3
Food Groups

3.1 Introduction
A large variety of food is available to us which we include in our daily meals for taste and variety. Needles to say, we also get the nutrients our body requires from these foods. Do you remember what these nutrients are and why they are required by our body? Yes, you are right. These nutrients are proteins, carbohydrates, fats, vitamins, and minerals. They are required in our body for energy, body, building, repair of tissues, protection from diseases and good health. We hope that you also remember that different food items are sources of different nutrients. Some foods are a good source of energy while others are good for body building or for protective functions.

In order to ensure that our body gets everything that it requires we have to select from the foods available to us. How can we be sure that we have made the right selection? What is a right meal? What are the different factors which influence the selection of foods? Is there a simple way of achieving our goal of planning right meals? These are a few questions that we will try to answer in this lesson.

3.2 Objectives
After reading this lesson you will be able to:

- explain the necessity of grouping of food;
- classify food available into five food groups;
- describe the characteristics of each food group;
- explain the need for balanced meals;
- explain the meaning of meal planning and describe various factors that influence meal planning;
● plan a balanced meal on the basis of food groups while considering other factors;
● plan a thali meal for the family.

### 3.3 Food Groups

In the previous lesson you had studied about the components of foods called nutrients, that are needed by the body in adequate amounts in order to grow, reproduce and lead a normal healthy life.

Each nutrient has its own function to perform in the body, but more than one nutrients may also perform the same function. All individuals need the same nutrients for the same body functions. Variation in the diet has to be provided according to the age, sex, activity, taste, etc. So let us see how these varieties can be brought about.

For the purpose of planning meals, the foods available can be broadly divided into three groups from the nutritional point of view. These are:

- Energy yielding foods
- Body building foods
- Protective foods

Now let us see what all nutrients are provided by these three food groups.

<table>
<thead>
<tr>
<th>Function</th>
<th>Major Nutrients</th>
<th>Food Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Building</td>
<td>Proteins</td>
<td>Milk, meat and chicken</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pulses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pulses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cereals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fats and sugar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fruits and vegetables</td>
</tr>
<tr>
<td>Energy Giving</td>
<td>Carbohydrates and Fats</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protective</td>
<td>Minerals and Vitamins</td>
<td></td>
</tr>
</tbody>
</table>

All food can also be grouped into five food groups. In this system of food grouping similar food items are placed together. For example all cereals are similar in nutritive content and also similar in functions and all pulses are also similar in nutritive content. Similarly milk, egg and flesh foods are comparable and all oils, butter, ghee have similar nutrients. Therefore, if we substitute one food for the other in the same group we will, to a large extent, get the same nutrients. For example, whether we select wheat flour or maize, rice or bajra we would get approximately the same nutrients and these perform
the similar functions in the body. The five food group table is given below:

**Five Food Group System**

**Table 1**

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Food Stuffs</th>
<th>Main Nutrients</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cereals</strong></td>
<td>Rice, wheat, ragi, bajra, maize, jowar, barley, riceflakes, wheat flour.</td>
<td>Energy, protein, invisible fat, Vitamin B iron, fibre</td>
</tr>
<tr>
<td><strong>Pulses</strong></td>
<td>Bengalgram, blackgram greengram, redgram, lentil (whole as well as dhals), cowpea, peas, rajmah, soyabean, beans, etc.</td>
<td>Energy, protein invisible fat, Vitamin B calcium, iron, fibre</td>
</tr>
<tr>
<td><strong>Milk, egg and flesh foods</strong></td>
<td>Milk: curd, milk, cheese, paneer</td>
<td>Protein, fat, Vitamin-B calcium</td>
</tr>
<tr>
<td><strong>Meat</strong></td>
<td>Chicken, liver, fish, egg, meat</td>
<td>Protein, fat</td>
</tr>
<tr>
<td><strong>Fruits and Vegetables</strong></td>
<td>Fruits: Mango, guava, tomato ripe, papaya, orange, sweet lime, water melon</td>
<td>Vitamin A, Vitamin-C fibre</td>
</tr>
<tr>
<td></td>
<td>Vegetables (Green Leafy): Amaranath, spinach, gogu, drumstick leaves, coriander leaves, mustard leaves, fenugreek leaves.</td>
<td>Invisible fats, Vitamin A Vitamin B, calcium, iron, fibre</td>
</tr>
<tr>
<td></td>
<td><strong>Other Vegetables:</strong> Carrot, brinjal, ladies fingers, capsicum, beans, onion, drumstick, cauliflower</td>
<td>Vitamin A, calcium, fibre</td>
</tr>
<tr>
<td><strong>Fats and Sugars</strong></td>
<td><strong>Fats:</strong> Butter, ghee, hydrogenatedoils, cooking oils like ground nut, mustard, coconut.</td>
<td>Energy, fat</td>
</tr>
<tr>
<td></td>
<td><strong>Sugars</strong> Sugar, jaggary</td>
<td>Energy</td>
</tr>
</tbody>
</table>

