

MODULE - 2

Foods and Nutrition



Notes



8

PREPARATION OF FOOD

We all cook food at home. We enjoy eating food that is cooked in different ways. Take a food item like wheat flour. What will happen if we eat only ‘chappatis’ made out of it? We will get bored of eating the monotonous food everyday.

So, variety is brought into the food by preparing ‘parantha’ or ‘puri’ from the wheat flour. Similarly, a meal is prepared by using different methods of cooking. For example, a menu of dal, rice, puri and kheer involve a different method of cooking them. This way, cooking helps us in making meals interesting.

A food item goes through various stages of preparation before it is cooked. If we go wrong in these steps of cooking the final product will not be as expected. Thus, food preparation is not only an art but a science too. In this lesson, you will learn to use various methods of pre-preparation and preparation of food and also learn about the changes that occur in the food during its preparation.



OBJECTIVES

After reading this lesson, you will be able to:

- explain the meaning and importance of pre-preparation and preparation of food;
- list and discuss the salient features of four major methods of cooking;

- relate nutrient loss to method of pre preparation and cooking;
- suggest ways of enhancing nutritive value of food.

8.1 NEED FOR COOKING

We all like to eat cooked food. Have you ever thought why food should be cooked and then eaten? Here are some reasons for cooking food before it is eaten.

- Food becomes tender, soft and easier to chew and digest
- Heat destroys harmful micro-organisms making the food safe and sterile
- Cooking improves the appearance and enhances the flavour of many foods
- Digestibility of starchy foods is enhanced through release of starch from cereal grains
- Through cooking you can create variety in your meals.


Notes

8.2 PRE-PREPARATION OF FOOD

Let us see what goes into making the dishes different and tasty from one another. We can achieve varied effects in the foods by performing different activities on them. For example, a washed carrot or cucumber is tasty to eat, but a washed, peeled and sliced carrot or cucumber sprinkled with salt-lemon will taste even better. You can cook potatoes whole, with their skin on or after peeling and cutting them into pieces. Here, the activities like washing, peeling, slicing are examples of pre-preparation.

Activities by which food becomes ready to be cooked is called pre-preparation.

Some of the pre-preparation activities are as follow:-

- Blanching - Removing skin by putting food in boiling water and then in cold water.
- Washing - Cleaning food with water.



Fig. 8.1 : Washing



Fig. 8.2 : Cutting

- Cutting - Pass a knife through in order to produce pieces.

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Preparation of Food

- Peeling - Remove skin using a knife/peeler.
- Mashing - Breaking a soft food into a paste.



Fig. 8.3 : Peeling



Fig. 8.3 : Peeling

- Grating - Breaking food in very small pieces using a grater.
Shredding - Cutting food into very fine pieces.

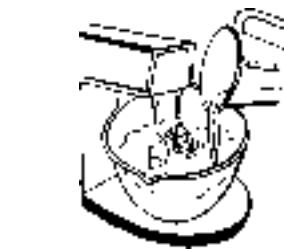


Fig. 8.4 : Grating



Fig. 8.5 : Grinding

- Grinding - Breaking food into powder/paste using grinder.
- Steeping - Soaking food in liquid.
- Sieving - Separating/removing larger pieces from small ones.

- Mixing - Putting different foods together.

Fig. 8.6 : Mixing

It will be fun to find out about more such terms used for pre-preparation of food and defining them.

Each food item requires different pre-preparation activities depending upon its end-use. For example, coriander leaves undergo different activities for different end uses.

For Green Garnish - Coriander is plucked, cleaned, washed and chopped finely;

For Chutney - Plucked, washed and ground to a fine paste.

Similarly, for making chips, potato needs to be: Washed → peeled → thinly sliced.

For making tikki, potato needs to be: Washed → boiled → peeled → mashed



Activity 8.1: Observe your mother in the kitchen and list the activities she performs on the following before cooking them:



Notes

Sl.No.	Channa Dal	Cauliflower	Spinach
1.			
2.			
3.			
4.			
5.			
6.			

