

**MARUDHAR KESARI JAIN COLLEGE FOR WOMEN
(AUTONOMOUS)**

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1st B.Sc. Nutrition FSM & Dietetics – Semester - 2

E-Notes (Study Material)

Foundation Course -1: Foundation in Home Science
Unit: 1 Introduction to Food Science Definition, Food groups and their Nutritive aspects of food constituents. Functions of food physiological, psychological and social. Relationship between food, nutrition and health.
Learning Objectives: Understand the basics in Nutrition, Food Service Management & Dietetics
Course Outcome: Describe basic concepts in Food Science, Nutrition, Dietetics and Food Service Management

Overview:

- ✧ **Food science**
- ✧ **Food Groups and their Nutritive aspects of Food**
- ✧ **Functions of Food**
- ✧ **Relationship between food**

DEFINITION

DEFINITIONS

FOOD

Food is defined as anything solid or liquid which when swallowed, digested and assimilated, nourishes the body.

FOOD SCIENCE

Food is a mixture of many different chemical components. The study of food science involves an understanding of the changes that occur in these components during food preparation whether natural or induced by handling procedures. Many physical and chemical reactions occur during food preparation. These reactions may be a result of the Interaction components, with the medium of cooking, and the environmental conditions like heat, cold, light and air to which they are subjected during cooking. Study of food science also includes understanding the nutritive value of different foods and methods of preserving them during cooking. This information provides a foundation of theory and method on which to build the study of food preparation.

FOOD ADDITIVES

Food additive is defined as non-nutritive substances added intentionally to food, generally in small quantities to improve its appearance, flavor, texture or storage properties.

FERMENTED FOODS

Fermented food is produced by the action of bacteria or moulds which act on carbohydrates and proteins present in foods and hydrolyze them to simpler products yielding predigested foods.

FOOD TECHNOLOGY

Food Technology is the application of principles of food science and engineering to the processing and preserving large quantities of food.

FOOD FORTIFICATION

Food fortification is defined as the process whereby nutrients are added to foods in relatively small quantities to maintain or improve the quality of the diet of a group, a community or a population (WHO).

NON-NUTRIENTS FOOD

Non-nutrients of foods are organic compounds having no nutritional function. They may be toxins or beneficial substances like fiber or compounds that may improve palatability or pharmacological Importance.

FUNCTIONAL FOODS

Functional food provides health benefits beyond the nutrient component when they are eaten on a regular basis in adequate amounts. Functional food has positive effect on a person's health. Physical performance or state of mind.

PHYTOCHEMICALS

Photochemical are non-nutrient compounds found in plant derived food that have biological activity in the body.

FOOD SAFETY

Food safety and regulation related to food sanitation in public health and rules and regulations governing it.

ANTIOXIDANTS

Antioxidants Include compounds that protect biological systems against the potentially harmful effects of processes or reactions that can cause excessive oxidations (USDA).

