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Food is an essential part of everyone's lives. It gives us energy and nutrients to grow, develop and maintain, be healthy and active, to move, work, play, think and learn. The body needs a variety of nutrients such as - carbohydrates, proteins, fat, vitamins and minerals from the food that we eat. Our body gets these nutrients through a variety of food available. Generally food supplies all the nutrients, however, no single food item can provide all the nutrients in adequate amount required by our body. Therefore, a wise selection of food, in order to plan a meal is very necessary so that these food provide all the nutrients required by an individual in an adequate amount to maintain good health.

Need of food grouping

- 1) Foods grouped together give an idea on accounts of the key nutrients of that food group. For example, milk, yogurt, cheese contain calcium and proteins, while the fruit group is a good source of fibre, vitamins and minerals.
- 2) It is also important to enjoy a variety of foods within each food groups because different foods vary in the amount of the key nutrients that they provide. For example, in the vegetable food group, carrots and pumpkin contain significantly more vitamin A than other vegetables such as potatoes.

3.1 Classification of food into four food groups

Foods are classified into four food groups according to the nutrients present in them. These food groups help in wise selection of foods to plan a balance diet.

The four basic food groups are as follows:

- 1) Cereals, Millets and Pulses
- 2) Vegetables and Fruits
- 3) Milk and Milk products, Egg, Meat, Fish, Poultry and their products
- 4) Fats and Oils, Nuts and Oilseeds, Sugar.

1) Cereals, Millets and Pulses Group:

This group includes

- i) **Cereals:** Wheat, rice and their products like wheat flour (*atta*), semolina (*rawa*), refined wheat flour (*maida*), vermicelli (*sevai*), puffed rice (*churmura*), flaked rice (*poha*), rice flour, bread, noodles, and other such items.
- ii) **Millets:** Sorghum (*jowar*), *bajra*, maize, ragi (*nachni*), corn flakes, puffed *jowar*, ragi malt and others. Cereals and millets are rich source of energy as they are rich in carbohydrates. Millets are considered

as coarse grains. Generally the size of one portion for Cereals and Millets is considered as 30g.

Number of portion per day for Cereals and Millets: 9 to 20

- iii) **Pulses and Legumes:** Legumes such as bengal gram (*chanal/harbara*), black gram (*urad*), green gram (*mung*), lentil (*masoor*) and their *dals* and red gram *dal* are included. Some other legumes like cowpea (*chawli*), moth beans (*matki*), dry peas (*watana*), soybean and field beans (*val*) are also included.

Pulses and legumes are rich source of proteins.

Size of one portion is considered as 30 g

No. of portion per day: 2 to 4

Cereals, millets, and pulses also provide B-Complex vitamin, minerals and fibre.

2) Vegetables and Fruits Group:

Vegetable: It includes leafy vegetables, roots and tubers and other vegetables.

- i) **Green Leafy Vegetables:** (GLV) Spinach (*palak*), fenugreek (*methi*), coriander (*kothimbir*), onion leaves (*kanda pat*), amaranth (*math*), colocasia leaves (*aalu pane*), radish leaves, salad leaves, cabbage (*patta kobi*), dill leaves (*shephu*), drumsticks leaves (*shevga pala*) and others. These leafy vegetables are rich in vitamins like beta-carotene, vitamin C and minerals like calcium, iron and fibre.

Size of one portion is considered as: 100 g

Number of portion per day: 1

- ii) **Roots and Tubers:** These include potatoes, sweet potatoes, colocasia, tapioca, beetroots, carrot and radish. Roots and tubers are rich sources of carbohydrates (mainly in the form of starch).

Size of one portion is considered as: 100 g

Number of portion per day: 2

- iii) **Others vegetables:** These include all other parts of the plant like fruits, flowers, seeds, nuts, pods and others. Vegetables such as ladies finger, tomato, brinjal, peas, french beans, red pumpkin, all types of gourds and all other vegetables not included in subgroups i and ii are included in this group.