8.3 PREPARATION OF FOOD

After undergoing the various pre-preparation activities, the food is ready to be cooked.

Once the food has undergone prepreparation, the process of subjecting it to the action of heat is termed as cooking.

There are many methods of cooking i.e., applying heat to the food. You may observe that the manner in which heat is applied to the food determines the type of cooking method used. Here is our list of various methods of cooking.

Methods of Cooking		
A) Moist Heat	B) Dry Heat	C) With fats
1. Boiling	1. Grilling	1. Deep frying
2. Simmering	2. Roasting	2. Shallow frying
3. Poaching	3. Baking	3. Sauteing
4. Stewing	4. Puffing	4. Dry frying
5. Steaming		
Direct	Indirect	Pressure Cooking
D) Microwave cooking	E) Solar Cooking	

Now, you must know the special points about each method because these will help you to decide which method to select for cooking a particular food or to get a specific result.

**A. Moist heat**

- 1. Boiling** - Food is immersed in sufficient amount of hot water and heated to its boiling temperature (100°C or 212°F) The temperature is maintained till the food is cooked. For example while boiling potato you see that hard potato becomes soft when you allow it to boil for some time. You can boil almost any food which is hard/tough to make it soft.

Points to remember

- Boil food along with their skin to minimize losses of nutrients
 - Boil in covered utensils to minimize losses due to evaporation
 - Avoid excessive boiling because it can disintegrate the food.
- 2. Simmering** - Food is cooked in water as the medium and providing heat below boiling temperature, that is, $95^{\circ}\text{--}98^{\circ}\text{F}$. For example, Kadhi and kheer are prepared by this method. Since the heat is low you do not need too much water.

Points to remember

- Do not bring the food to boiling temperature
 - Do not cover the food while cooking, so that the temperature does not rise.
- 3. Poaching** - Cook the food in minimum amount of liquid at temperature just below the boiling point.

It is used for cooking fish, eggs and fruits because these food do not require long cooking. Add a pinch of salt and few drops of vinegar to cooking liquid for a clean smooth edge while making poached egg.

- 4. Stewing** - It is a gentle method of cooking in a pan with a lid. Food is simmered (98°C) in small amount of liquid. Steam generated in the pan helps in cooking and softening the food.



Fig. 8.7 : Stewing

Points to remember - A stew boiled is a stew spoilt! It is used in cooking less tender cuts of meat, vegetables, fruits, eg., - apple, peach.

- 5. Steaming** - The steam generated by water is used as a medium of cooking. Food does not come in direct contact with water.

It is achieved through following three methods.

Direct Method

Food is kept in the sieve or muslin cloth on top of the pan containing hot boiling water. The steam generated from water in the pan cooks the food. Special steamers are also available. Used for peas, idli, fish and soft vegetables



Fig. 8.7(a)

Indirect

Food is placed in smaller closed container in the pan containing boiling water. The heat of steam surrounding the smaller container cooks the food.



Fig. 8.7(b)

Pressure Cooking

It is based on the principle that more heat is generated under pressure than otherwise, thereby reducing the cooking time.



Fig. 8.7(c)



Notes

Pressure cooking is one of the ideal methods due to its shorter cooking time, better nutrient retention and palatability. It also economizes on fuel, time and effort.

Points to remember

- Do not overfill the pressure cooker. Fill only upto two-third of the volume.
- Take care of rubber gasket, vent pipe and the safety valve. Change immediately, if damaged.
- Lower the flame on the first whistle.
- Do not try to open the lid immediately after removing from fire.



INTEXT QUESTIONS 8.1

1. Give one similarity and one difference between
 - i) Stewing and Simmering.....
 - ii) Peeling and Blanching.....
 - iii) Shredding and Grating.....
 - iv) Grinding and Mashing.....