Note: The energy is mainly provided by carbohydrates in cereals, pulses and sugars.
Before we learn how we can make use of this grouping system to plan our meals let us learn more about the groups that we have formulated.

A. Cereals

Cereals form the bulk of our daily meals. They are the main and also the cheapest source of energy. The quality of protein obtained from cereals improves considerably when eaten with pulses, meat, curds, or egg.

Cereals should be eaten in unrefined form. The refined form of wheat, called ‘maida’, has no fibre and vitamin B in it. Home pounded or parboiled rice is better than the polished rice.

Sprouting cereals helps in improving their vitamin C content. Similarly fermenting the dough improves its vitamin B content.

B. Pulses

Pulses, as you know, are a good source of protein specially for those who are vegetarians. They also contain vitamin B, calcium and iron. As said earlier, when they are teamed with cereals the protein quality improves. Can you tell why? Germination of pulses improves their vitamin C content.

INTEXT QUESTIONS 3.1

1. Name the five food groups
   a) 
   b) 
   c) 
   d) 
   e) 

2. Select the most suitable alternative -
   (i) Cereals are a good source of
      a) proteins and carbohydrates
      b) proteins and fats
      c) proteins and vitamin A
      d) carbohydrates and fats
(ii) Cereals do not provide
   a) fat
   b) iron
   c) vitamin A
   d) vitamin B

(iii) Quality of protein in cereals can be improved by
   a) adding pulse
   b) adding vegetables
   c) fermentation
   d) sprouting

(iv) Sprouting of cereals helps in improving the content of
   a) vitamin A
   b) vitamin B
   c) vitamin C
   d) protein

(v) Pulses are a major source of
   a) proteins
   b) vitamin C
   c) carbohydrates
   d) vitamin D

(vi) In order to improve the vitamin C content of pulses we must
   a) ferment them
   b) combine them with vegetables
   c) mix them with cereals
   d) sprout them

(vii) A combination of sprouted pulse and cereals will provide quality
   a) proteins and vitamin C
   b) proteins and carbohydrates
   c) protein and vitamin A
   d) carbohydrates and vitamin C
C. Milk, Egg and Flesh Foods

Any form of milk - fresh, powdered or condensed, is a good source of protein, fat, vitamin B and calcium. Skimmed milk contains very little fat. Curds contain all the nutrients which milk has and cheese has mainly protein. Do you know why? Yes, you are right. For making curds we use whole milk while for making cheese we take out the water and therefore all other nutrients which are soluble in water are also taken out.

Milk protein is of good quality and this is why milk is considered good for children.

Eggs are a rich source of all nutrients except vitamin C. Egg protein is the best and is very suitable for growing children, pregnant women and lactating mothers.

Flesh foods include, meat, poultry and fish. They are rich in proteins, vitamin A and Vitamin B. Proteins obtained from this group of foods is much better than protein obtained from pulses. But because a large percentage of population in India is vegetarian, they do not consume eggs or meat and depend on cereals and pulses for protein supply.

