



216en04

## METHOD OF COOKING FOOD

Cooking is being practiced since times immemorial. Do you know that the ancient man ate only raw food? Once a piece of meat fell into the fire accidentally and got roasted. The ancient man ate this piece of roasted meat and liked it. Thus began the process of cooking. It has evolved a lot since then. You find a variety of food items like roti, puri, parantha, rice, pulao, pulses, vegetable, salad, chutney, pickle, curd, butter milk, fruits, etc. You notice that boiled rice tastes different from zeera rice or pea pulao because these are cooked differently. Similarly, a chapatti tastes different from a puree or parantha, again because all these are cooked differently. Generally, vegetables like tomatoes, cucumber and fruits are best eaten raw while wheat, rice, pulses, potatoes and other vegetables must be cooked. Do you know why?

In this lesson you will get familiarized with the reasons for cooking food, different methods of cooking, their suitability to different foods and effect of these methods on food items.



### OBJECTIVES

After studying this lesson you will be able to do the following:

- explain the importance of cooking food;
- name and classify various methods of cooking food;
- elaborate on the process of each method of cooking;
- explain the effect of cooking on various nutrients present in the food;
- identify cooking practices that enhance or destroy the nutritive value of foods;
- evaluate procedures used in preparing and cooking food at home;

- convince those involved in cooking to bring about the needed changes in the *cooking process and*
- learn the importance of striking a balance between retaining the nutritive value of food and food preferences of family members.



Notes

## 4.1 IMPORTANCE OF COOKING FOOD

Think and make a list of reasons for cooking food.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

Now read about these reasons in detail.

### (i) Cooking makes food easy to digest

When food is cooked it becomes soft and easy to chew and swallow. The juices that digest food are able to mix well with this softened food and carry out the job of digestion.

### (ii) Cooking improves the appearance, texture, colour, flavour, and taste of food

Have you noticed the change in colour of carrots, beet root, spinach, peas and other vegetables on cooking? They look brighter and more attractive. The brown colour of roasted roti or parantha or toasted bread or baked cake is very tempting. When we make roti or parantha the soft sticky dough changes into a crisp roti or parantha. Its smell and taste are very inviting, too. A raw potato is not tasty but a boiled or fried potato improves not only its taste but also brings change in its texture which is more appealing.

Addition of spices and condiments while cooking helps in improving the taste and flavour of food. You have seen how the addition of salt, chillies and/or herbs, influence the taste. Thus, cooking improves the colour, flavour, texture and taste of the food and therefore the acceptability of the food.

### (iii) Cooking of food adds variety to the our meals

You must have eaten potatoes cooked in different ways. Can you name some? Yes, potato pakora, potato chat, potato parantha, potato bhujia, potato curry, potato chips and so on. Can you list a few food items that can be made with wheat flour? Yes, parantha, puree, roti, bread, mathari, etc. You can state numerous examples of dishes



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that can be prepared using any one main ingredient. In other words we are saying that cooking helps in creating variety in the food served.

Think and write about three food preparations of your region which can be made using one main ingredient.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

**(iv) Cooking helps to keep food longer**

Do you know why we boil milk? Yes, if we do not boil milk it will curdle soon. Boiling of milk helps to kill micro organisms which spoil milk and thus makes it last longer. You must have noticed that wheat dough gets spoilt after some time but chapatties or bread made out of it can be kept for much longer time. We are sure you can quote many more examples of foods that have longer shelf life because these are cooked.

**(v) Cooking makes food safe**

Micro-organisms are present in raw foods. Some micro-organisms are harmless while others are harmful. Micro-organisms that convert milk into curd are beneficial while those that cause disease like tuberculosis are harmful. Milk may contain bacteria that cause tuberculosis. These bacteria get killed when milk is boiled or pasteurized. Milk which is pasteurized can be consumed as it is. You already know the reason for this.

Pasteurization: In this process, milk is heated to a high temperature and then quickly cooled. The microorganisms in the milk are not able to withstand the sudden change in temperature and are destroyed.

Animal products like meat, fish, eggs and chicken are more likely to have harmful microorganisms and should be cooked thoroughly before eating. However, keeping the food for more than two hours at room temperature during summers can make it unsafe for consumption. Do you know why? You are right, microorganism can re-grow.

**ACTIVITY 4.1**

Observe and list the changes in the colour, texture and taste of the following food items after they are cooked. Also note the method used for cooking them.



Notes

Food item	Colour, Texture and Taste		Method of cooking
	Before Cooking	After Cooking	
Spinach			
Rice			
Arhar/ toor dal			
Potato			
Egg			

## 4.2 CLASSIFICATION OF METHODS OF COOKING

Some food items have a lot of moisture (water) in them. Leafy vegetables, e.g., spinach and fenugreek have lots of moisture. These are cooked using methods that make use of this moisture. But food items like wheat, rice and pulses are low in moisture content. These are cooked by adding extra water. There are also methods which do not require any water while cooking. In fact these help in cooking and leaving the food crisp on completion. There are many methods of cooking food. You must be using many of these methods. Can you name some?