2. Give five reasons for cooking.

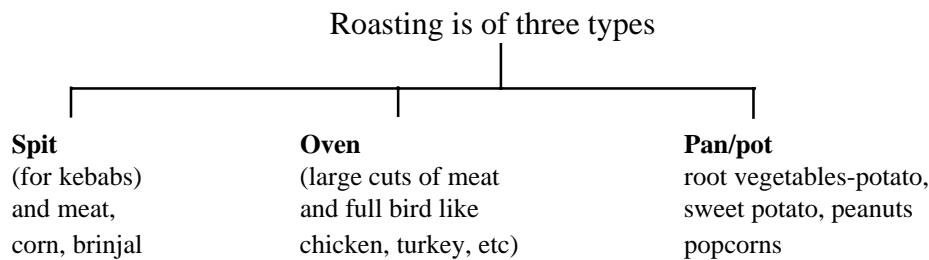
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B. Dry Heat Methods

Chappatis, breads, biscuits, etc., are an integral part of our daily diet. These food items and many more are cooked by hot air. Some of the techniques of cooking with hot air/dry heat are as follows.

1. Roasting

Food is brought in contact with direct heat of the flame or any other source of radiant heat. Food is periodically coated with fat and turned around for uniform cooking. Roasting imparts a characteristic brown colour and flavour to food. Chappatis, various vegetables and mutton or chicken kebabs are prepared by roasting.



2. Grilling or Broiling

The food is placed on a metal grid directly above the source of heat or a tray placed under the source of heat. Electric grills and hot plates are available. You can prepare pizzas, cheese toasts, chips, grilled tomato, capsicum, sandwich, etc.



Fig. 8.8: Grilling

3. Baking

This method combines the action of dry heat with that of steam which is generated while the food is cooked. It involves use of oven or tandoor. Baked foods are crisp, brown on top, soft and porous inside.

Cakes, breads, biscuits, puddings some vegetables and meat dishes are cooked using this method.

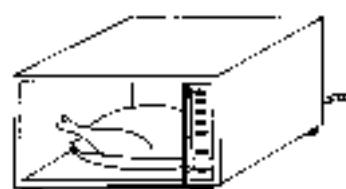
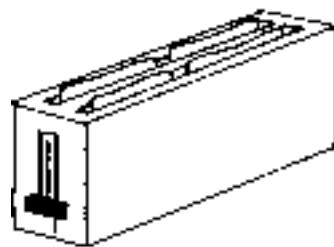


Fig. 8.9: Baking

4. Toasting

Bread slices are kept in a grill between two heating elements and browned on both the sides. Automatic toasters are also available which prevent burning or blackening of the bread. The toaster shuts off when toast is done.



Notes

**INTEXT QUESTIONS 8.2**

8.2 1. Name the method of cooking the following:

- i) Seekh Kabab
- ii) Biscuits and cakes
- iii) Brown toast
- iv) Popcorns

2. State whether following statements are true and false.

- | | |
|--|-----|
| (i) Grilling is a method of cooking by dry heat. | T/F |
| (ii) Steaming food is possible only by direct method. | T/F |
| (iii) While baking, food is cooked with the help of hot air. | T/F |
| (iv) For boiling food, water must boil all the time. | T/F |
| (v) Simmering is done at low temperature. | T/F |
| (vi) Toasting means browning the food from all sides. | T/F |
| (vii) When food is cooked on direct flame it is called roasting. | T/F |

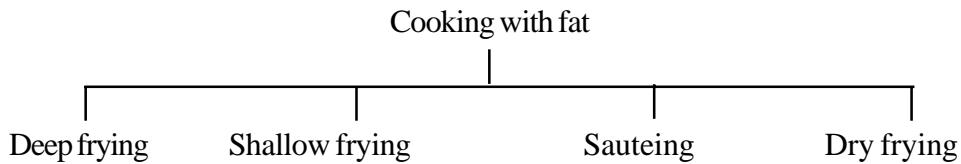
C. Cooking with fat

We all like to eat samosas, pakoras and paranthas. What method of cooking is employed in cooking them? Yes, frying. What do you mean by frying? When food is cooked in sufficient quantity of fat, it is called frying.

