

### Sources of Food





#### Introduction

Food is any substance that provides an organism with nourishment. Food is eaten by human beings and other animals to sustain life and health. Food provides chemical substances which are needed for the following purposes:

- » Building of new cells and tissues.
- » Providing energy to the body.
- » Providing nutrients for the repair of old, worn-out cells.
- » And above all, regulating all the body processes in an organism.

Food for our health: You know very well that, no one can live without food. Both overeating and lack of food intake could be harmful. Proper food provides us energy for various body activities, protects us from diseases and regulates our body functions. There is no single perfect food that alone can supply all the requirements for proper nutrition. For this reason we have to use different types of food daily just to maintain our health.

#### 1.1 VARIETY IN FOOD

Activity 1.1

There seems to be so much variety in the food that we eat. Let us find out, what are these food items made of?

Can you see different food items placed in three plates in front of Ritu. Please help her to distribute them using the following table:

Table 1.1. Categorisation of different food items.

Breakfast	Lunch	Dinner  Rice, Chapatti, Milk	
Banana, Egg, Apple, Parantha	Palak Paneer, Dahi-vada, Salad, Pulses, Chapatti		
***************	***************************************		
******************	*****************		

Herbivore: Animals eating plants and plant products.

Carnivore: Animals eating other animals.

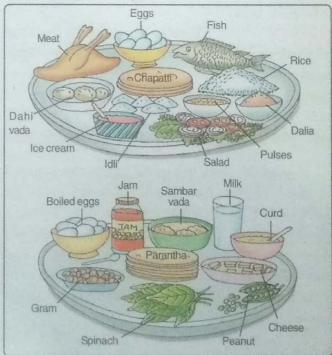
Omnivore: Animals eating both plants and animals.

Organism: Any plant or animal. The term is also applied to living things such as bacteria and fungi which are neither plants nor animals.

**Nutrients**: The substances which an organism obtains from its surroundings and uses it either as an energy source or for growth of body parts.

Minerals: Naturally occurring elements in nature are called minerals. These are necessary for proper growth of the body and maintaining good health.

(You may use your own experience in helping out Ritu for the distribution of food items). Some hints are given to you.



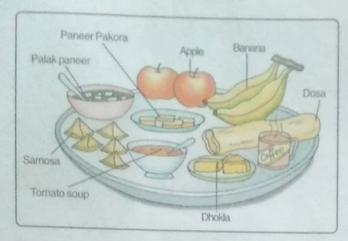


Fig. 1.1. Different type of food items which can be used for various meals.

#### Research Work for the Above Activity

What are the food items that Ritu should eat:

- (a) Before going to school,
- (b) In the school,
- (c) After returning from school?

Match your answer with your classmates. Do you find it different. If so, why?

HINT: You will find that different people give different answers.

From the above research work you can easily interpret that, "different people have different choices of food". There is a variety in the kind of food consumed even within a state. This means that, 'there is a range of variation of food items eaten over various states of India'.

#### 1.2 FOOD MATERIALS AND SOURCES

It may be easy for us to guess the sources of some of the ingredients that we listed in Table 1.2. Fruits and vegetables, for instance. Where do they come from? Plants, of course! What are the sources of rice or wheat? You may have seen paddy or wheat fields with rows and rows of plants, which give us these grains.

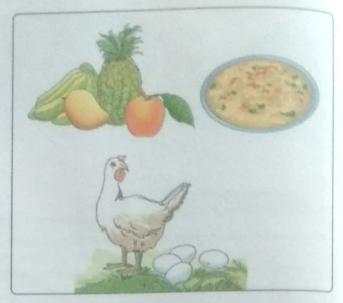


Fig. 1.2. Different types of food materials.

And then, there are food items like milk, eggs, meat, chicken, fish, prawns, beef, pork and such others, which come from animals.