The methods of cooking are classified as given in table 4.1.

### Classification of Methods

**Table 4.1: Methods of Cooking**

Cooking by Moist Heat	Cooking by Dry Heat	Cooking by Frying in oil or ghee
Boiling	Baking	Deep frying
Simmering/Stewing	Roasting	Shallow frying
Steaming	Grilling	
Pressure cooking		



Notes

### 4.3 DESCRIBE METHODS OF COOKING

We are sure you can describe the methods of cooking that you often use while cooking food. Of these, the most common methods are likely to be boiling, frying and pressure cooking. We will now describe the procedure of each method of cooking along with precautions, its suitability to various foods, and its advantages and disadvantages. Check if you are following the same procedure.

#### 4.3.1. Cooking by moist heat

In this method, food is put into boiling water or cooked in the steam which comes out from the boiling water. Some common ways by which you cook food by moist heat are described here.

##### (i) Boiling

Boiling is a method by which food is cooked in adequate quantity of water. For example we boil potatoes, eggs, rice and vegetables. Usually green leafy vegetables such as cabbage, fenugreek and spinach are cooked without adding extra water. Vegetables such as green peas and green beans are boiled or cooked with a little water. Cereals such as rice and pulses are boiled in large amounts of water (1.5 to 3 times). Do you know why? Yes, you are right cereals and pulses need more water to cook as they are dry and they also need more time to cook. Vegetables take less water to cook as they have higher water content.

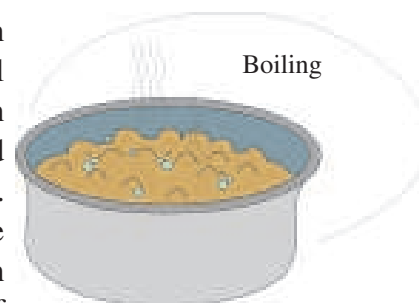


Fig. 4.1

Some points which must be kept in mind while boiling food are as follows:-

- wash the food thoroughly before boiling;
- first boil the water and then put the food;
- the water should cover the food completely;
- boil food in a pan which has a well fitted lid. This way the steam from boiling water will not go out from the pan and the water will not dry up. Food gets cooked (boiled) faster and fuel is also conserved in the process.
- do not boil food longer than needed. Once it is soft and tender, take it off the fire. If food is cooked for a very long time it loses its colour, shape and taste. Over cooking also destroys the nutritive value of food.
- potatoes and other root vegetables should be boiled with their skins on to retain their nutritive value.

**Water soluble nutrients present in food dissolve in water in which the food is being boiled. If you throw this water, nutrients will be lost. What can you do with this water? You can use this nutrient rich water to make soup or gravy for other vegetables.**

**Advantages:** Boiling is a safe and simple method of cooking also the food does not get charred. It is suitable for large scale cooking. Boiled food is also digested easily.

**Disadvantages:** While boiling, water soluble nutrients are lost if the water in which food is boiled is discarded. Some people may not like boiled food as they find it bland. The taste of boiled food can be enhanced by adding lemon or other herbs and spices.

### Let us think

- Why are certain food items boiled before they are used in a recipe?
- Why does it take longer to boil chick peas (channas) or kidney beans (rajmah) as compared to potatoes? Can we reduce the time taken to boil channa or rajmah? How?
- Name two foods which do not need boiling before cooking, two which need boiling before cooking and two which can be cooked either way.

## (ii) Simmering or Stewing

Stewing is cooking food in a small quantity of water kept below boiling point and for a long time. Once boiling starts, the flame is lowered and the food is allowed to cook slowly. The food and the liquid in which it is cooked are served together.

Have you used this method of cooking food in your house? Yes you are right. When you cook dry and hard foods like pulses, meat and even vegetables in dry form you are using this method.

**Advantages:** In stewing, the juices of the food are retained and the food tastes good. The nutrients are also conserved better.

**Disadvantages:** Food takes longer to cook.

## (iii) Steaming

When food is cooked with the heat from water vapours, it is called steaming.

How do you steam food? Well, you keep food in a pan in such a way that it comes in contact with steam from the boiling water. Look at Figure 4.2. The big utensil with a lid is the steamer. It consists of two pans and a tight lid.



Fig. 4.2

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## Notes

The lower pan contains water, the pan above this has tiny holes on its base and the food is kept in it. A tight fitting lid covers this food. When water boils in the lower pan the steam comes into the upper pan through holes and cooks the food kept here.

If you do not have a steamer can you devise one? Yes, definitely. Heat water in a pan which has a tight fitting lid. Cover this pan with a clean muslin cloth. The cloth should be of optimum size and should not get in touch with fire. Put food on this cloth and cover it with a tight fitting lid. Your steamer is ready and working.

