CHAPTER : 16

PREPARATION OF FOOD AND INCREASING FOOD NUTRITION

Cooking of food has been going on since ancient times. Even in the modern age the process of cooking food has been undergoing changes and is being modified. There are various methods of cooking food but in the present times while cooking food care is taken that food remains tasty, full of nutrition and even attractive.

Advantages of activities—

1. Food items which are solid and firm become soft and digestible on cooking. They can be easily chewed and eaten so that digestive juices can easily perform action and digestion of food becomes easier.
2. Taste and aroma of food increases on cooking. Natural aroma of some food gets lost on cooking. Such as fish loses its unattractive smell on cooking and becomes palatable. On the contrary aroma of good rice gets doubled on cooking.
3. Cooking changes food items into many forms. Like chapattis, bread, biscuit from wheat flour.
4. While cooking, temperature destroys harmful bacteria present in the food and makes food safe. Food free from bacteria has no chances of causing illness.

Methods of cooking food–

Food can be cooked in many ways– bread and biscuit is baked, some foods are fried in hot oil. In these methods of cooking varying temperature is required one way or the other. On the basis of cooking medium, cooking methods can be classified into following types–

1. By moisture- boiling, simmering, stewing, cooking by pressure and steam
2. By hot air- baking, roasting
3. By greasing- frying, deep frying, sautéing

By moisture—

1. **Boiling –** this is the most popular and simple method. The amount of water taken in this method should be such that the food gets completely immersed in it. Thereafter, water is set for boiling at 100^0C. At this temperature, bubbles on water surface are formed and burst continuously. Pulses, rice, potato and other vegetables are cooked by this method.
2. **Simmering–** this method is the same as boiling. Difference is of temperature only. The temperature of water is maintained at around 85^0C. The bubbles formed in the water burst before they reach the water surface. Because of low temperature this method takes more time. Curry, *kheer* etc are prepared using this method.
3. **Stewing–** in this method, food item is cooked with very little water at a low flame in a covered pot. This method takes a lot more

time but food cooked is soft, digestible and tasty. For example, meat, vegetable stew is prepared using this method.

Steaming— water gets transformed into steam on boiling and food is cooked using this steam. Food is cooked by two ways using this steam.

(a) Direct method– in this method, water is boiled in a pot. When water starts boiling then raw food is placed in a sieved pot and is placed on a raised platform kept in the pot. Cooking takes place in a covered pot. Idli, *Dhokla* are prepared by this method. In this method heat is generated within the product itself.

(b) Indirect method– In this method, food does not come in direct contact with the flame. The indirect (or conventional) methods are those in which heat is generated externally to the product and is then transferred to it through its external surface by conduction, by convection or by radiation. Pudding is prepared using this method.

4. **Pressure cooking–** in this method food is cooked at pressure above the atmospheric pressure. The water boils above 100^0 and as the pot is covered steam cannot escape and thus, food is prepared quickly. By this method, potatoes are boiled in 10-12 minutes, rice in 6-8 minutes and white chickpeas in about 30 minutes.

2. By hot air—

1. **Direct roasting–** in this method food is cooked directly in contact with fire. While roasting food is continuously swirled and mixed so that heating is homogeneous. Example- roasting potato, sweet potato, corn, meat, etc.
2. **Indirect roasting–** in this method food does not come in direct contact with fire. Preparing bread on a pan, roasting of groundnuts, brown chickpeas in hot sand are some examples of this method.
3. **Baking–** for cooking food in this method, oven or clay oven is used. These ovens are provided with lids so that the hot air remains inside and cooks food. Cake, biscuits, bread, etc. can be prepared by this method.

3. By greasing—

Cooking by greasing is one of the famous methods of cooking because when food comes in contact with some kind of grease, its taste enhances and cooks readily. Depending on the amount of oil or ghee used for cooking, there are following methods of cooking:

1. **Shallow oil frying–** in this method, food is fried in shallow pots such as pans, frying pan, etc, in minimum oil and at low flame. Oil and ghee is used so that food does not stick on pot's surface. Cutlets, dosa, *paranthas* are cooked by this method.
2. **Deep oil frying–** this method is also known as French method. Oil or ghee is used in sufficient quantities so that the food completely dips in it. Dumplings, rissole, etc are prepared by this method.
3. **Sautéing–** in this method, food is cooked in very low amount of ghee or oil at low flame. Food is continuously tossed so that the entire ghee or oil used gets absorbed. A little more ghee can be used if food remains hard. Many vegetables are cooked by this method.

Increasing food nutrition

Nutrition of food depends on the nutritive elements in it. Wheat is a good source of carbohydrates pulses for protein, fruits or vegetables for vitamins and minerals. But the amount, quality and availabe nutritive elements get affected once the food gets cooked. Therefore, careshould betaken that these nutritive elements are not destroyed while cooking. Following points must be kept in mind—

1. Fresh fruits and vegetables should be used.

Food items which can be eaten raw should not be cooked so that maximum vitamin-minerals are retained. Example tomatoes, carrots, radish, cucumber, onions, etc.