FOOD GROUPS

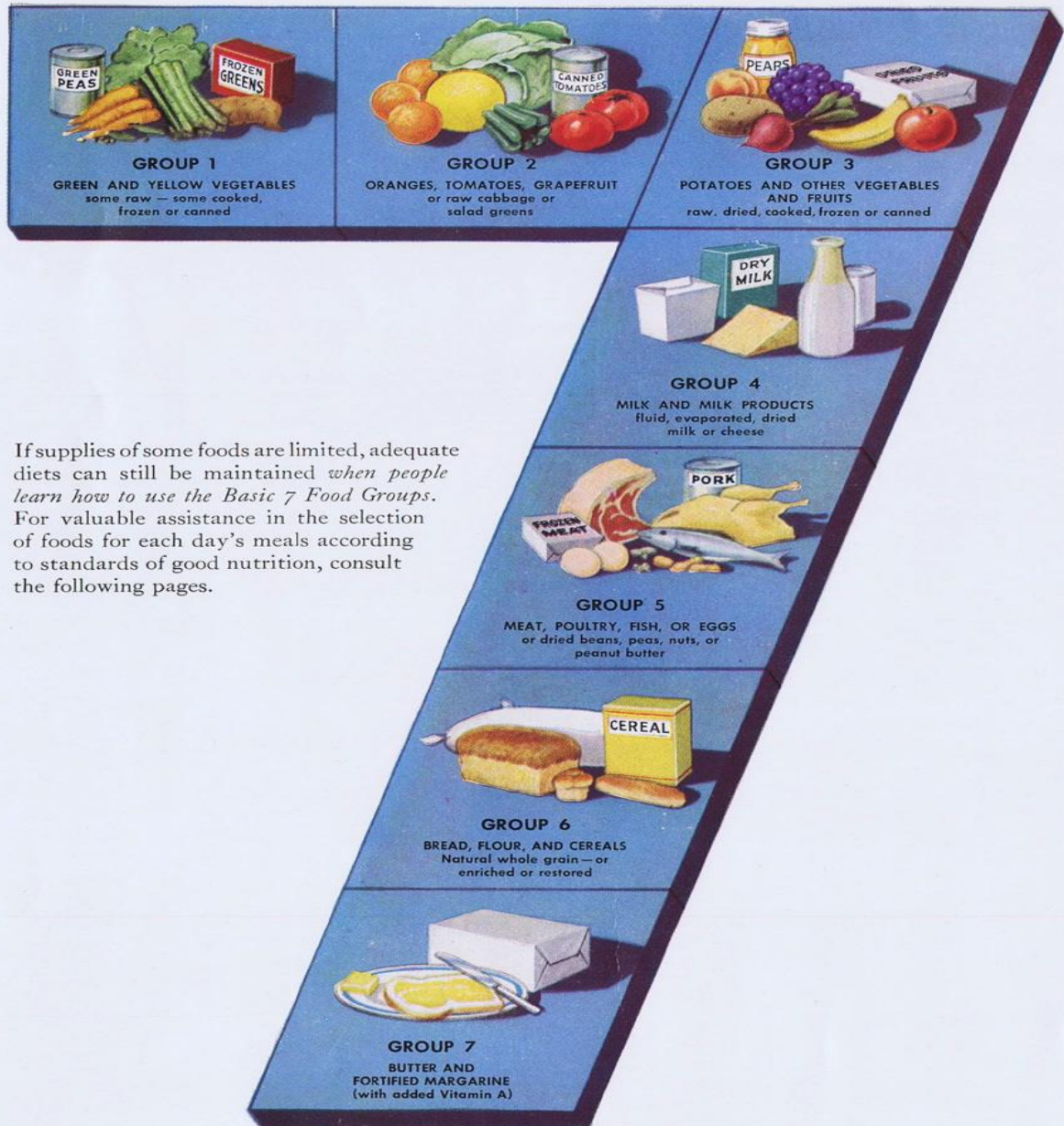
5 FOOD GROUPS

Table 1.1 Basic Five Food Groups	
Food groups	Nutrients
1.Cereal and products : Rice, Wheat, ragi, maize, bajra, rice flakes, wheat flour, sprouted cereal	Energy, protein, Invisible fat, B vitamins, iron, calcium, fiber
2.Pulses and legumes Bengal gram, black gram, cow pea, peas (dry), soybeans	Protein, energy , invisible fat, thiamine, riboflavin, folic acid, calcium, iron and fibre
3.Milk & Meat products: I) Milk and skimmed milk, cheese, curd II)Chicken, liver, fish, egg and meat	Protein, fat, riboflavin, calcium.
4.Fruits & vegetables : I) Mango, guava, tomato, papaya, orange, sweet lime, watermelon Green leafy vegetables : II) Amaranth,spinach, drumstick leaves, coriander leaves, fenugreek leaves Other vegetables : Carrot,onion,brinjal,ladiesfinger, beans, capsicum, cauliflower, drumstick	Carotenoids, vitamin C, riboflavin, folic acid, iron, fibre Riboflavin, folic acid, calcium, fibre, iron, carotenoids Carotenoids, folic acid, calcium and fibre
5.Fat & sugars : I) Fats :Butter, ghee, groundnut oil, coconut oil, hydrogenated fat, cooking oils II) Sugar and jaggery	Energy, Essential fatty acids and fat soluble vitamins Energy and iron

SEVEN FOOD GROUPS

What shall we eat today?