D. Fruits and Vegetables

Fruits: specially citrus fruits, are good sources of vitamin C. Amla and Guava are also rich in this vitamin. Yellow fruits like mango, pappaya contain plenty of carotene which is converted into vitamin A in the body. Dried fruits like figs, walnuts, almonds, peanuts, etc, are rich in vitamins iron and calcium. All fruits contain fibre which helps in bowel movement.

Green leafy vegetables : Palak, methi, soya, cholai, mint, etc. are some examples of green leafy vegetables. They are rich in calcium, carotene, iron, folic acid, vitamin C. They are also inexpensive. It is good to plant them in the house and get a regular fresh supply.

Roots and tubers: Potatoes, sweet potato, carrots, are some of the tubers and roots which are commonly eaten in our country. They are rich in carbohydrates and hence a good source of energy. Carrots are rich in carotene and potatoes in vitamin C.

Other vegetables like brinjal, ladies fingers, beans, gourds, tomatoes, etc, provide variety, some mineral and bulk to the daily meals. Some of these also contain vitamin C.

E. Fats and Sugar

Butter, ghee, oil, are the common forms of fats consumed in India. All fats are concentrated sources of energy. But they also provide us the essential fatty acids. Hence some amount of fat is necessary in our meals everyday. It is an expensive items and hence its consumption is usually related to the money available.
Sugar, and jaggery are sweetening agents and supply energy. Jaggery may contain some iron too. However, its consumption can be optional. In other words, we do not lose anything if we do not include sugar or jaggery in our meals everyday.

**PYRAMID OF FOOD GROUPS**

SUGGESTED QUANTITY FOR AN ADULT/DAY  
(Approximate quantity in raw form)

1. **Cereals and millets** - Highest quantity
2. **Vegetables, fruits** - Moderate quantity
3. **Milk, milk products, meat, fish, egg.** - Moderate quantity
4. **Pulses** - Low quantity
5. **Fats & Sugar** - Low quantity

Note: 1 cup = 250 ml; 1 tablespoon (tbs) = 15 to 20 g

REMEMBER TO CONSUME FOODS FROM EACH OF FIVE FOOD GROUPS THE TO ENSURE A BALANCED DIET

### INTEXT QUESTIONS 3.2

i) Skimmed milk lacks in
   a) calcium
   b) fat
   c) protein
   d) vitamin B₂

ii) If you need to replace milk, choose
   a) cereal
   b) leafy vegetables
   c) pulse
   d) cheese
iii) For good quality protein, which of the following should be our choice?
   a) apple
   b) egg
   c) spinach
   d) cabbage

iv) Which of the following foods have all nutrients?
   a) butter
   b) egg
   c) meat
   d) pulse

v) Flesh food are rich in good quality protein and
   a) fibre
   b) carbohydrates
   c) Vitamin B
   d) Vitamin C

(vi) Green leafy vegetables are good source of
   a) calcium and iron
   b) calcium and carbohydrates
   c) carbohydrates and proteins
   d) fat and protein

vii) Potatoes are a source of
   a) body building materials
   b) energy providing materials
   c) protective materials
   d) all nutrients

viii) Fats are concentrated sources of
   a) energy
   b) proteins
   c) minerals
   d) vitamins
ix) A food item that provides only energy is
   a) bajra
   b) rice
   c) sugar
   d) wheat

x) Take fruits for
   a) energy
   b) proteins
   c) vitamin B₂
   d) vitamin C

2) List 5 names for each of the following:
   i) Cereals
      ___________________________
   ii) Pulses
       ___________________________
   iii) Yellow vegetables and fruits
        ___________________________
   iv) Flesh foods
       ___________________________

3.4 BALANCED MEALS

While planning a meal if we use food from all the food groups, then we are sure that we will get all the nutrients. Such a diet will be known as balanced meal.

So we can say that-

A meal which has included all the nutrients in adequate and appropriate amounts is called a balanced meal or diet.
The components of a balanced diet will differ according to age, sex, physical, activity, economic status and physiological state, that is, pregnancy, lactation etc.