Cooking the food by partially or fully immersing in hot fat till brown is called frying.



This method can broadly be classified into four categories :



- 1. Deep frying** - Food is immersed in hot fat in 'Kadhai' or a deep fryer (with wire net) till it is golden brown. Special "Ladles or Poune" are used to drain out excess fat once the food is cooked. Tasty samosas, fish, chips, cutlets, puris are all 'deep fried'.

Deep frying is useful for bulk cooking, saves time, effort and fuel. It also conserves more nutrients as compared to other frying techniques.

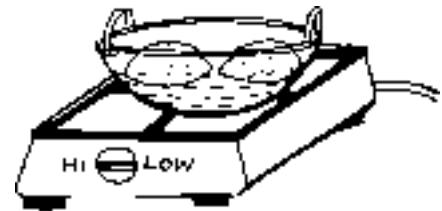


Fig. 8.11: Deep Frying

Points to remember

- Do not fill the 'kadhai' more than two-third of its volume
 - Reduce the flame immediately if oil starts smoking
 - Turn the food gently to prevent splashing of hot oil
 - Drain all the excess oil from the food after frying
 - Don't over-fry the food
 - Repeated use of same oil is not good for health.
- 2. Shallow Frying** - In this method, food is cooked in a flat vessel like frying-pan or 'Tava'. The food is partially immersed or has only surface contact with oil or fat.

Dosa, paranthas, cheela, omelette and tikki, etc., are all shallow fried.

- 3. Sauteing** - It involves use of just minimum fat to cover the base of the pan. The food is tossed occasionally to cook evenly. Very little amount of heat is applied to the pan and food gets cooked in its own steam.
- Vegetables, mushrooms and noodles are sauted. It is a healthy cooking method which retains the nutrients and flavours of the food.

4. **Dry Frying** - It is used for food having sufficient fat of their own. On application of dry heat, oil melts out and cooks the food.

Bacon, sausages, paneer made from full cream (tikka) are cooked through this method.



Fig. 8.12: Dry Frying

- D. Microwave cooking** - It is a fairly recent method of cooking. It involves use of high frequency electromagnetic rays (microwaves) which penetrate into the food. These produce the frictional heat by setting up vibration within the food.

Cooking is done in special ovens called Microwave oven.

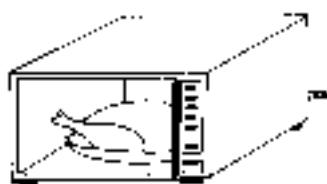


Fig. 8.13: Microwave Cooking

It is a quick method of cooking and reheating the food. Food does not turn brown and also retains its original colour. It is used in fast food shops for quick service.

E. Solar Cooking

Solar energy is the primary source of most energy available on earth. Use of this method has come up as an alternative fuel source for cooking.

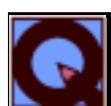
Solar cooking is based on the principle that black surface and background absorb solar rays and get heated. Food kept in the black boxes are cooked with this heat.



Fig. 8.14: Solar Cooking

It is used for making dals, boiled rice and vegetables, breads and biscuits.

The maximum temperature it attains is around 100°F and hence cannot be used to make chapattis and for roasting.



INTEXT QUESTIONS 8.3

1. Fill in the blanks in the following statements.
 - i) When food is cooked between two heated elements the procedure is called _____.

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- ii) When food is cooked in a hot chamber it is called _____.
- iii) When food is cooked by dipping it in hot water it is called _____.
- iv) When food is cooked by dipping in hot oil it is called _____.
- v) When food is cooked by touching the hot greased pan the process is called _____.
- vi) When food is cooked with hot vapour it is called _____.
- vii) When food is cooked on hot flame it is called _____.
- viii) When food is cooked by placing it in hot sand/ash it is called _____.
- ix) When food is cooked by placing it in the hot sun it is called _____.
- x) When food is cooked in sealed container the process is called _____.