THE WISEST CHOICE IS THE BASIC 7 FOOD GROUPS



If supplies of some foods are limited, adequate diets can still be maintained *when people learn how to use the Basic 7 Food Groups*. For valuable assistance in the selection of foods for each day's meals according to standards of good nutrition, consult the following pages.

NUTRITIVE ASPECTS OF FOOD CONSTITUENTS

There are 6 main nutritional components of food which are: carbohydrates, proteins, fats, vitamins, minerals, and water. Carbohydrates, proteins, and fats are considered macronutrients and are what provide you with calories, or what I refer to as energy. Vitamins, minerals, and water are considered micronutrients and don't provide you with any energy. Both macronutrients and micronutrients are important to your body and provide different functions for your body. Macronutrients provide fuel for the body to give you energy as well as play crucial roles in maintaining overall health. Micronutrients don't provide you with energy but play critical roles to ensure the body operates as it should. Let's dive more in-depth with each of these categories

Macronutrients

Carbohydrates – the main role of carbohydrates is to provide energy and fuel for your body much like gas provides fuel for a car. Carbohydrates are made up of sugars or starches that are bound together. Carbohydrates get stored in your muscles and also your liver as glycogen. Your body stores carbohydrates to always make sure you have enough energy for your daily activities, even if you were to skip a meal or two. Your body breaks down those carbohydrates mainly into glucose which is the main form your cells use for energy. Carbohydrates are found in fruits, grains, rice, beans, and numerous vegetables. Some carbohydrate-rich vegetables are potatoes, yams, and corn.

Protein – the main role of protein is to provide your body with the building blocks to build cells and other tissues. Protein gets broken down into amino acids which mainly get used for growth, development, repair, and maintenance of body tissues. Protein provides structure to muscle and bones. Protein also helps to repair tissue when it gets damaged. For example, your skin has a protein in it called keratin and when your skin gets damaged then the keratin protein helps to harden the new skin cells to repair the damaged layer. Protein has a lot of functions in the human body and too many to explain in this brief summary. Good sources of protein can be found in beef, pork, chicken, fish, beans, eggs, and dairy products. There are other sources of protein as well but this is a general list of the main sources. Lastly, not all proteins are created equal. Animal proteins have been shown to have better bioavailability, or absorption, in the body. This just means that your body can absorb animal proteins better than plant proteins.

Fats – the main role of fat is to provide structure and cushion to cells and membranes. Fats help to prevent damage to the human body by providing cushion. Fats are also crucial in helping to absorb certain vitamins. The vitamins A, D, E, and K are the only fat-soluble vitamins. The rest of the vitamins are water-soluble. Dietary sources of fat are animal fats, avocados, oils, nuts, dairy, fish, and coconut. Not all fats were created equal either. Try to consume more polyunsaturated and monounsaturated fats than saturated fats. Saturated fats have been shown to increase the risk of heart disease and increase cholesterol levels. Unsaturated fats help to lower LDL cholesterol and decrease the risk of heart disease. Saturated fats are animal fats, dairy, coconut oil, and palm oil. Unsaturated fats are avocados, olive oil, fatty fish such as salmon, and nuts and seeds.