Activity 1.2

Let us take the food items listed earlier and try to find out where they come from the ingredients and their sources. Some examples are shown in Table 1.2. Fill in the blanks in Table 1.2 and add more examples to this list.

Table 1.2. Ingredients used to prepare food items and their sources.

	Ingredients	Sources
Idli	Rice	Plant
	Urad dal	
	Salt	Nature
	Water	Nature
Chicken curry	Chicken	Animal
	Spices	
MARKE	Oil/ghee	Plants/Animals
	Water	Nature
Kheer	Milk	Animal
MA TO S	Rice	Plant
	Sugar	ANGEL STREET

What do we conclude from activity 1.2? Plants are the sources of food ingredients like grains, cereals, vegetables and fruits. Animals provide us with milk, meat products and eggs. Cows, goats and buffaloes are some common animals which give us milk. Milk and milk products like butter, cream, cheese and curd are used all over the world. Can you name some other animals which give us milk?

#### 1.3 FOODS OF DIFFERENT TYPES

Do human beings, animals, birds, fishes, insects, etc., eat the same type of food? The answer to this question is no. It means that, "different organisms eat different types of food". e.g. Grass may not be useful for you but it is the main food for cow, deer and buffalo.

Activity 1.3

Research work: Prepare a chart on the food habits of different animals from your near surroundings as in the format given below. Few examples are given of the type of food that some of these organisms eat. Try to find out the food eaten by other such animals. You can increase the number depending upon your knowledge or resources available to you.

100000000000000000000000000000000000000	Organism's Name	Types of Food Eaten
1.	Human beings	Vegetables, fruits, meat, pulses, milk, egg, cereals.
2.	Fish	Small aquatic plants/ animals.
3.	Cat	Rat, other small animals, milk, small birds like hen, bread.
4.	Cow	Grass, oil cake, hay, grains
5.	Tiger	***************************************
6.	Lion	***************************************
7.	Elephant	

	Organism's Name	Types of Food Eaten
8,	Butterfly	annountaining in the second
9.	Crow	minimum manusimminimi
10.	Dog	anaminimonimimimimi
11.	House lizard	namanaenaminamiamia
12.	Eagle	menonano any mandanana
13.	Owl	namanamanamanamana
14.	Bat	
15.	Earthworm	пинанининининини
16.	Deer	amannamanamanan

From your research work in activity 1.3, you can easily come to know that, "different organisms eat different kinds of food".

### Activity 1.3

Observe the table given in the activity 1.2 carefully and try to group different organisms which have the similar type of food eating habits. Make a separate table in your notebook as given in the format below. Now carefully pick out those animals:

- (i) Which eat only plant or their products (herbivores)?
- (ii) Which eat other animals (carnivores)?
- (iii) Which eat both plants and animals (omnivores)?

Few examples are solved for you. Try to find out the other animals yourself. You may take help of your classmates, teachers or elders.

S. Animals Animals No. eating pla- nts only er animal (Herbivores) (Carnivore		eating other er animals	ing both plants and animals (Omnivores)	
1.	Cow	Tiger	Human beings	
2.		***********		
3.			***********	
4.			***************************************	
5.				

Now from this activity, it can be concluded that:

- (i) The animals which eat plants and plant products such as seeds, nectar, flowers, fruits, etc., are called *herbivores*, e.g., cow, elephant.
- (ii) The animals which eat other animals are called *carnivores*, *e.g.*, lion, tiger.
- (iii) The animals which eat both plants and their products as well as other animals are called *omnivores*, *e.g.*, human beings.



- The animals which suck blood are called sanguivores e.g. leech and vampire bat.
- The animals which eat fruit diet only are called **frugivores** e.g. parrot, squirrel.
- The animals like vultures, jackals and hyenas, eat animals that are already dead and are known as scavengers.
- The organisms like fungi and bacteria that feed on dead plants and animals are called decomposers.