Have you seen an idli maker? This is also a steamer. Idli batter is put in the idli mould which has tiny holes. This mould is then lowered into a container with a little water at the bottom. The idli maker is then kept on fire. When water boils steam is produced. Once again it is the steam which passes through the holes in that mould and cooks the idlis. Steaming can be done for both solid and semi-solid foods. You can cook momos, khaman, dhokla and caramel custard in the same way.

**Advantages:** Steaming shortens the duration of cooking and helps to conserve nutritive value, colour, flavour and palatability of food. Steamed food is light, nutritious and easy to digest. Such foods are especially good for people who are sick or people with weak digestion or for the elderly. Young children also can be served steamed food.

#### (iv) Pressure Cooking

Pressure cooking is a process of cooking in a special utensil which allows cooking with a lot of steam under pressure. Pressure cookers are made of steel or from a mixture of aluminium and other metals and can withstand high pressure. The steam produced is trapped inside the cooker thus increasing the pressure and temperature above 100°C. Rice, pulses, meat, potatoes, roots, beans, and peas are cooked well in a pressure cooker in the shortest possible time.

It is important to remember that once the pressure cooker develops optimum pressure the excess steam is released through the weight kept on its lid. One should lower the flame under the pressure cooker at this time. This maintains the pressure and avoids fuel wastage. We must also remember to clean the weight regularly as it has tiny holes which get blocked with food. This prevents the escape of excess steam built up in the pressure cooker which can lead to the bursting of the pressure cooker and causing severe injuries. You must also check the rubber gasket of the pressure cooker as it creates a seal because of which steam is trapped.

**Advantages :** Pressure cooking kills all bacteria and hence the food is safe and hygienic to eat. The food gets cooked faster i.e. almost in 1/3<sup>rd</sup> time than boiling. This also saves the fuel. Several foods can be cooked together in the pressure cooker by using separators. It is not necessary to immerse food in water while cooking and this reduces the loss of water soluble vitamins and minerals.

**Disadvantages:** If food is cooked for very long, it loses its texture and may even burn.



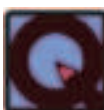
**ACTIVITY 4.1**

Your friend's family loves to eat boiled rice and dal. Rice has to be boiled with lots of water and the extra water is thrown away. You know that throwing this water means we throw away the soluble nutrients present in rice.

Why is it necessary to break this habit?

Why does the family refuse to change?

How can this problem be solved?

**Fig. 4.3****Notes****INTEXT QUESTIONS 4.1**

1. List four advantages of cooking food.
  - (i) \_\_\_\_\_
  - (ii) \_\_\_\_\_
  - (iii) \_\_\_\_\_
  - (iv) \_\_\_\_\_
2. Choose the best option from those given below:
  - (i) A method of cooking where food is cooked without coming in contact with water is called \_\_\_\_\_.
    - a) steaming
    - b) boiling
    - c) stewing
    - d) pressure cooking
  - (ii) Of the four methods of cooking food with moist heat, the one method which preserves the maximum nutrients is called \_\_\_\_\_.
    - a) steaming
    - b) boiling
    - c) stewing
    - d) pressure cooking





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(iii) Stewing is characterized by \_\_\_\_\_.

- a) high temperature and lots of water
- b) high temperature and little water
- c) low temperature and little water
- d) low temperature and lots of water

(iv) Pressure cooking is done at \_\_\_\_\_.

- a) above 100 degrees
- b) below 100 degrees
- c) 100 degrees
- d) any of the above temperatures

### 4.3.2. Cooking by dry heat

We all like to eat khakhra, peanuts, bread, buns, cakes and rusks. Do you know how these are cooked? Yes all these are cooked by dry heat which is usually hot air. The temperature used is as high as 200-300°C. Dry heat cooking gives a crisp texture, brown colour and pleasant flavor to the foods.

There are three ways of cooking food by dry heat.

- a) Baking
- b) Roasting
- c) Grilling

Let us learn about these.

#### (i) Baking

Baking is the method by which food is cooked by placing it inside a heated closed box called an oven. The air inside the oven gets hot due to fire lit at its base or with electricity and the food gets cooked by hot air, when placed inside. Have you seen a bakery in your neighbourhood? You must have also seen the big ovens which are heated by fire produced by coal or wood and which are used to bake roti, naan, pav, buns, biscuits, breads and pastries. These ovens are also known as 'bhattis'.

You can easily make an oven at home. Take a kadhai or a thick walled vessel that will retain heat well. Put a layer of sand in it and fit it with a lid. Heat this over coal, kerosene



Fig. 4.4

or a gas stove. Once it becomes hot, put the food inside and close the lid. Place the tin or kadhai on a low fire. Bake food till it is light brown in colour. Do not open the lid very frequently because the hot air from inside will escape and make the food dry and hard.

**Advantages:** Food cooked using this method adds a variety to the texture in our plate.

Remember some baked products may be high in calorie content like cake and pastries. etc.