Micronutrients

Vitamins and Minerals – the main roles of vitamins and minerals is to support overall health and play an important role in cell metabolism and neurological functions. Vitamins help to aid in energy production, wound healing, bone formation, immunity, and eye and skin health. Minerals also perform a vast array of functions in the body such as providing structure to the skeleton, helping to maintain cardiovascular health, and also to act as cofactors in enzymatic reactions. Consuming a balanced diet of fresh fruits, vegetables, whole grains, dairy, and lean meats can help to ensure that your body has enough nutrients to perform all of its functions. A few examples are:

Vitamin A – helps to maintain good eyesight

Calcium and Phosphorus – helps to maintain strong bones and teeth

Iron – helps blood to transport oxygen throughout the body

Vitamin E – acts as an antioxidant and helps to maintain healthy skin

Water – the of few of the many roles of water in the body are to regulate body temperature, dissolve and aid absorption of vitamins and minerals, flush out waste products, and protect and moisturize joints. Your body is in fact about 60% water so it is a very large and important part of our health. Your body naturally loses water through breathing, sweating, and digestion so it is important to rehydrate by drinking enough water. There is no exact amount of water you need since it depends on various factors like the climate you live in, how physically active you are and other health factors. The main rule of thumb is to listen to your body. If your body tells you that you are thirsty then drink water, and if you're not thirsty then you probably have a sufficient amount of water in your system.

Functions of Food

- 1. Physiological functions
- 2. Social functions
- 3. Psychological functions

Physiological functions

- ✧ Energy yielding Foods (Protein) (Carbohydrate, protein, fat)
- ✧ Body building foods
- ✧ Protective foods (Vitamins and minerals)

Physiological functions of food:

- i. **Energy yielding foods:**

Foods rich in carbohydrates and fats are called energy yielding foods. They provide energy to sustain the involuntary processes essential for continuance of life, to carry out various professional, household and recreational activities and to convert food ingested into usable nutrients in the body.

The energy needed is supplied by the oxidation of foods consumed. Cereals, roots and tubers, dried fruits, oils, butter and ghee are all good sources of energy.

ii. Body building foods:

Foods rich in protein are called body building foods. Milk, meat, eggs and fish are rich in proteins of high quality. Pulses and nuts are good sources of protein but the protein is not of high quality. These foods help to maintain life and promote growth. They also supply energy.

iii. Protective and Regulatory foods:

Foods rich in protein, minerals and vitamins are known as protective and regulatory foods. They are essential for health and regulate activities such as maintenance of body temperature, muscle contraction, control of water balance, clotting of blood, removal of waste products from the body and maintaining heartbeat. Milk, egg, liver, fruits and vegetables are protective foods.

Social functions of food:

Food has always been the central part of our community, social, cultural and religious life. It has been an expression of love, friendship and happiness at religious, social and family get-togethers.

Food creates an atmosphere where the social relations can be developed and it helps in bringing the people from different classes, communities and religions closer. You must have often seen that each of our social gatherings and functions are followed by some type of food. At a birthday party, engagement party or a marriage party, food helps in sharing the joy and happiness of each other.

Psychological functions of food:


Food not only provides various nutrients but it also satisfies our hunger needs and gives us psychological satisfaction. You must have experienced that the food that you like gives you added pleasure. For instance, if you like rice, pakoras or halwas and you get them in your meal, you experience joy in eating these. Similarly, the food cooked by the person you love adds to your joy of eating. Very often food may be used as a reward for

achievement. A child on his good performance may be given sweets, ice-cream, etc. Similarly, withdrawal of food may be used as a punishment in some cases. This is known as the psychological aspect of food and we can say that food gives us a sense of psychological satisfaction.

RELATIONSHIP BETWEEN FOOD, NUTRITION AND HEALTH

THE RELATIONSHIP BETWEEN NUTRITION AND HEALTH

1. Food is a basic and foundational part of our lives. Food plays a vital role for human existence just as the air we breathe and the water we drink. The food we eat is utilized in the body and assimilated substances are used for growth and maintenance of the tissue.
2. People who eat right foods rich in nutrients enjoy their lives more, live longer, and are at a reduced risk of disease.
3. Good nutrition is critical in preventing not only deficiency diseases, but also chronic diseases. Nutrition is vital to our bodies as water is to plants. An unhealthy diet increases the risk of many diet related diseases.



PRACTICE QUESTION

1. Define Food
2. Write about Psychological function
3. Elaborate the functions of food in detail