## 1.4 FOOD ITEMS THAT COME FROM ANIMALS

You already know that animals provide us different food products such as milk, egg, meat, honey and so on. Some animals such as lac, insects, silkworms, etc., provide us other useful products. Thus, animals have been put into various categories depending upon their utility such as:

- (i) Milk yielding animals (cow, buffalo, goat).
- (ii) Meat yielding animals (pig, hen, goat, fish, sheep, prawn, crabs, etc.).
- (iii) Egg yielding animals (hen, duck).
- (iv) Honey yielding insects (honeybees).
- (v) Fats yielding animals (buffalo, cow).

Do you know where honey comes from ? How is it produced and collected ?

Let us know in the detail about how honey is made: Honey is a sweet syrup produced by honeybees from the nectar of flowers. It contains sugar, minerals and enzymes. It is made in excess

of their needs as food for the winter. It is stored in honeycombs. Honeybees live in self made nests called beehives, when we find such a beehive, we collect the food stored by the bees as honey.



Honey has antibacterial action (antiseptic) and contains certain enzymes that help in digestion. Honey is also used to make several ayurvedic medicines.

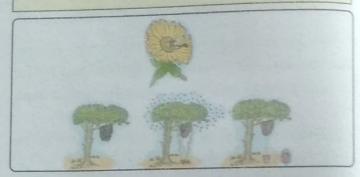


Fig. 1.3. The steps involved in the extraction of honey.



See the above figure and write down, how we can collect honey. If possible meet any farmer who is practising apiculture (rearing of honeybees) to know more about the method of honey extraction.

Activity 1.5

Until now you know much about the method of honey production and its extraction. Discuss with your classmates, about various other animal products and the anils which provide these products. One example is given for you. Make the format as given below:

	7. Type of ani- Name of the animals of mat product providing these product		
1.	Egg	Duck, hen	
2.	Meat	***************************************	
3.	Fats	************************************	
4.	Honey	***************************************	
5.	Milk	***************************************	

Do not try to test unknown plants around you to see if they are edible! Some plants could be poisonous,



#### Edible parts of a plant

In plants one or more parts can be eaten by us as food. These parts are known as **edible parts**, *e.g.*, leaves are eaten in case of coriander (dhania), mustard (sarson) and spinach (palak). Similarly, stem is eaten in case of potato,

sugarcane, ginger and onion. The parts that are not eaten or which cannot be eaten by us as food are known as non-edible parts, e.g., roots, stem and leaves of cereal crops such as rice, wheat, maize, etc.

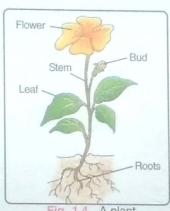


Fig. 1.4. A plant

## 1.5 FOOD ITEMS THAT COME FROM PLANTS

A large number of plants and their products are used for the well-being of mankind. Plants are the main source of food for all animals. Many plants have medicinal properties and majority of them are cultivated for food and other industrial uses. Depending upon the products obtained from plants, they are classified into various categories, such as:

- (i) Food producing plants (cereals, pulses, vegetables, fruits).
- (ii) Oil producing plants (groundnut, mustard, soyabean, coconut).
- (iii) Spices and condiments producing plants (clove, black pepper, coriander, turmeric, cinnamon).
- (iv) Sugar producing plants (sugarcane, beetroot).
- (v) Medicinal plants (neem, tulsi, cinchona, eucalyptus, belladona).

Now the question arises. Is the whole plant edible? If not, then which part is edible and which is not. Let's perform an activity to know about edible part(s) of the plant. You may take help of your classmates or elders to do this activity.

Activity 1.6

Identify the figures below and try to identify its edible part. Write down the names of some more edible parts of the plants.

**Research work**: Try to find out such plants which have two or more edible parts. Some hints are given for you in the form of a format.