Size of one portion is considered as: 100 g

Number of portion per day: 2

- iv) **Fruits:** It includes beta carotene rich fruits such as orange, fig, pomegranate, mango, papaya, etc., vitamin C rich fruits such as Indian gooseberry (*amla*), guava, orange, lemon, sweet lime, pine apple, straw berry, custard apple (*seetaphal*), cashew apple fruit and others are also included in this groups.

Other fruits such as apple, grapes, banana, water melon, cherry, peach, plums, pears, sapota (*chiku*), jamun, etc.

Do You Know ?

All fruits provide carbohydrates in the form of sugar, fibre, vitamins and minerals.

Size of one portion is considered as:
100 g

Number of portion per day: 1

3. Milk and Milk Products, Eggs, Meat, Fish, Poultry and their products:

i) **Milk:** This includes whole milk, toned milk (low fat), double toned milk (very low fat), skim milk, condensed milk, powdered milk, etc.

ii) **Milk products** include curd, khoa, cheese, paneer, yoghurt (except butter, pure ghee and cream), which are a good source of proteins, vitamins like B complex, vitamin A and minerals like calcium.

Size of one portion of milk is considered as: 100 ml

Milk products: 50 grams

Number of portion per day: 3

iii) **Eggs** - Chicken eggs, duck eggs

iv) **Meat:** Red meat, lean meat, beef, lamb, veal, pork are good source of iron, zinc and B12 vitamin.

v) **Fish and sea-foods** - Fish, prawns, crab, lobster, mussels, oysters, scallops, clams are good source of vitamins, minerals, proteins and omega 3 fatty acids.

vi) **Poultry:** Chicken, turkey, duck, goose

Size of one portion is considered as:
50 grams

Number of portion per day: 1

Do You Know ?

1 medium size egg weight is approximately 50 grams.

4) Oils and Fats, Nuts and Oilseeds, Sugar:

i) **Oils and Fats:** This group includes oils and fats like butter, pure ghee, cream, vanaspati ghee and vegetable oils which are a concentrated source of energy.

Size of one portion is considered as:
5 grams / 5 ml

Number of portions per day: 4 to 8

ii) **Nuts and Oilseeds:** These includes groundnuts, gingelly seeds (*til*), cashew nuts, almonds, dry coconut, fresh coconut, walnut, etc. These are rich source of energy, proteins and minerals.

iii) **Sugar:** This group includes cane sugar, jaggery, honey, etc. Sugar is a good source of energy

Size of one portion is considered as: 5 grams

Number of portions per day: 4 to 11

Do You Know ?

Milk and Milk Products provide good quality nutrients

3.2 Contribution of food groups to the diet:

Selection of different foods from the four food groups will avoid monotony and bring variety in the diet. If these foods are consumed in appropriate amounts, it will lead to good health. Table 3.1 shows the use of food groups and their contribution to the diet.

Table 3.1: Four food Groups

Food Groups	Foods	Size of Portion (g)	Number of Portions /day for adults	Nutrients Present
1. Cereals, Millets and Pulses	Cereals and its products	30	9 to 20	Carbohydrates, B Complex, Vitamin A and minerals
	Millets and Its Products	30		
	Pulses and legumes	30	2 to 4	Proteins, B-Complex Vitamins, Minerals
2. Fruits and Vegetables	i. Fruits	100	1	Carbohydrate, Vitamins and Minerals
	ii. Vegetables			
	a) Green Leafy	100	1	Beta-Carotene, Calcium, Iron and Fiber
	b) Roots/Tubers	100	2	Carbohydrate
	c) Other Vegetables	100	2	Minerals, Fiber
3. Milk and Milk Products	i. Milk and Milk Products	100 ml 50 grams	3	Protein, Vitamins and Minerals
	ii. Meat, Poultry Fish and Egg	50grams	1	Protein, Vitamins and Minerals
4. Oils and Fats, Nuts and Oilseeds, Sugar	i. Oils and Fats	5 grams	4 to 8	Energy
	ii. Nuts and Oilseeds	5 grams	4 to 8	Energy, Proteins and Minerals
	iii. Sugar	5 grams	4 to 11	Energy

Reference: Dietary Guidelines for Indians, A Manual, National Institute of Nutrition, 2nd Edition 2011.