2. Remove peels of vegetables as thin as possible otherwise vitamins and minerals present in peels will be lost.
3. Cut big pieces of vegetables so that the exposed area of vegetables is considerably large and nutritive elements are destroyed less.
4. Cook the vegetables in a covered pot in minimum quantity of water so that nutritive elements remain preserved againt steam. If water in the vegetables is in excess, use that same water for pulses, or make a soup of it.
5. Do not rub rice and pulses while washing them in water. Water-soluble vitamins may get destroyed.
6. Do not throw away starch of rice, it contains many nutritive elements.
7. Use whole grain wheat and pulses with peels in food. These contain vitamin B group, mineral salts and fibers in large quantity.
8. Do not stir food continuously while cooking it. By stirring, large part of food comes in contact with air which damages vitamin C by oxidation.
9. Cook protein-rich foods- eggs, meat, fish at low flame. At high flame, protein present in them becomes stiff and cannot be digested easily.
10. Cooking in pressure cooker preserves nutritive elements and saves time and fuel.
11. Nutritive elements in food can be increased in many ways- mixing of food items, germination, fermentation and fortification- increases the nutritve value of food.

1. Combination of food items–

All the food items do not contain nutritive elements in the same quantity. Some contain more while some have fewer elements. If we consume same or particular food item for a long time, our body may become deficient of other of element that we were not consuming for a long time & we may also see its effects. For example, consuming rice for a long time shows symptoms of beriberi. Therefore, we should mix foods to avoid any instances of disease. If we mix a food item having excess of one nutritive element like carbohydrates in wheat with a food item having less of that particular nutritive element, it increases quality and quantity of nutrition in our food. If we consume only wheat or only pulses then we will only have incomplete protein in our diet but if we consume them together we will have complete protein in our diet. In the same manner we can increase nutrition in our diet by eating wheat with milk or milk products with vegetables.

2. Germination–

Germination of whole wheat and pulses increases their nutrition multiple times. For this keep wheat grains and pulses soaked in water overnight and then keep the soaked grains tied in a wet cloth. In summers, these grains germinate in a day and in winters they take three days. In this germination process, some vitamin C and B are synthesized in seeds. In addition some anti-nutritional factors are destroyed and protein and iron availability increases.

3. Fermentation–

The required molecular organisms for fermentation are present only in sugar-rich food items. In this process, these microorganisms breakdown carbohydrates into alcohol and carbon dioxide in the presence of heat and moisture. Because of this a spongy texture is developed in the food item.

$$C_6H_{12}O_6 \longrightarrow \text{anaerobic} \longrightarrow C_2H_5OH + CO_2$$

Starch ethyl alcohol carbon dioxide

Vitamin B group is synthesized in good amount during fermentation. The anti-nutritional factor gets destroyed and the protein- iron gets increased. The food becomes light and digestible. Idli, dosa, *dhokla*, bread, etc are prepared by this method.

4. Fortification–

Fortification is the practice of deliberately increasing the content of an essential micronutrient, i.e. vitamins and minerals (including trace elements) in a food irrespective of whether the nutrients were originally in the food before processing or not, so as to improve the nutritional quality of the food supply and to provide a public health benefit with minimal risk to health. For example, deficiency of iodine in water and soil of Rajasthan led to the consumption of iodine-rich salt in the state so that the deficiency of iodine can be made good. In the same way, addition of vitamin A and D in vegetable ghee can prevent many diseases. Nutrition level of food cannot be increased by fortification at home.

5. Parboiling–

Sometimes raw rice or paddy is dehusked by using steam. This steam also partially boils the rice while dehusking. During this cooking, protein and vitamin B group gets attached with starch of rice. Thus, availability of protein and vitamin B increases in rice and rice becomes more nutritious.

In this way we can increase nutrition and quality of various foods by various methods.

IMPORTANT POINTS:

1. Food becomes soft and easily digestible on cooking.
2. The taste and aroma of food increases on cooking and also food takes different forms on cooking.
3. The nutrition of food depends on the nutritive elements present in food.
4. Care should be taken while cooking food so that nutritive elements are not destroyed.
5. Pulses and vegetables should be cooked only in covered pot and according to requirements. Cooking in pressure cooker requires less time and efforts and also maintains nutrition of food.
6. Nutrition in food can be increased by mixing foods, germination, fermentation, parboiling, fortification, etc.

EXERCISE:

1. Choose the correct option—

(i) Which of the following is not a method of cooking by moisture?

(a) Boiling (b) Simmering
(c) Frying (d) Cooking by steam

(ii) The temperature of water during simmering is

(a) 50^0C (b) 30^0C
(c) 100^0C (d) 85^0C

(iii) Germination increases ———— in food

(a) Protein (b) vitamin C
(c) Calcium (d) Iron

(iv) Which gas is released during fermentation?

(a) Carbon dioxide (b) Oxygen
(c) Nitrogen (d) Methane

2. Why do we cook food?
3. What do you mean by fortification and parboiling?
4. What is sautéing?
5. Write in detail the different methods to increase food nutrition.
6. Explain different methods of cooking with examples.

ANSWERS:

(i) c, (ii) d, (iii) b, (iv) a