S	Sketch of the	Name of	Description of
		the plant	Edible part
1.	验	Brinjal	Brinjal which is used as a vegetable is actually a fruit part of the plant.
2.		Mustard	More than one part of this plant are used as food:  (i) Seeds: They are used as spices and oil.  (ii) Leaves: They are used as vegetables 'Sarson Ka Saag' in Punjab.
3.	1		
4.	*		
5.	Nation And		
6.			

S. No.	Sketch of the plant	Name of the plant	Description of Edible part
7.	1		
8.	斧		
9.	*		

Thus, we find that, we eat leafy parts of some plants and fruits of most of the plants. Sometimes roots, sometimes stems and even flowers. Have you ever eaten pumpkin flowers dipped in rice paste and fried? Just try it!

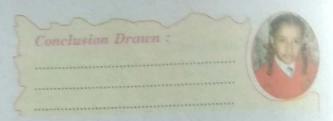
Collect information regarding the various types of plants near to your surroundings and try to categorise the food ingredients that you eat in the form of a format given below. Two hints are given for you

Activity 1.7

1.	Grains (Cereals)	Rice, Wheat, Maize, Bajra
2.	Pulses	Arhar, Urad, Moong,
		Masoor, etc.
3.	Oil	*****************************
4.	Fruits	***********
5.	Vegetables	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
6.	Medicines	han an a
7.	Spices	***************************************
8.		
9.	Others	***************************************

Now observe the products which are indicated in the tables shown in activity 1.4, 1.5 and 1.6, and draw conclusions whether plants or animals give us more varieties of food products.

Sidak wants to know about your conclusion!



From the above activities it can be concluded that, "Our food comes from different sources". We get food both from plants as well as animals. We eat entire plant as such or their products. Similarly, we eat animals (in the form of meat) as well as their different products like milk, eggs and honey.

Activity 1.8

Select the food items given in the table of activity 1.7. Identify the food items which you eat raw (as such) or uncooked. Also identify the food items which you eat after cooking. Give your feelings or opinion to Ritu on this aspect: What may happen, if pulses or cereals are eaten raw (uncooked)?

Give Your Opinion to Ritu:

Here are some of the advantages of cooked food.

- (i) It can be consumed easily.
- (ii) It can easily be absorbed by our body.
- (iii) Cooking kills the harmful germs.
- (iv) Cooked food (especially meat) can be kept for longer time.

#### Eating a nutritious food

Let us perform an activity to know, how you can make your food more nutritious!

Activity 1.9

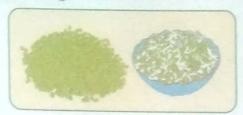
Take some dry seeds of moong or chana. Put a small quantity of seeds in a container filled with water and leave this aside for a day. Next day, drain the water completely and leave

12

CANDID INTERACTIVE SCIENCE - VI

the seeds in the vessel. Wrap them with a piece of wet cloth and set aside. The following day, do you observe any changes in the seed?





A small white structure may have grown out of the seeds. If so, the seeds have sprouted. If not, wash the seeds in water, drain the water and leave them aside for another day, cover with a wet cloth. The next day, see if the seeds have sprouted.

After washing these sprouted seeds, you can eat them. They can also be boiled. Add some spices and get a tasty snack to eat.

Fig. 1.6.



#### 1.6 IMPORTANCE OF FOOD

Food is needed by all living organisms for four main purposes.

- (i) It helps living organisms to grow:
  Food contains important nutrients in it
  which are required for the growth and
  development of body of an organism.
- (ii) It provides energy: Food is easily absorbed by our body cells to yield energy. We need energy for our all body movements such as running, walking, speaking or raising our arm.
- (iii) It is required by living organisms for replacement and repair of damaged parts: Food contains all those nutrients which are required for early healing and formation of the new skin and tissues.
- (iv) It gives us resistance against diseases and protects us from infections: Some nutrients such as vitamins and minerals help in the protection of body against

diseases and hence they are also called as protective foods.