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## (ii) Roasting

Another method of cooking food by dry heat is roasting. While roasting, the food is put directly on a hot tava or girdle or sand or fire and cooked.

Vegetables like brinjals, potatoes and sweet potatoes, can be roasted and so do grains like maize and chick peas. Nuts like ground nuts, cashew nuts and foods like papad, khakhra and meat are also cooked by this method. We are sure you have roasted many of these foods. Which foods do you usually roast at home? One of them would have been brinjal.

Well while roasting brinjal you must have placed it directly on the fire and must have kept on turning it every now and then so that all sides get roasted. How did you know that your brinjal is roasted and ready?

Have you seen grains or maize or chick peas or peanuts being roasted? How is that done? Yes you are right. These are roasted in hot sand placed in a huge vessel like a karahi. The food is stirred all the time for even distribution of heat. Tandoor is a kind of oven made of clay and used for roasting rotis, naans, paneer and chicken.

Find out how else roasting is done.

**Advantages:** Food is tastier when cooked this way. It also adds variety to a meal.

**Disadvantages:** It is a relatively slow method of cooking. Roasted food sometimes is too dry, therefore, it may be served with a chutney or sauce.

## (iii) Grilling

Grilling is cooking over a glowing fire and uses more indirect heat and is slower than roasting. The food is supported on an iron grid over the fire, or between electrically heated grill bars. The grill bars are brushed with oil to prevent food sticking and can be heated by charcoal,

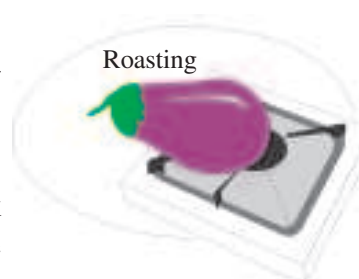


Fig. 4.5



Fig. 4.6



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gas or electricity. The food is cooked on both sides to give a distinctive flavour. Potato, sweet potato, brinjal, chicken and fish can be grilled. You have eaten bati chokha, chicken and paneer tikkas and kababs. All these foods are cooked by grilling.

**Advantages:** Grilling like roasting also gives nice flavor to the food. You can prepare a variety of dishes using this method.

### 4.3.3. Frying

Frying is the process of cooking food in hot ghee or oil. Food can be cooked either by shallow frying or by deep frying. Shallow frying means frying in little oil and deep frying means immersing food fully in hot ghee or oil. You must have cooked foods using both these methods. Name some food items which you cook at home using these methods and write in the table given below.

Table 4.2

	Shallow frying	Deep frying
1		
2		
3		

### Deep frying

Several Indian foods are cooked using frying. These include foods like bhajias, pakodas, samosas, vadas and kachoris. Deep frying is carried out by dropping food in well heated ghee or oil in a kadahi. The food should fully dip in ghee or oil. A few pieces of food should be added at a time. We should avoid using large quantity of oil or ghee for frying. Overheating of ghee or oil while frying should be avoided.

After frying, cool the oil and store the leftover oil in a covered container to prevent any decomposition. Avoid repeated use of the same oil for frying.

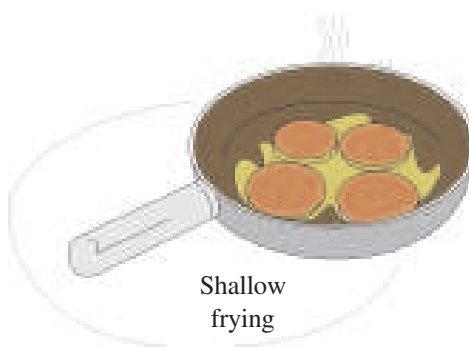


Deep frying

Fig. 4.7

## Shallow frying

How will you shallow fry the food? What precautions will you take while shallow frying? Yes, you are right. Use as little oil as possible and control the heat. Turn the side of the food when needed and apply oil if needed again. Non-stick pans are good for shallow frying. As they need very little oil to fry.



Shallow  
frying

Fig. 4.8

### Some precautions while frying food:

- (i) food should be cut into even sized pieces to ensure even cooking;
- (ii) the (ghee or oil should be heated well and then the flame or heat should be reduced a little;
- (iii) a few pieces of food should be put at one time as adding a lot of food may lower the temperature of fat and increase fat absorption;
- (iv) fried food should be placed on a clean, absorbent kitchen napkin or brown paper;
- (v) all the pieces of food should be removed from the oil or ghee to avoid burning of these food pieces and spoiling of the ghee or oil;

**Advantages:** Fried food has longer life than food cooked using other methods;

**Disadvantages:** Fried food especially deep fried food is difficult to digest and has many calories, too. Excessive consumption of fried foods can be bad for health.

## 4.3.4. Other Methods of Cooking

- (i) **Microwave Cooking:** It is a comparatively new method of cooking and gradually becoming popular. In this method food is cooked by microwaveradiation. Water molecules in the food vibrate rapidly due to microwaves. The heat generated in the process cooks the food.