3.5 Meal Planning

Meal planning is a process of deciding what we should eat each day at each meal.

You can also say that meal planning is, really speaking, a decision making about the foods you will eat on any one day.

Importance of meal planning

What is your meal pattern of a day? You have breakfast, lunch and dinner. Your body gets the supply of nutrients regularly from these three meals of the day. Hence it is necessary to make sure that all the three meals include foods which would provide to your body every thing that it requires.

- Besides your own requirements, you will look into the needs of other members of the family.
- Once you know about the requirements of each family member you also look into the preferences or likes and dislikes of individual members and try to include dishes which fulfill the nutritional requirements and which are also liked by everyone.
- You have time to collect things, cook and serve the meal on time in an attractive manner because you have planned the days meals in advance.
- You can also make good use of left overs in the kitchen or in the refrigerator.

3.6 Factors Affecting Meal Planning

There are many factors which influence meal planning. Some of these are listed and described here.

i) **Age:** Infants drink only milk or eat semi liquid foods like dalia or khichri. Young babies and children eat everything but in small quantities. Hence they have to be fed more often as compared to adults. Adults and old people may suffer from some health problem and therefore cannot eat certain foods e.g., if suffering from diabetes, they should not eat rice, potatoes, sugar etc. If suffering from constipation, they need more of fibre as compared to other adults. In other words, age of an individual influences both the quantity and the quality of food and while planning the meal we have to keep this in mind.

ii) **Sex:** Men are more muscular than women and they can do more manual and strenuous work as compared to women. Hence they need more proteins and energy than the women.
Climate: Do you tend to eat more in winter than in summer? This is because in winter our body needs more energy and therefore, we tend to include more of the energy rich foods.

Occupation: Some people do more manual work. Others work while sitting most of the time. Farmers, player, labourers need more food and food which is rich in energy and proteins. An adult who is sitting most of the time needs less energy giving foods.

Individual, physical needs of the members: A growing child needs more proteins. A sick person needs a diet which is light and easily digestible. A person suffering from constipation needs more fibre and a pregnant woman also needs food for the foetus who is growing in her womb. A lactating mother has to feed her baby hence her need for nutrients increases.

Economic position: Selecting of food items gets limited if a family has limited income. Cheese, meat, fish, milk, nuts, etc. are expensive items. A family can include these in the daily meal only if they have money to buy. It does not mean that these items are essential for balanced meals. These just provide variety and if one can afford one must include them in meals regularly but if one can not, one can still manage to eat a balanced meal.

Points to be kept in mind while planning a meal

Meal planned should be such that it-

- meets nutritional requirement
- fulfils family needs
- saves time and energy
- provides variety
- gives satiety
- takes into consideration individual likes and dislikes
- is not expensive

3.6 Food for the Family

You must by thinking, if there are so many factors which influence the planning of a balanced meal how difficult it must be to achieve this goal! No it is not like that. You know that everyone whether young or old, man or woman, boy or girl, sick or healthy needs a balanced meal i.e., a meal which contains all the necessary nutrients that are required by the body i.e., proteins, carbohydrates, fats vitamins A, B₁, B₂, B₁₂, C and D, iron, calcium, etc. When you are planning meals for the day, see that every meal has these important nutrients in it. How will you make sure that these nutrients are there?
Simple! Use the knowledge of five food groups. Include in every meal at least one item, if not two, from each group. One such simple meal would be follows:

<table>
<thead>
<tr>
<th>Five groups</th>
<th>Meal</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) Cereals</td>
<td>chapatis or rice</td>
</tr>
<tr>
<td>ii) Pulses</td>
<td>dal-moong or arhar</td>
</tr>
<tr>
<td>iii) Milk, egg and flesh foods</td>
<td>curd or raita</td>
</tr>
<tr>
<td>iv) Fruits and vegetables</td>
<td>palak and cauliflower vegetables and guava</td>
</tr>
<tr>
<td></td>
<td>or methi and carrots vegetable and orange.</td>
</tr>
<tr>
<td>v) Oil, ghee and sugar</td>
<td>oil/ghee would be used for cooking these items.</td>
</tr>
</tbody>
</table>

You can plan many more meals of this type. You can call these the initials or the family pot or the family meal or the thali meal.