#### Contributors of our food:

You eat your food daily but have you ever thought how food comes to us, e.g., how chapatti is made. Let's discuss about making of chapatti in detail.

Chapatti that you eat is mostly prepared by your mother. The flour for chapatti is obtained from the flour mill. The flour mill buys wheat from the local merchant or trader, who has probably purchased it directly from a farmer. This means that there are number of people who are responsible for our chapatti. In other words, they are contributors of our food.

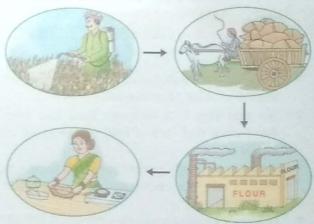


Fig. 1.7. Contributors of Chapatti,

Similarly, for every food item that we eat, there are number of persons who make their contributions. Try to find out the contributors of other types of food items also.

See the flow chart below which shows the preparation of ghee.

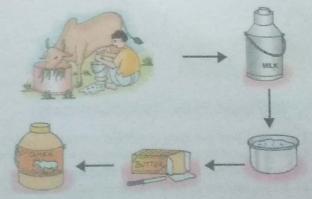


Fig. 1.8. Method of Preparation of Ghee.

Try to make similar flow charts for: Ice cream, samosa, chips and honey.

# Important Role that we can play in solving food problems in our country.

Many of the people in our country not even have enough food to eat. Even if the food is available then they do not have enough money to buy enough of it. Many of our citizens eat only one meal in a day.

Many of the people in our country suffer from those diseases which are caused by insufficient intake of food and sometimes due to lack of nutritious diet. Here are some of the ways and measures which can help in solving our food problems.

- We should try to grow surplus (excessive) food.
- We should try to find out ways and measures to prevent food spoilage (i.e., to make good storage structures).
- We should make sure not to waste food (especially at parties, marriages or religious places).
- We should try to use only those food items which are easily and cheaply available in that region.
- ☐ We should try to make more space available for agriculture (crop production).

## Let's see it again

- Food is any substance that provides an organism with nourishment.
- No one can live without food but both overeating and lack of food intake could be harmful.
- There is no single perfect food that alone can supply all the requirements for proper nutrition.
- Different people have different choices of food. There is a variety in the kind of food consumed even within a state and over various states of India.
- Different organisms eat different types of food.
- The animals which eat only plants or plant

- products such as seeds, nectar, flowers, fruits, etc., are called *herbivores,e.g.*, cow, elephant.
- The animals which eat only animals are called carnivores, e.g., lion, tiger.
- The animals which eat both plants and their products as well as other animals are called omnivores, e.g., human beings.
- Both plants and animals are useful to us as they provide many food items such as:
  - (i) vegetables, fruits, cereals, pulses, oils, sugars, spices and medicines (from plants).
  - (ii) milk, meat, egg, honey and fat (from animals).
- Our food comes from different sources.



#### A. VERY SHORT ANSWER QUESTIONS (VSAQ) :

- 1. Write at least four ways of avoiding wastage of food.
- 2. What type of food we should eat so that we have a complete diet ? Explain it.
- 3. Do you feel that food is required when we are sleeping?
- 4. Do you feel that all living organisms need the same type of food ?

#### B. SHORT ANSWER QUESTIONS (SAQ) :

- 1. What are herbivores, carnivores and omnivores ?
- 2. Why should food preservation be done.
- 3. Why is there need of a balanced diet ?
- 4. Which diet may provide us more energy: Vegetarian or non-vegetarian diet?

#### C. ESSAY TYPE QUESTIONS (ETQ) :

- 1. Give four reasons to justify this statement, 'food is very vital for our living'.
- 2. What may happen if anyone is not having his/her meals properly?
- 3. Who are the contributors of following food items: (a) Pulses (b) Meat (c) Vegetables (d) Fruits?
- 4. What are the various food items that come from animals ?