3.3 Concept of Balanced diet:

All individual should get all the nutrients in adequate proportions from the diet to maintain good health. The food groups serve as a guide to plan this type of diet which is called as balanced diet.

Balanced diet is a diet, which supplies all the essential nutrients in adequate amounts according to an individual's age, sex, physiological status and physical activity, it also provides amounts of nutrients for growth, development, wear and tear of the body and a small reserve for emergency.

The nutritional requirement of an individual varies according to a person's age, sex, physical activity and physiological condition. Daily requirement of some nutrients for the individuals is given in Table 3.2

Table 3.2: Recommended Dietary Allowance for Indians (Macronutrients and minerals)

Group	Particulars	Body wt. kg	Net Energy Kcal/d	Protein g/d	Fat g/day	Calcium mg/d	Iron mg/d
Man	Sedentary Work	60	2320	60	25	600	17
	Moderate Work		2730		30		
	Heavy Work		3490		40		
Woman	Sedentary work	55	1900	55	20	600	21
	Moderate work		2230		25		
	Heavy work		2850		30		
	Pregnant Woman		+350	82.2	30	1200	35
	Lactation		+600	77.9	30	1200	25
	0-6 months						
6-12 Months	+520	70.2	30				
Infants	0-6 Months	5.4	92Kcal/kg/d	1.16g/kg/d	--	500	--
	6-12 Months	8.4	80Kcal/kg/d	1.69g/kg/d	19		46µg/kg/d
Children	1-3 Years	12.9	1060	16.7	27	600	09
	4-6 Years	18	1350	20.1	25		13
	7-9 Years	25.1	1690	29.5	30		16
Boys	10-12 Years	34.3	2190	39.9	35	800	21
Girls	10-12 Years	35.0	2010	40.4	35	800	27
Boys	13- 15 years	47.6	2750	54.3	45	800	32
Girls	13-15 Years	46.6	2330	51.9	40	800	27
Boys	16-17 Years	55.4	3020	61.5	50	800	28
Girls	16-17 Years	52.1	2440	55.5	35	800	26

Reference: Dietary Guidelines for Indians, A Manual, National Institute of Nutrition, 2nd edition, 2011

Planning of balance diet using food group:

The following points should be considered while planning a balance diet for an individual

- Include foods from all food groups in the daily diet.
- According to requirements of the individual, correct number of portions from each food group should be included in the diet.
- Variety of foods should be selected from within each sub group because food within the sub group have a similar but not identical nutritive value.
- Variety in selection will also bring variety to the meals.
- In a vegetarian diet, to improve the quality of proteins, either use a cereal/pulse combination or incorporates small quantity of milk or milk products in the meal.
- Include uncooked vegetables and fruits in the meals.
- Use seasonal fruits and vegetable which are delicious, cheap and nutritious.
- Use green leafy vegetables (GLV) in every day diet.

While planning a balanced diet, in addition to the above factors, food pyramid should be considered (Fig. 3.1)

The food pyramid offers a pattern for daily food choices based on the serving from the four basic food groups.

- ➔ The first food group consisting of cereals, millets, pulses and their products is the broad base of the pyramid as it is the base of good diet.
- ➔ Second group is vegetables and fruits which is in the next layer (rich in minerals, vitamin and fibres).
- ➔ The third group is rich in protein which forms the next layer.
- ➔ At the tip of the pyramid, the fats, sugars and their products are included. These

foods are assigned the smallest area in the pyramid indicating that these foods should be a very small part of our diet.