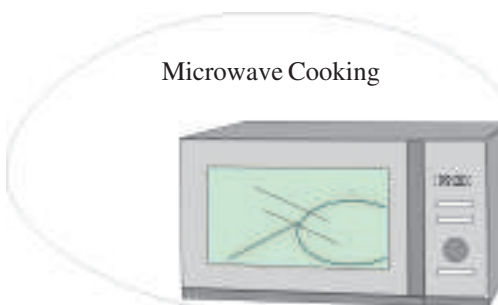


Fig.4.9

### Advantages:

It is a quick method of cooking. Cooking time is reduced significantly as compared to other methods of cooking.

### Disadvantages:

- (i) It uses electrical energy and therefore may not be useful in places where continuous electric supply is not available.



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(ii) It may dry up the food products.

(iii) **Solar Cooking:** A solar oven or solar cooker makes use of sunlight as its source of energy. Box type solar cookers are useful for a family while panel type solar cookers can be used for community or large scale cooking.

### Remember

While using a microwave, remember to open a microwave a few seconds after it has stopped. This will decrease your exposure to radiation.

### Advantages:

- (i) A solar cooker does not produce smoke. It has low maintenance and practically no running cost.
- (ii) It is an environment friendly method of cooking food.
- (iii) Solar cooking can be successfully done in many parts of India.

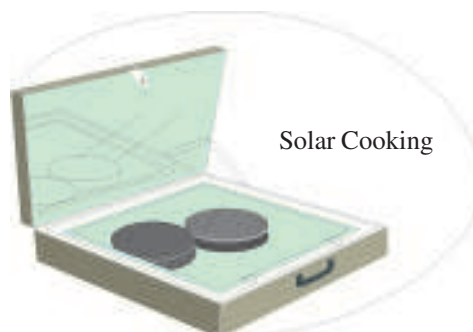
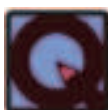


Fig.4.10

### Disadvantages:

Solar cooker is used outdoors and works only when there is plenty of sunshine.



### INTEXT QUESTIONS 4.2

1. Fill in the blanks with appropriate words.
  - i) The method of cooking food in an oven is called .....
  - ii) When sunshine is used for cooking it is called.....
  - iii) The process of cooking food in hot sand is called .....
  - iv) ..... is a method of cooking where food is cooked in a closed box which is heated on gas or coal or using electricity.
  - v) When food is cooked on direct flame the method is called .....
  - vi) Cooking on hot tawa is called .....
  - vii) Cooking food in hot oil is called .....
  - viii) ..... is a method where heat is generated in the food by rapid vibrations of water molecules.
  - ix) In ..... the temperature used is as high as 200-300°C.



Notes

2. Write two differences between baking and roasting.

Differences

- i) .....
- ii) .....

3. Write two differences between shallow frying and deep frying.

Differences

- i) .....
- ii) .....

4. State one advantage and one limitation of solar cooking.

.....

.....

5. Gauri is cooking *sooji halwa*. The recipe is given below. Identify the methods of cooking used while making the *sooji halwa*. Write in the space provided.

Steps for preparing the *Sooji Halwa*:

1. Add sugar to water and mix well and prepare a solution while heating

.....

2. In a *kadai* (vessel) take a little ghee and sooji and cook for 3 minutes

.....

3. Add more oil/butter and cook for 20 minutes on medium heat, till the sooji turns brown

.....

4. In a *kadai* (vessel) add cardamom powder, raisins, grated almonds, water and sugar solution slowly, stirring continuously with a spoon and allow water to evaporate for 5-7 minutes

.....

5. Garnish with a grated almonds.



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## 4.4 LOSSES OF NUTRIENTS DURING COOKING

Food can lose its nutritive value in the process of cooking. Correct methods of preparation and storage must be used to preserve nutrients. Let us understand how these losses occur.

### (i) Vitamin A:

It gets oxidized when it reacts with oxygen present in the air and gets destroyed. Cooking at high temperature in an open pan results in food coming in contact with oxygen for a long period of time and this brings about a reduction in vitamin A content.

You have already learnt that Vitamin A is a fat soluble vitamin. It gets dissolved in fat when foods like spinach or fenugreek (*methi*) are deep fried. Temperature as high as 300°C is reached during deep frying which destroys vitamin A rapidly. While preparing carrot potato vegetable, cook in a covered pan in order to prevent the loss of vitamin A.

### (ii) Vitamin B Complex

It is a group of eight water soluble vitamins. They are generally found together in most foods and share certain properties in common. Vitamin B gets dissolved in water when these foods are washed, soaked or cooked in water. If this water is discarded, it results in the loss of Vitamin B.

Rice, pulses and some vegetables are the main sources of vitamin B complex in our diet and therefore care should be taken while washing, soaking and cooking these foods.

Another reason for the loss of Vitamin B complex from our food is the addition of cooking soda to the food during the process of cooking. Therefore use of soda while cooking food should be avoided.

