FREQUENTLY ASKED QUESTIONS

1. **Give the Botanical classification of vegetables?**

Ans. Botanical classification is based on taxonomical relationship among different vegetables. Plant kingdom is divided into four viz. *Thallophyta, Bryophyta, Pteriodophyta and Spermatophyta*. All vegetables belong to division Angiospermae of Spermatophyta. It is further divided into two classes viz., monocotyledoneae and dicotyledoneae.

2. **Classify vegetables based on plant part used?**

Ans. Based on the plant part used vegetables are classified into following groups:

1. Tubers: A tuber is a large underground stem that stores nutrients e.g., Potatoes.

2. Root Vegetables:

Roots store a plant's food supplies and send nutrients and moisture to the rest of the plant. Carrots, beets, turnips and parsnips are examples.

3. Bulb Vegetables:

A bulb is made up of layers of fleshy leaves surrounding a portion of stem.

They have intense flavour. Onion and garlic are examples.

4. Stem or Stalk:

Minerals and vitamins are transported through the stem or stalk to other parts of the plant. Celery and asparagus are common stalk vegetables.

5. Leaves:

Leaf vegetables are a good source of vitamins and minerals. The darkest

green leaves have the most vitamin A. Spinach, lettuce, and brussels sprouts are examples.

6. Flowers:

They include the flower of the plant and the stems. Broccoli and cauliflower are examples. They are high in vitamins and mineral.

7. Fruits: The fruit is the part of the plant that holds the seeds. Tomatoes, eggplant, pumpkins , squash are examples.

8. Seed Vegetables: Seeds are high in carbohydrates and protein as well as vitamins and minerals. Corn, peas, and beans are examples.

3. Define blanching and what is its purpose?

Ans. Blanching is heating vegetables in hot water at 88° C (190° F) for two to five minutes or with steam in a conveyor at 100° C (212° F) for one-half to one minute. Blanching inactivates natural enzymes that would cause discoloration off-flavours and off-aromas. It also serves to reduce the number of microorganisms and to render vegetables for easy packing into containers.

4. **What is the principle of dehydration in preservation of vegetables?**

Ans. During dehydration preservation is achieved by reducing the available moisture, or water activity to a level which inhibits the growth and development of spoilage and pathogenic microorganisms, reducing the activity of enzymes and the rate at which undesirable chemical changes occur.

5. **What is the principle of preservation by freezing?**

Ans. During freezing the temperature of a food is reduced below its freezing point and a proportion of the water undergoes a change in state to form ice crystals. The immobilisation of water to ice and the resulting concentration of dissolved solutes in unfrozen water lower the water activity (*a*w) of the food. Preservation is achieved by a combination of low temperatures, reduced water activity and, in some foods, pre-treatment by blanching.

6. **What are the different steps for production of potato chips?**

Ans. For the production of potato chips fully grown and ripe potatoes are thoroughly washed before peeling them. They are then trimmed and put in brine water for 30-35 minutes to prevent browning. They are afterwards cut in the required sizes on slicing machine. These slices are blanched in boiling water and are placed on drying trays which are then put in the drying machine. After drying, they are fried in edible oil to make them crisp and brown and are packed in polythene bags. The chips could be

salty or spicy.

7. **Define canning?**

Ans. Canning is defined as the preservation of foods in the sealed containers and usually implies heat treatment as the principal factor in prevention of spoilage. During canning thermal processing is used to ensure microbial safety and shelf life extension of food products.

8. **Give the flow diagram of different steps used in canning of vegetables?**

Ans. The various steps used for canning of vegetables are-

Sorting

⇩

Grading

⇩

Washing

⇩

Peeling, coring and piting

⇩

Filling into cans

⇩

Syruping or brining

⇩

Lidding or clinching

⇩

Exhausting

⇩

Sealing or seaming

⇩

Processing or commercial sterilization

⇩

Cooling

⇩

Testing of defects

⇩

Labeling, packing and storing

9. **What is the role of pickling in preservation of vegetables?**

Ans. Microorganisms are always on vegetables. Pickling prevents the growth of the microorganisms that cause spoilage and illness. When the acidity of a canned food is high, harmful bacteria such as *Clostridium botulinum* cannot grow.

10. **What are the different types of pickles?**

Ans. There are two types of pickles:

1. Brined (fermented) pickles require several weeks of "curing" at room temperature. During this period, colors and flavors change. Acid is produced as lactic acid bacteria grow.
2. Quick (unfermented) pickles are made in 1 or 2 days by adding acid in the form of vinegar. It is critical to add enough vinegar to pickling vegetables to prevent bacterial growth.

11. **Define Sauerkraut?**

Ans. It is the clean, sound product of characteristic flavour, obtained by full fermentation, chiefly lactic of properly prepared and shredded cabbage in the presence of not less than 2%, or more than 3% of salt. It contains, upon completion of the fermentation not less than one and one half percent of acid expressed as lactic acid.

12. **Define Kimchi and what is its origin?**

Ans. It is a group of fermented vegetable foods of Korea with cabbage or radish as the main ingredient. Cucumbers can also be added. Cabbages are cut and brined in 5 to 7% salt solution for 12hr or in 15% brine for 3 to 7hr. Thereafter, brined cabbage is rinsed and mixed with 10% seasoning ingredients i.e. garlic, green onions, peppers, ginger, mustard, parseley, sesame grains and fermented shrimp. This mixture is allowed to ferment in jars which takes a few days at a temperature of more than 20^0C

or 1 month below 10^0C. Kimchi has a pH value of 4- 4.5 and lactic acid content of 0.4 to 0.8%.

13.**Name the microorganism responsible for fermentation of Kimchi?**

Ans. The main organisms responsible for fermentation of kimchi is *Leuconostoc mesenteroides* and acidifying microorganism is *Lactobacillus plantarum.*

14.**What is the role of irradiation in preservation of vegetables?**

Ans. Irradiation is used to reduce post harvest losses. It reduces populations of spoilage micro-organisms in the vegetables and can slow down the speed at which enzymes change the vegetables therefore slow spoilage and inhibits sprouting in onions, potatoes, garlic, etc. Irradiation at very low levels (0.05-0.15 KGy) inhibits sprouting in tubers while cold stored potatoes on removal to ambient temperatures sprout profusely and the trade, usually resorts to manual desprouting.

15.**How preserves are prepared and what is its role in preservation?**

Ans. Preserves are prepared by addition of sugar and salt, and concentrating them by evaporation to a point where microbial spoilage cannot occur. The principle of preserve making is based on the reduction of water activity and thus creating conditions for lowering down the enzyme activity and inhibition of growth of undesirable micro-organisms.

16.**Define vegetable juice?**

Ans. Vegetable juice is a juice drink made primarily of blended vegetables and also available in the form of powders. Vegetable juice is often mixed with fruits such as apples or grapes to improve flavor. It is often touted as a low-sugar alternative to fruit juice, although some commercial brands of vegetable juices use fruit juices as sweeteners, and may contain large amounts of sodium.