :

- i. Planning wholesome balanced menus to achieve nutritional adequacy.
- ii. Assessing nutritional status of an individual which can disclose inadequacies of food and nutrients from any of the five groups.

5. Basic 7 food groups

The USDA introduced during World War II, a nutrition guide promoting the "Basic 7" food groups in 1943. The USDA's "Basic 7" food groups existed from 1943 to 1956. It helped to maintain nutritional standards under wartime food rationing.

5.1 The Basic 7 food groups included the following:

1. Green and yellow vegetables
2. Oranges, tomatoes, grapefruit
3. Potatoes and other vegetables and fruits
4. Milk and milk products
5. Meat, poultry, fish, or eggs
6. Bread, flour, and cereals
7. Butter and fortified margarine with added Vitamin A

6. Basic Nine Food Groups

The basic nine food groups developed by USDA is given below. The different food groups are

1. cereal and millet

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2. pulse, lentil and legume
3. milk and its products
4. nut and oilseed
5. fat and oil
6. vegetables
7. fruits
8. herbs, condiments and spices
9. meat, poultry and seafood

7. Basic Eleven Food Groups

7.1 What is Basic 11?

The Basic 11 food group was also recommended by the USDA . The food groups included the following

1. Pulses
2. Nuts and Oilseeds
3. Cereals and Millets
4. Vegetables
5. Fruits
6. Milk and Milk products
7. Eggs
8. Meat, Fish and Other animal foods
9. Fats and Oils
10. Sugar and Other Carbohydrate Foods
11. Spices and Condiments

8. FOOD PYRAMID

8.1 Definition

A food pyramid is defined as “A food pyramid is a pyramid-shaped diagram representing the optimal number of servings to be eaten each day from each of the basic food groups”

8.2 Origin of Food Pyramid

The first food pyramid was published in Sweden in 1974. The food pyramid introduced by the United States Department of Agriculture in the year 1992 was called the "Food Guide

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Pyramid". It was updated in 2005 and then replaced by MyPlate in 2011. Over 25 other countries and organisations have also published food pyramids.

8.3 Use of food groups in food pyramid

The basic food groups can be presented in the form of a food pyramid. The importance of food groups can be well understood in the form of a food pyramid. A well balanced diet can be planned with the help of the food pyramid. The role of food groups in maintaining a good nutritional status can be well imparted to the community using the food pyramid. A food pyramid can be used to develop nutrition and health guides. It promotes healthy eating in a easy-to-understand manner.

9. Summary

To summarize this module on food groups, we can say that each food group provides certain nutritional benefits, so foods from each group should be consumed each day. The key to a balanced diet is to recognize that grains (especially whole grains), vegetables and fruits are needed in greater proportion than foods from the meat, fish and beans and milk groups. A healthy and balanced diet also contains a variety of foods from within each food group, since each food offers different macronutrients and micronutrients. Eating a variety of foods also keeps our meals interesting and full of colour and flavor.