Milk is a good source of Riboflavin also called Vitamin B<sub>2</sub>. It gets destroyed when milk is exposed to sunlight (due to ultraviolet rays). In order to preserve Vitamin B in food, exposure to sun light should be avoided.

### (iii) Vitamin C

It is another water soluble vitamin which is easily destroyed by heat and oxidation. When you cut vegetables and fruits rich in vitamin C and leave them exposed to air for a long time before cooking or eating it, some of the vitamin is lost. Vitamin C is also lost when you wash vegetables and fruits after cutting or if you cut them too fine.



When food rich in vitamin C are cooked for a long time or cooked with soda most of vitamin C is lost. This vitamin is also lost when the water in which the food is cooked is thrown away. Therefore, proper care during cutting, washing and cooking of vitamin C rich fruits and vegetables should be taken. Citrus fruits and vegetables (sour and juicy) have this vitamin in plenty and we can conserve it.

#### (iv) Proteins

Cooking results in softening of proteins in foods such as egg, fish and meat. All proteins present in the food items absorb water and get coagulated by heat. If the coagulated protein is further heated, it loses moisture and becomes dry and rubbery. It also becomes difficult to digest.

Addition of acidic ingredients like lemon juice, tomatoes, curd or tamarind juice increases cooking time and makes the protein tough and leathery. These substances should be added towards the last stage of cooking.

When protein rich foods like milk are cooked with sugar for a long time (for example, while making kheer or rabdi) the sugar and protein react to form a brown coloured compound and the quality of protein deteriorates.

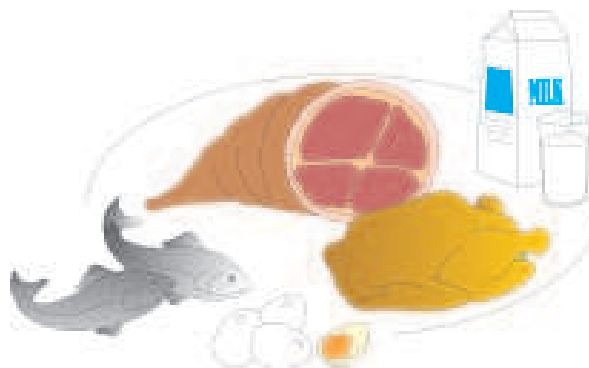


Fig.4.11

#### (v) Oils and Fats

Oil and ghee are used for cooking and frying of foods. During frying the oil or ghee is heated to a high temperature i.e.  $300^{\circ}\text{C}$ . Repeated use of oil for frying is quite a common practice but must be discouraged because when ghee or oil are heated for long periods of time over and over again, their quality becomes poor.

Remember: Repeated use of the same oil or ghee as a cooking medium should also be avoided. You should keep changing the cooking oil used in your kitchen. You may choose any of the oils like groundnut oil, vegetable oil, sunflower oil or soyabean oil. You have already learnt that once oil or ghee has been used for frying it should be allowed to cool and then sieved and stored in a covered container.



Fig.4.12



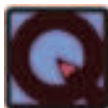
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### (vi) Minerals

Minerals like sodium and potassium dissolve in water. Minerals get lost when food is first cut and then washed and the extra water in which they are boiled, is thrown away. Hence, we should not throw away water in which food has been cooked. While cooking, we should wash vegetables and fruits before cutting.



### INTEXT QUESTIONS 4.3

1. Write true (T) or false (F) against each statement.
  - (i) Cooking soda has no harmful effect on nutrients present in food that is being cooked. ....
  - (ii) Minerals are lost when the water in which the foods are cooked is thrown away.....
  - (iii) Maximum loss of nutrients occurs when food is pressure-cooked. ....
  - (iv) Vitamin C gets easily destroyed during cooking. ....
2. You are served the following - (i) boiled potato raita (ii) potato chips (iii) potato pakora (iv) roasted potato  
 Answer the following questions with reasons.
  - (i) Which dish would have least nutrients?
  - (ii) Which dish would be suitable for a nine months old baby?
  - (iii) Which dish would take the least time to cook?

Note : There may be more than one answer for each question.

### 4.5 CONSERVATION OF NUTRIENTS

Conservation of nutrients means saving nutrients during the process of preparation and cooking of food. We can conserve nutrients in food items by following some simple practices:

1. Wash vegetables before cutting them so that minerals and vitamins are not destroyed. Wash them only as much as necessary.
2. Scrape the peels of vegetables as thin as possible because vitamins and minerals are found just under the skin of the vegetables.
3. Cut vegetables into large pieces just before cooking. Small pieces mean greater loss of nutrients.

4. If vegetables are to be cooked in water, put them into boiling water.
5. Use just enough water for cooking. Do not throw away the extra water. Use this extra water to cook some other food.
6. Do not use cooking soda while cooking.
7. Use of tamarind or lemon juice during cooking helps to conserve the vitamins.
8. Cook rice in just enough water which gets absorbed during cooking.
9. Cook in a pan which has a well fitting lid. When you cook in an uncovered pan most of the nutrients are lost.
10. Do not overcook the food as many nutrients will be destroyed.
11. In order to preserve nutrients, use a cooking method which cooks food the fastest.