2. Differentiate between deep frying/shallow frying.

3. Which method of cooking does a vendor use to prepare a plate of tasty noodles?

4. List the precautions we need to take while frying food.

5. Tick the correct answer:

- (i) Microwave cooking uses high frequency
- a) Electromagnetic rays
 - b) Electric rays
 - c) Infrared rays
 - d) Ultraviolet rays
- (ii) In solar cooking, food is kept in a box which is
- a) Red
 - b) Black
 - c) White
 - d) Yellow

8.4 LOSS OF NUTRIENTS

All of you are now familiar with various methods of cooking. All these are aimed at making the food not only tasty, palatable but also nutritious. But unfortunately during all the stages of pre-preparation and preparation of food, there are losses of nutrients to some extent. Some of these losses can be prevented and with the help of certain practices the nutrition in food can be enhanced during pre-preparation and cooking. Let us see what these practices are.



Notes

- **For vegetables :**

- Wash ***before*** peeling and cutting. Water soluble vitamins and minerals will not be lost.
- Do not peel and cut the vegetables long before cooking
- Cut vegetables into large pieces, to save nutrients.
- Cook the vegetables in minimum amount of water or utilize the excess water in soups, dals and curries.
- Cook the vegetables till tender, do not overcook.
- Green leafy vegetables can be cooked without water as they already contain lot of water.
- Use some vegetables in raw form as salad daily.
- Vitamin C can be best conserved by cooking covered for a very short period.

- **For fruits:**

- Cut just before eating
- Consume in the natural form
- Wash and consume apples, chikkoo and do not remove the skin

- **Cereals and pulses:**

- Do not sieve atta as all the bran (chokar) will be lost. Bran or chokar is rich in B complex vitamins.
- Avoid repeated, prolonged washing of rice and dal avoid. It prevents loss of vitamin B complex.
- Wash and soak dals and rice. Use the soaking water for cooking to save water soluble vitamins and minerals.
- Avoid use of cooking soda to preserve nutrients.
- Cook for the shortest possible time in minimum amount of water.

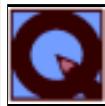
Steaming under pressure (pressure cooking) cooks fast and conserves nutrients.



Notes

- **Milk:**

Repeated boilings and exposure to sunlight destroys the essential nutrients present in milk.


INTEXT QUESTIONS 8.4

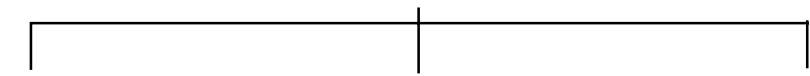
Q1. Tick (✓) the correct answer:

- (i) Green leafy vegetables lose (Vitamin C/Iron) while cooking
- (ii) (Peel/wash) the potatoes before boiling
- (iii) Cooking in (open pan/closed pan) saves nutrients.
- (iv) (Use/throw) the water used for soaking the rice.
- (v) Cut the vegetables into (big/very small) pieces to save nutrients.

8.5 EFFECT OF HEAT ON COOKING

On being subjected to heat foods undergo certain changes, which may be external changes or internal or both. Let us see what changes externally and how you can recognise these changes.

External Changes



Colour

Flavour/Odour

Texture

- **Change in colour:** This change is visual and you can see it. Generally you will notice that vegetables become darker in colour when heat is applied. But when they are overcooked the colour changes for example, green vegetables changes to a darker brown colour, carrots cooked in milk, imparts pink colour to milk, similarly you will see red meat turns brownish red.
- **Change in flavour:** You can smell this change. Sometimes it is all over the house. Pungent smell of fish and other non-vegetarian foods decrease on cooking. Zeera, clove, hing, etc., acquire a special smell on roasting.
- **Change in texture:** This change is best known when eaten but you can also feel it on touching the food or even visually. Cereals and pulses, root vegetables become soft on boiling. Similarly meats become soft and tender and egg coagulates on cooking to give a soft solid.