You can then make adjustments and/or modifications in this meal/family pot to suit the individual requirements. What are these adjustments?

You know that boys eat more than girls and men eat more than women. This is a difference of quantity. Hence what do you do? Just increase the portions i.e. if you give two chappatis to a girl, give three/four to the boy and similarly increase the amount of dal, sabzi and curd.

Young children can eat only small amounts at one time. Hence, feed them more frequently. If you give three meals a day to adults i.e., breakfast, lunch and dinner, to children, give five. To do this add one meal between breakfast and lunch and another -between lunch and dinner. These can be just nutritious snacks - wheat biscuits with nuts, paushtic poha/upma - pressed rice or suji cooked with some amount of spinach, peanuts and seasonal vegetables. We are sure you can think of many more similar snacks. For an infant who cannot yet eat solids, mash some cooked rice, add dal and whatever vegetables you have cooked. Just take care that you take out some portion for the child before you add spices like chillies and garam masala!

If there is a lactating mother in the family increase the quota milk and/or curds in her meals. Give her 1-2 eggs in addition to the regular meal. For a pregnant woman, add egg/paneer and or extra milk if she likes.

Everybody must have enough fibre from the meals and for this make sure that you use whole wheat flour, green leafy vegetables and fruits. For a person suffering from constipation make sure that there is a fruit like guava or pappaya besides whole wheat chappati and a leafy vegetable. If a person is diabetic, see that you leave out rice, sugar and potato from the meal.
Aren’t these modifications simple and practical? These are only a few suggestions about how you can modify the family pot to suit individual needs. We are sure that we have been able to trigger your imagination and as such you will be able to deal with any situation with ease, where modifications of meals are required.

**INTEXT QUESTIONS 3.3**

1. Define the terms in your own words -
   (i) Meal planning
   (ii) Balanced meal
   (iii) Family pot/meal

2. List 5 factors that influence meal planning.
   i) 
   ii) 
   iii) 
   iv) 
   v) 

3. Give two reasons for meal planning meals for your family.
   i) 
   ii) 

4. Point out what is wrong with the following meals and suggest corrections.
<table>
<thead>
<tr>
<th>Lunch</th>
<th>Faults</th>
<th>Suggestions</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) Rice and boiled potato vegetable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii) Chappati and cauliflower vegetable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.7 What You Have Learnt

Balanced Meal
A meal that contains all nutrients that body needs

Meal Planning
takes into consideration

Economic position Age Sex Occupation Individual Physical Needs Climate

Family Meal can be Modified For

3.8 Terminal Exercises

Present a balanced meal and carry out modification to the meal to suit a pregnant woman, adolescent boy and a preschool boy.

3.9 Answers to Intext Questions

3.1 1. a) cereals  
    b) pulses  
    c) milk, egg and flesh foods  
    d) fruits and vegetables  
    e) sugar & oil  
    2. i) a  
       ii) a  
       iii) a  
       iv) c  
       v) a  
       vi) d  
       vii) a

3.2 1. i) b  
       ii) d  
       iii) b  
       iv) b  
       v) a  
       vi) a  
       vii) b  
       viii) a  
       ix) c  
       x) d  
    2. Please see the text (Section 3.3)

3.3 1. Please see the text (Section 3.3)  
    2. Age, sex, occupation, climate, individual physical status.  
    3 i) To provide balanced meal for every member.  
       ii) To collect all ingredients and cook.  
    4. FAULT SUGGESTIONS  
       i) Only Carbohydrates, no proteins minerals, vitamins. Represent only two food groups cereals and root vegetables.  
       Add green leafy vegetables, yellow vegetables, fruit, seasonal vegetables, curds.  
       ii) Only two groups of food represented.  
       Add at least one item from each group.