**ACTIVITY 14.2**

Lesson 4 discusses the common nutritional problems affecting large number of people in India. The most common ones are anemia (caused due to iron deficiency), goitre (caused due to iodine deficiency) and night blindness (caused due to vitamin A deficiency). Fortification is the technique of adding specific nutrients to a food (called the carrier) in order to overcome the commonly seen deficiency disorders. One such example is **Iodised Salt**. The symbol of smiling sun helps you identify the iodized salt. Similarly there are other products that are fortified with specific nutrients. Visit a grocery shop or mall in your neighbourhood. Carefully read the nutrition labels on cooking oil containers, wheat flour and biscuit packets. Note the nutrients added to them. Do they carry a special symbol?

**4.6 ENHANCING NUTRITIVE VALUE OF FOOD ITEMS**

You are now familiar with the different methods of cooking and ways that help us to conserve nutrients while cooking. It would be brilliant if we could increase the nutritive value of food items without increasing the cost. Can you suggest some ways of doing so?

The process of improving the nutrients in food items by special methods is called **Enrichment or enhancement of nutrients**.

You must understand the purpose of enhancing the nutritive value of food. It helps to—

- provide food which can meet the nutritional requirements of the body;
- provide opportunity for proper selection and preparation of food items;
- provide an opportunity for balanced food;

**Notes**



- improve the flavour and texture of the food;
- make available a variety in food;
- assist in planning the daily menu, keeping in mind the content of the nutrient in the food;
- prevent deficiency diseases in the body; and
- develop good food habits.

#### 4.6.1. Methods of Food Enrichment

We can enrich the foods using the following simple methods:

- i) Combination
- ii) Fermentation
- iii) Germination

Let us learn more about these methods.

##### (i) Combination

No single food provides us all the nutrients. Hence, we eat a variety of food. For example, we eat roti with vegetables and rice with dal. We include salad, curd, buttermilk chutney, pickle and papad, too, in our regular meals.

Combining foods from different food groups is the easiest way of eating all nutrients. Similarly we can also combine a number of food items in one dish and get all the nutrients from it. Khichadi, dhokla, missi roti are a few examples where we are combining ingredients from different food groups. Such a combination of food items improves the quality of nutrients. Do you know how this happens? Here are some examples.

You know that cereals lack certain amino acids. And these are present in pulses. When a pulse and rice are combined, the quality of proteins becomes as good as that of milk. Ideally cereals (rice, wheat, jowar, bajra and maize) should be combined with pulses, nuts and oil seeds like groundnuts, sesame seeds and milk products to get a good quality protein in our diet. Similarly vegetables like spinach, fenugreek and carrots are rich in vitamins and minerals. These when added to a meal can further enhance the nutritive value of food.

**Advantages:** The quality of a meal is improved without increasing the cost by combining two foods selected from same or different food groups. It is a simple technique that can be followed in every household.

##### (ii) Fermentation

Fermentation is a process in which micro-organisms present in the food or added in the form of curd or yeast, change nutrients already present in the food, into simpler and

better form. In this process some new nutrients like Vitamin C and B complex are also created.



Fig.4.13

Can you name some fermented foods? Yes, curd, bread, khaman, dhokla and idli are all examples of fermented food items.

Have you ever made bhaturas? These are made by mixing a little curd in maida (refined flour) which is kneaded into dough and kept covered for a few hours. During this time the dough rises. Do you know why? When you add curd to maida you introduce micro-organisms which begin to grow at a very fast rate. They start a process called fermentation which makes the dough rise and become almost double in quantity.

Similarly, idli is prepared by auto fermentation where microorganisms present in rice and pulse cause fermentation and the batter rises. During fermentation the micro-organisms use up some of the nutrients present in the batter and change them into better quality nutrients. They also produce additional nutrients like vitamin B-complex and vitamin C which were not present in the food earlier. These are two examples of fermented food.

### Advantages

- a) Fermentation improves the digestibility of food items. The micro-organisms which cause fermentation break the proteins and carbohydrates into smaller parts, which are easier to digest.
- b) Fermented foods become spongy and soft and thus become, specially, useful for young children and elderly people.

### (iii) Germination

Take some whole 'moong' or 'channa' and soak it overnight in a sufficient quantity of water. What do you see the next day? Yes, they become big in size and soft to touch. Now drain the water thoroughly and tie or wrap the soaked grains in a wet cloth and keep for another 12 to 24 hours, you will notice that small white shoots have started growing from these grains. This process is called germination or sprouting.