Internal Changes

Food undergoes some internal changes as well and these changes are in terms of the nutrients.

1. **Carbohydrates** - They absorb water and swell up in the presence of moist heat. Over cooking results in the bursting of carbohydrate molecules and makes the food pasty and sticky.
2. **Proteins** - These coagulate on heating and become tender. Prolonged cooking results in their shriveling and hardening.
3. **Fats** - At optimum cooking temperature, fats do not change. However, on extensive heating, start to disintegrate into fatty acids and glycerol.
4. **Minerals** - Normally they do not change. However, if excessive water is used for cooking and then discarded, a lot of minerals leach into the cooking water.
5. **Vitamins** - Need special mention specially water soluble ones, B-complex and vitamins C.
 - **Vitamin C** - In presence of light and on heating, it is easily oxidized and lost. It is better that fruits and vegetables, which contain vitamin C, are consumed in raw form.
 - **Vitamin B complex** - These are lost even during washing of foods. It is also lost due to leaching. Discarding the cooking water and addition of soda bicarbonate also leads to further losses.

Activity 8.2



Observe and list two changes when you cook dal, palak, rice.

8.6 ENHANCEMENT OF NUTRITIVE VALUE

Loss of nutrients during pre-preparation, preparation and cooking can be minimized. In fact, judicious use of certain methods can enhance the nutritive value of foods.

At the home level - It can be achieved through age old, time-tested methods of:

- Germination/Sprouting
- Fermentation
- Supplementation/Combination

At the manufacturing level

- | | |
|---|---|
| <ul style="list-style-type: none"> ● Fortification ● Enrichment | <ul style="list-style-type: none"> - Vegetable oils with Vitamin A and D; salt with iodine. - Processed food products |
|---|---|



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Preparation of Food

Let us discuss how we can enhance the nutrient content of our daily dishes

Methods

1. Germination

Foods Involved

Pulses - Moong, chana, moth beans, peas, whole grains, wheat grains.

Effect

- Increase in vitamin C and B-complex.
- Bound iron becomes available to the body.
- Easy to digest and
- Easy to cook.

2. Fermentation

It is a process by which some micro-organisms are added to the food to make them light and fluffy.

Dough - atta/maida, curd, cereal - pulse combination (dal+rice), beverages.

- Increase in B-complex vitamins and vitamin C.
- Improves digestibility as carbohydrates, proteins are broken down into simple forms.
- Imparts special taste
- Increases the availability of iron, calcium.

3. Supplementation

Process of combining foods from different food groups, thereby improving the nutritive value.

Cereals and pulses,

cereals and milk.
pulses and milk
eg.

kheera, halwa, khichdi, idli, dosa, etc. are few examples of combination.

Total nutritive value of dish is increased through the combination of ingredients

Note :

1. Fermentation and germination increase the nutritive value of food at no additional cost.
2. Combination/supplementation is the cost effective way to a well-balanced and healthy diet.



Activity 8.3

Germinate each of the following and measure their volumes after germination. Observe:

Volume before germination	Volume after germination
(1 teaspoon of channa)	
1 teaspoon of whole moongdal	
1 teaspoon of wheat grains	
1 teaspoon of moth	



INTEXT QUESTIONS 8.5

1. Match the statements of Column A with those in Column B.

A

- i) Cereal with milk
- ii) Cereal with dal

B

- a. spinach khichri
- b. fruit custard

**Notes**

- iii) Dal and vegetable
- c. rice-kheer
- iv) Cereal with vegetable
- d. dosa
- v) Dal, cereal, vegetable.
- e. paushtic namkeen dalia
- vi) Milk with fruit
- f. vegetable cheela

2. Name the method of food enrichment used for–

- i) A soft spongy dhokla _____
- ii) Iodised salt _____
- iii) Green sprout chat _____
- iv) Vegetable khichdi _____

3. Name two changes brought by cooking in each of the following foods

- i) Rice _____ ii) Fish _____
- iii) Chappati (Wheat) _____ iv) Apple _____

- v) Split moong dal on boiling _____
- _____
- _____
- _____

8.7 EFFECTIVE USE OF LEFT OVER FOOD

Cooked food is sometimes leftover after the meals. A lot of effort and money goes into food production. Hence, these foods should be reused effectively.