### D. ALTERNATE RESPONSE TYPE QUESTIONS (ARTQ) TRUE/ FALSE:

- 1. We can live even without food.
- 2. Food regulates our body functions only and does not protect us from diseases.
- 3. There is no single perfect food that alone can supply all the requirements for proper nutrition.
- 4. Mostly people have same choices of food.

#### E. MULTIPLE CHOICE TYPE QUESTIONS (MCTQ):

#### (i) Complete Question Form Type Questions :

- 1. Select the meat yielding animal(s):
  - (a) Pig

(b) Fish

(c) Hen

- (d) All of these.
- 2. What is the advantage of cooked food ?
  - (a) Easy to consume
- (b) Does not contain any germs
- (c) Can be kept longer

- (d) All of these.
- 3. The role of food in our body is:
  - (a) To provide energy

- (b) To protect from diseases
- (c) To regulate body functions
- (d) All of these.
- 4. This is not a part of our salad :
  - (a) Radish and carrot

- (b) Cucumber and onion
- (c) Cabbage and beetroot
- (d) Bittergourd and pumpkin.

#### (ii) Incomplete Statement Type Questions:

- 1. The animals which eat both plants and their products as well as other animals are called :
  - (a) Carnivores

(b) Frugivores

(c) Omnivores

- (d) Sanguivores.
- 2. Egg yielding animals are:
  - (a) Cow, buffalo

(b) Pig, goat

(c) Duck, hen

- (d) Camel, sheep.
- 3. Fats yielding animals are:
- (b) Cow, buffalo

(a) Fish, prawn(c) Hen, duck

(d) Honeybees.

SOURCES OF FOOD

15

4. The animals which eat other animals are called :

(a) Sanguivores

(b) Carnivores

(c) Omnivores

(d) Frugivores.

#### F. MATCHING TYPE QUESTIONS (MTQ):

#### (i) SINGLE COLUMN

The question, in this section, contains statements given in two columns which have to be matched. The statement in column-I match with only one statement in column-II.

	Column - I		Column - II		
(1)	Milk, curd, paneer, ghee, eggs	(1)	Does not provide all the nutrients that we require		
(2)	Spinach, fenugreek, carrot, turnip	(ii)	Complete diet		
(3)	Drinking only milk	(iii)	Herbivores		
(4)	Pulses, rice, chapatti, vegetables, milk, fruits	(iv)	Carnivores		
(5)	Mango, guava, apple, banana	(V)	Egg yielding animals		
(6)	Elephant, cow, deer, butterfly	(vi)	Animal products		
(7)	Lion, tiger, eagle	(vii)	Vegetables		
(8)	Cow, buffalo, goat	(viii)	Fruits		
(9)	Hen, duck	(ix)	Meat yielding animals		
(10)	Pig, hen, fish, sheep, goat	(x)	Milk yielding animals		

#### (ii) DOUBLE COLUMN

Each question, in this section, contains statements given in three columns which have to be matched. The statements in column-I are labelled A, B, C and D while the statements in column-II are labelled as p, q, r and s, and in column-III as w, x, y and z. Any given statement in column-I has one correct matching with one statement in column-III and column-III.

Column - I	Column - II	Column - III
A. Omnivore	p. Cow and buffalo	w. Cow, elephant
B. Carnivore	q. Which eat plants and plant products	x. Lion, tiger
C. Herbivore	r. Which eat other animals	y. Human being
D. Milk yielding animal	s. Which eat both plants and other animals	z. Goat and camel

#### (iii) MATRIX TYPE

Stimuli are presented vertically (in row) wherein responses are presented horizontally (in columns). Students are advised to check each cell in which the response on the top is true for each of the stimuli along the side.