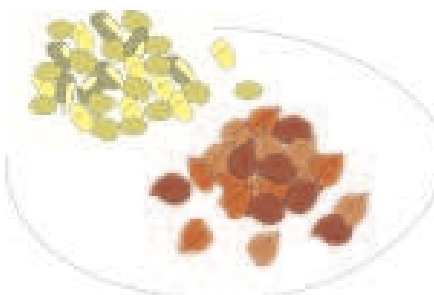


Fig.4.14



Notes



### Notes

Grains like wheat, bajra and jawar can also be sprouted. These grains can then be dried in shade and roasted lightly on a heavy bottom pan. They can be grounded and used in preparing supplementary food items for young children and elderly people. Pulses like moong, peas and black grams are also sprouted first and then steamed and eaten after adding salt, chilli powder, lemon juice and chat masala.

The time and water which each grain or pulse or legume needs for soaking and sprouting is different. Normally 8-16 hours are needed for soaking and 12-24 hours for sprouting depending upon the season. The cloth in which the soaked grains is tied should be kept moist all the time.

### Advantages

- i) It increases digestibility of foods because some carbohydrates and proteins are broken down into smaller and easily digestible forms.
- ii) It increases the nutritive value of food with no additional cost. You have already learnt how this happens.



### INTEXT QUESTIONS 4.4

1. Arrange the following steps of cooking in the right order by putting a sequential order of 1, 2 ... against each step.

Order

- |                                       |       |
|---------------------------------------|-------|
| a) watch the time while cooking       | _____ |
| b) wash the vegetables                | _____ |
| c) cook in covered pan                | _____ |
| d) peel the vegetables thinly         | _____ |
| e) cut the vegetables into big pieces | _____ |

2. Write three ways of preventing nutrient loss while cooking green vegetables.

.....

.....

.....

### 3. Fill in the blanks

- i) Combination of food items is important since no food supplies.....  
.....the nutrients.
- ii) Combining food items is beneficial where ..... money is available.
- iii) Germination increases the nutritive value and ..... of food items.



Notes

4. In Column I are listed three ways of enhancing the nutritive value of food items and the Column II contains the reasons for this improved quality. Match the method with appropriate reason.

Column I	Column II	Reasons
a) Combining	i) increases vitamin content due to activity of microorganisms	
b) Fermenting	ii) increases the vitamins	
c) Germinating	iii) improves quality due to different items eaten together	
	iv) increases the acidity of food	

5. You made arhar dal and rice for the lunch. You can also cook the same dal by mixing moong and spinach in it. Which meal is now more nutritious and why? Will this change be acceptable to your family? If not then what will you do?

Your family loves to eat 'aalu tikki' (potato cutlets) which are deep fried. If you made this snack using shallow frying and served them with channa and chutney. Will the change be acceptable?



### TERMINAL QUESTIONS

- List five advantages of cooking food?
- Name two methods of cooking food for the following:
  - Long cooking time
    - 
    -
  - Short cooking time
    - 
    -
- Dolma prepared cabbage salad for herself, whereas Mohan cooked cabbage for his meal. Who got more vitamin C from the cabbage?
- Saraswati is cooking spinach in her kitchen. She chopped the spinach finely, washed it thoroughly and shallow fried it in an open pan. Do you think she cooked it the right way? Give reasons for your answer





Notes

5. How do the following improve the nutritive value of foods?
  - a. Fermentation
  - b. Germination
5. Match the food items given in column I with the method used in cooking it from the column II.

### Column I

#### Cooked food

- (i) Dhokla
- (ii) Dal
- (iii) Puri
- (iv) Parantha

### Column II

#### Method of Cooking

- (a) Simmering
- (b) Deep-frying
- (c) Shallow frying
- (d) Steaming
- (e) Boiling



## ANSWERS TO INTEXT QUESTIONS

### 4.1

1. Refer text
2. (i) c      (ii) a      (iii) b      (iv) a

### 4.2.

1. i. baking    ii. solar cooking    iii. roasting    iv. baking  
v. grilling    vi. baking    vii. frying    viii. microwave cooking    ix. dry heat.

### 2.

#### Baking

- (i) Food is placed inside a closed box called oven.
- (ii) It is used for making bread biscuits, cakes, etc.

#### Roasting

- (i) Food is put directly on the hot tava, hot sand or hot fire.
- (ii) It is used for roasting channas, brinjal, maize etc.

### 3.

#### Shallow frying

- (i) little oil is smeared on the food.
- (ii) Tava or frying pan is used for frying

#### Deep frying

- (i) food should fully dip in ghee/oil
- (ii) Karahi is used for frying



**Notes**

4. Refer text
5.
  1. boiling
  2. roasting
  3. stewing
  4. frying

**4.3**

1. (i) False      (ii) True      (iii) False      (iv) True
2. (i) Potato chips, potato pakora  
(ii) Potato raita, baked potato, roasted potato  
(iii) Potato baked in microwave oven.

**4.4**

1. b) 1      (d) 2      (e) 3      (c) 4      (a) 5
2. Refer text
3. (i) All  
(ii) Less  
(iii) Digestibility