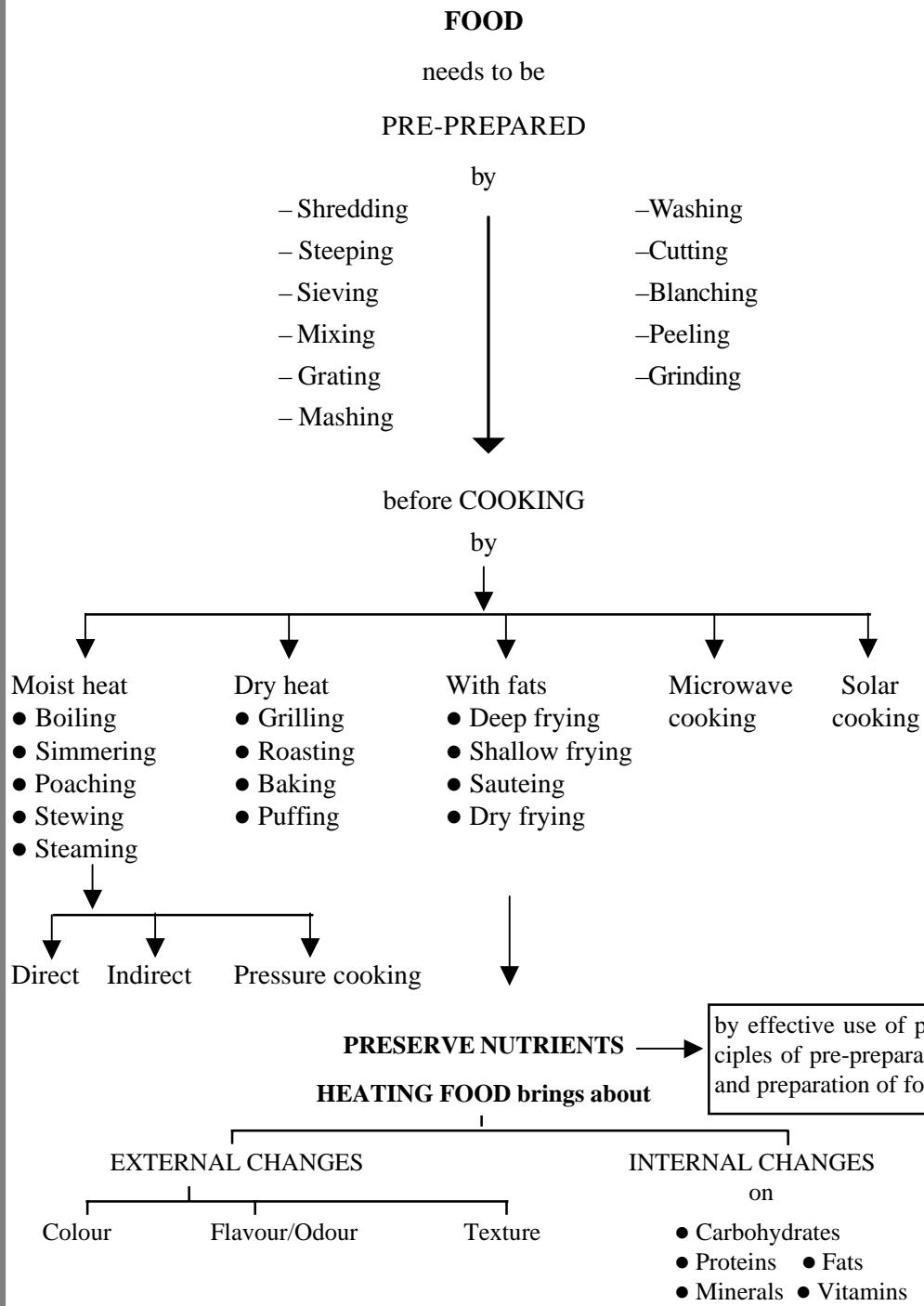
Some dishes which we all are familiar with and can be made by using the left over food are paranthas stuffed with dal, vegetable cutlets, pao-bhaji, boiled rice kheer and many more.