			RESPONSE			
		Honey yielding insects	Fats yielding animals	Egg yielding animals	Meat yielding animals	Milk yielding animals
S	Cow, buffalo, goat					
	Hen, duck					
	Honeybees					
M U L	Buffalo, cow					
	Pig, cock, goat, fish, sheep, prawn crabs					

#### (iv) FILL IN THE BLANKS

Proper	food provides us	and pr	rotects us from .	***************************************	. The	that we	drink
usually	comes from cow a	and goat indicating	it to be an anima	al product. Honey	is obtained from	of the	flower
by hone	eybees. The sugar	which we use daily	y is obtained fro	m	The practice of	of rearing honeybe	ees is
called .						0	

#### (v) CHECK LIST

For each of the following organisms indicate their food eating habits, i.e., whether they are herbivores, carnivores, omnivores, frugivores, sanguivores.

Organism types	Food eating habits (Herbivores/ Carnivores/Omnivores/Frugivores/ Sanguivores)
Cow, buffalo, sheep, goat, elephant	
Man, dog	
Parrot, squirrel	
Vampire bat, leech	
Lion, tiger, leopard	

#### G. SELECT THE ODD ONE OUT GIVING REASON :

1.	Cow, buffalo, goat, hen.	Reason:
2.	Pig, sheep, crabs, honeybees.	Reason:
3.	Wheat, flour, chapatti, rice.	Reason:
4	Cereals pulses vegetables black pepper.	Reason:

#### SUBJECT ENRICHMENT ACTIVITY

#### A. DEBATE

- 1. Vegetarian diet is good or non-vegetarian diet.
- 2. We should prevent food wastage or our country has surplus food stocks.
- 3. Balance diet has little significance in our life.
- 4. We should prefer home made food or fast food from outside.

SOURCES OF FOOD

17

#### B. GROUP DISCUSSION

- 1. Role of food in combating diseases.
- 2. Increasing nutritive value of processed food.
- 3. Role of food in producing better citizens.
- 4. Which food is better, the one which is obtained from plants or the one which is obtained from animals?

#### C. PRACTICAL/ LAB ACTIVITY

- 1. Find out various ways and techniques which can be used to increase the food production. Ask your teacher about various techniques of food processing.
- 2. Find out the various types of vegetables and fruits which are useful for fighting against diseases.
- 3. Find out the various types of spices which are required for maintaining good health.

#### D. REASON OUT

- 1. Sprouted grains are more nutritious. [Hint : During sprouting vitamin B-complex is synthesised. Find such more reasons.]
- 2. Which is a better food habit for humans?
- 3. Scavengers and decomposers are known as nature's cleaners.



- 1. Make a list of food items generally taken by people of different regions of India. If possible, also paste the picture of those food items. Place these on a large outline map of India to display in your classroom.
- 2. Conduct a debate in your class on the topic : Which type of food items and food habits are good for the complete growth of a human being.
- 3. Broaden your horizons :
  - (1) Find out ways mean to avoid wastage of food.
  - (2) What role can you play in solving food problems in our country?
  - (3) Does everyone around you get enough food to eat, if not, why?
- 4. Try to find out the various techniques used by food industries to maintain the nutritive value of processed food.
- 5. Try to find out the various techniques used by food industries to increase the shelf life of processed food.
- Try to find out the various methods which can harm the nutritive value of food, e.g., frying damages the water soluble vitamins. Try to find out many other examples.

#### WEBLINKS

- 1. http://www.healthyeatingclub.org/info/articles/nutrients/food-source.htm
- 2. http://www.en.wikipedia.org/wiki/food#food\_sources
- 3. http://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/pyramid-full-story/index.htm1

Some most common spices.  Indian Name	English Name
	Peeper
Kali mirch	
Elaichi (chhoti)	Cardamom
Adrakh	Ginger
Lal mirch	Chillies
Haldi	Turmeric
Laung	Clones
Zeera	Cumin
Hing	Asafoetida
Lahsun	Garlic
Dhania	Coriander
Dalchini	Cinnamon
	Nutmeg
Ajwain	Thyme
Imili	Tamarind