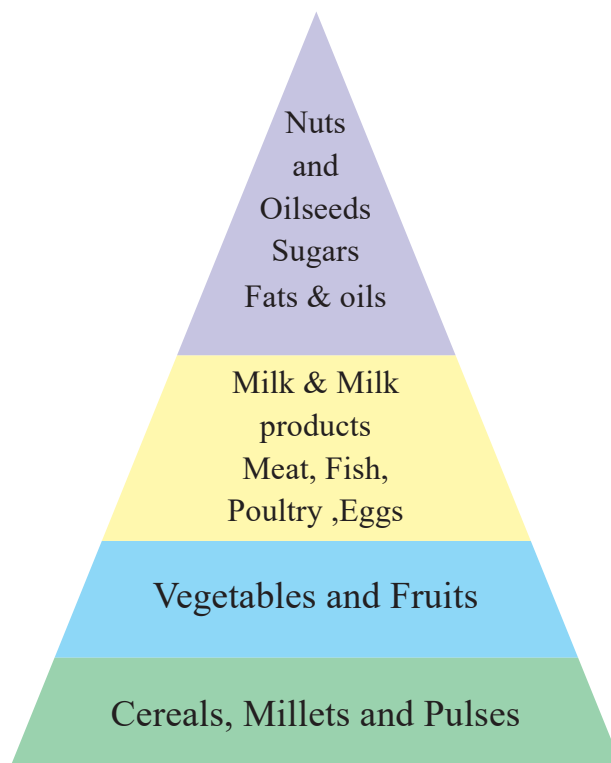


Fig. 3.1 : Food pyramid

Points to remember

- Different types of foods are classified into four food groups on the basis of the nutrients present in them.
- The food groups serve as a tool to plan a balanced diet.
- Variety of foods should be selected from within each sub group because their nutritive value is similar but not identical.
- The factors to be considered while planning a balanced diet are sex, age, type of work, financial status, physical state of a person, availability of food, likes and dislikes, climate and variety, etc.
- Food pyramid offers a pattern for daily food choices based on the serving from the food groups.

Exercise

Q.1 (a) Select the most appropriate option:

- i. The major nutrients provided by pulses and legumes group are
(protein, vitamin, fat)
- ii. Fats and sugars group mainly provide.....to the body
(energy, strength, satiety)
- iii. Different types of foods are grouped into four basic food groups on the basis of thepresent in them.
(protein, nutrient, carbohydrates)
- iv. Green leafy vegetables are good source of nutrients.
(protein, fat, vitamins)
- v. Top group of pyramid provide
(fruits, oilseeds, millets)

(b) State whether the following statements are true or false:

- i. Cereals and whole grains are rich source of protein.
- ii. Carbohydrates are the major nutrient and energy source present in vegetables
- iii. 1 g of carbohydrates gives 4 kcal energy value.
- iv. Legumes and pulses are rich source of proteins.
- v. Milk and milk products are rich in fiber.

(c) Match the followings:

A		B	
i.	Toned milk	a.	Rice
ii.	Millets	b.	Rich in fiber
iii.	Cereals	c.	Lentil
iv.	Pulses	d.	Sorghum
v.	Vegetables	e.	Rich in beta carotene
vi.	Carrot	f.	Soyabean
vii.	Oilseeds	g.	Low fat Milk product
		h.	Meat and Fish

Q.2 Answer in brief (Give two examples of the followings)

- i. Milk products
- ii. Cereal products
- iii. Fruit products
- iv. Green leafy vegetables
- v. Orange coloured beta carotene rich vegetables
- vi. Vitamin A rich fruits
- vii. Vitamin C rich fruits
- viii. Pulses/*dals*
- ix. Millets
- x. Sugar products
- xi. Iron rich food

Q.3 Short answer question

- i. Explain food pyramid with the help of diagram.
- ii. Explain fruits and vegetables groups.

Q.4 Long answer questions

- i. Define balanced diet. Write in detail the way to plan a balanced diet.
- ii. Discuss in detail the protein rich food group.

❖ Project :

- i. List the food items used to prepare the following recipes and classify the items of each recipe into four basic food groups
 - a) *Potato paratha*
 - b) *Palak poori*
 - c) *Sabudana khichadi*
 - d) *Gulab jamun*
 - e) *Dal khichadi*
- ii. Prepare variety of visual aids on four food groups and arrange an exhibition.