Here are some other examples for you:

- Vegetables pulao can be mixed with potatoes and made into cutlets, koftas.
- Sour curd can be used for making 'kadhi'. It can be mixed with maida to make bhatura, curd rice, or lassi.
- Leftover tomato-onion salad can be used for making dry mixed vegetable, stuffed omlettes, soups and curries.
- Bread slices can be mixed with potatoes to make tikkis, cutlets etc.
- Left over green leafy vegetables can be kneaded in dough to make parathas or puris.



WHAT YOU HAVE LEARNT



NUTRITIVE VALUE OF FOODS CAN BE ENHANCED

At home level

- Germination
- Fermentation
- Combination/Supplementation

At commercial level

- Fortification
- Enrichment



TERMINAL EXERCISE

1. Explain, giving examples, different methods of enhancing the nutritive value of food, both at home and at manufacturing level.
2. Giving suitable examples, write short notes on the following methods of cooking.
 - i) Boiling
 - ii) Stewing
 - iii) Simmering
 - iv) Steaming
3. List all the pre-preparation activities required for cooking the following food items.
 - i) Palak Pakora
 - ii) Mooli Paratha
 - iii) Peas - Pulao.
4. List the ingredients of Samosa, explain different types of changes that occurs in each ingredient during the process of cooking.
5. What precautions will you take while making mixed vegetable pulao to avoid loss of nutrients.
6. Give at least five dishes, that can be made from left over food, other than the ones listed in the lesson.

Notes



ANSWERS TO INTEXT QUESTIONS

- 8.1**
- | | |
|----------------------------|--|
| 1. Stewing and simmering: | Both cooked on slow fire/little water. Stew is covered and simmering is without lid. |
| 2. Peeling – | Blanching – |
| Removing skin with a knife | Removing skin by dipping in hot water and then in cold |
| 3. Shredding and grating – | Breaking food in very small pieces.
Shredding is with knife, grating with grater. |
| 4. Grinding and mashing – | Breaking food to produce a paste
Grinding is with a grinder, can also be for producing powder |
| Mashing – | Make food soft and then press to produce paste. |
2. taste, safety, softening, variety, attractive and flavour

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Preparation of Food

- 8.2** 1. i) Spit Roasting ii) Baking iii) Toasting
iv) Pan/pot roasting
2. All statements are True
- 8.3** 1. i) toasting ii) baking iii) boiling
iv) deep frying v) shallow frying vi) steaming
vii) grilling viii) roasting ix) solar cooking
x) pressure cooking
- 2 Refer text
3. Refer text
4. Refer text
5. i) a ii) b
- 8.4** i) Vitamin C ii) Wash iii) Closed pan
iv) Use v) Big
- 8.5** 1. i) c ii) d iii) f
iv) e v) a vi) b
2. i) Fermentation ii) Fortification iii) Germination
iv) Combination/Supplementation.
3. i) soft and white/swells up. ii) soft, less smelly.
iii) colour - darker, texture - crisper, taste - sweeter.
iv) soft and darker v) soft and thick

AUDIO

Bhojan Pakane Ki Vidhiyan

VIDEO

Conservation of Nutrients.

For more information log on to
[http://www.hindustanlink.com/recepies/index\(r\).htm](http://www.hindustanlink.com/recepies/index(r).htm)
<http://sio.midco.net/poornima>