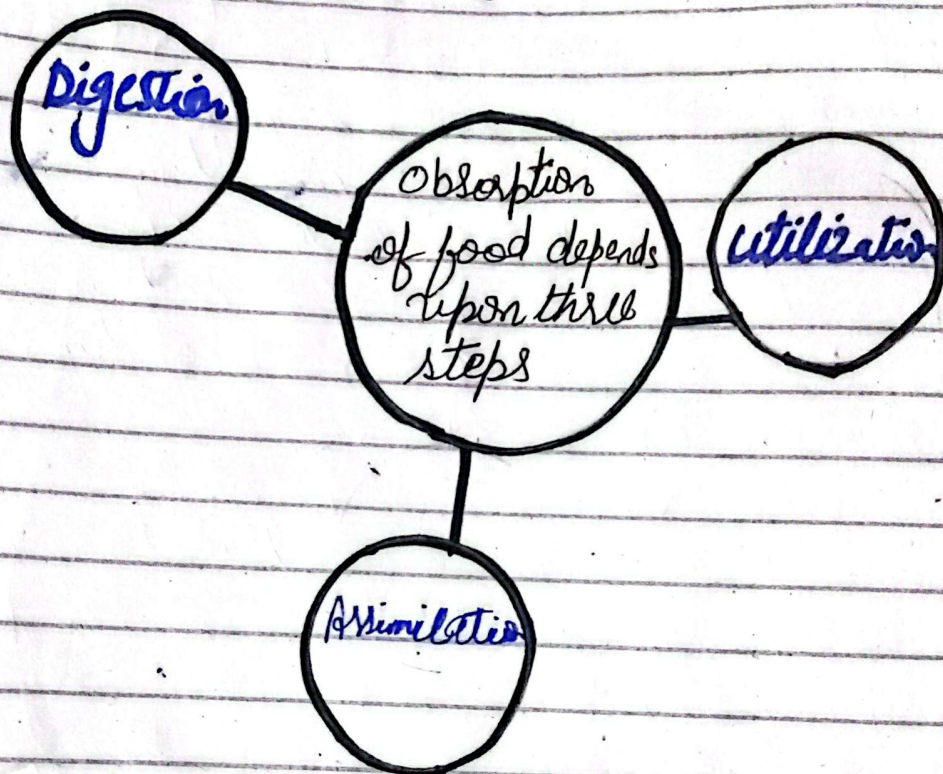


Q) write a note on bioavailability of food nutrients?

Bio-availability of food:

- ① Bioavailability of food nutrients is required as the amount of nutrients absorbed and utilized by body.
- ② It includes also availability of nutrients in food.

It is depends upon absorbed of food in body.



Factors affecting of Bio availability:

- ① Bioavailability of food nutrients

in body depends upon digestion of food, absorption and excretory activity of food.

For example: Vitamin C is absorbed and uptake by body by the availability of water Sodium-dependent co-transporter (SGLT)

Bioavailability in frozen preserved food:

The frozen food preserved ~~appears~~ nutrient of food as fresh food.

But it deteriorate food texture, quality, appearance.

Method to increase Bioavailability of food nutrients

A pepper called piperine increased bioavailability of nutrient up to 200%
① Carboxy-methyl cellulose present in food which increases shelf life and nutrients

Q) Write a note of Food Preservation and method of food preservation:

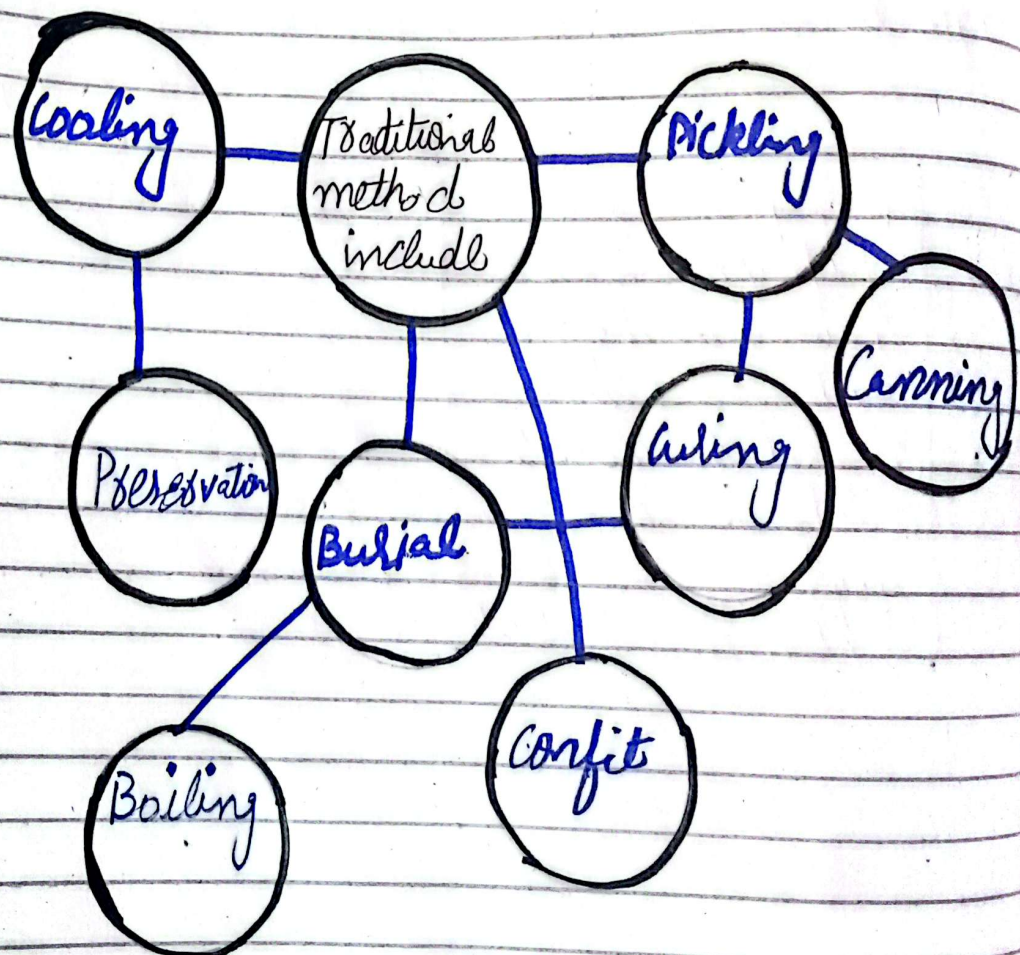
Food Preservation:

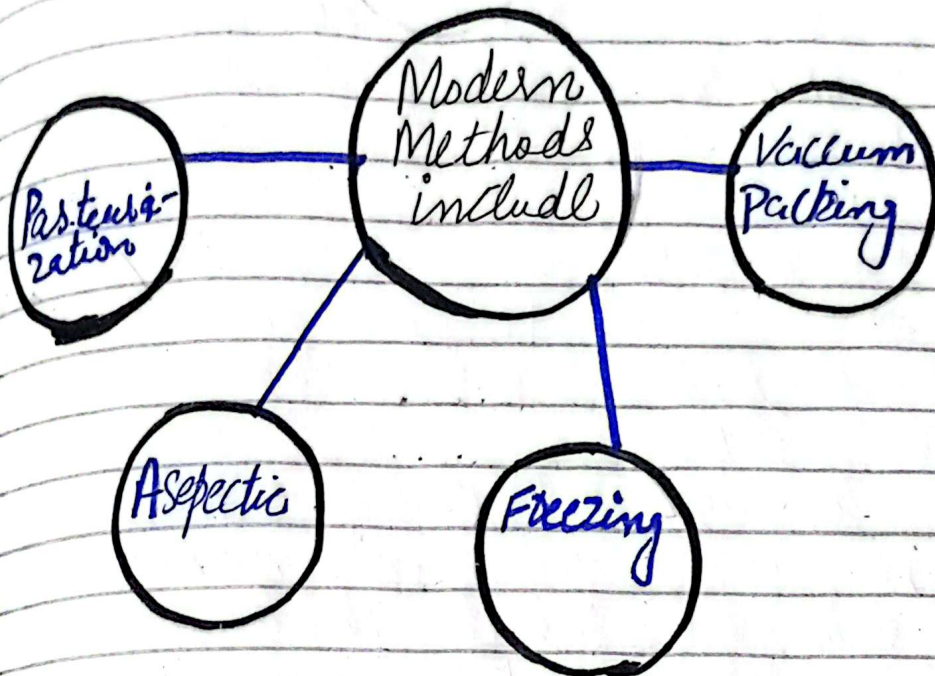
- It is refer as a preservation of food.
- It includes the method and technique for included for preservation of food.

2) Method of Food Preservation:

There are two method for food preservation.

- ① Traditional method of food preservation
- ② Modern method of food preservation





Traditional Methods Cooling / Freezing

It includes freezing of food to prevent them from deterioration, toxic substance and microbial growth.

2) Burial: It includes burial of food inside earth surface which contain lack of oxygen, and lack of sunlight which increases shelf life.

3) Boiling: For food preservation

Modern Methods Aseptic Method:

It includes the sterilization of meal preserved into sterilized cans and packs and in sterilize environment to increase shelf life and preserve them for microbial growth.

Vacuum Packing:

This technique is used to store

boiling is widely used. It kills bacteria, it is widely used to preserve water and milk for bacterial growth.

Confit: It includes drying of food and salting of food and soaking into sunlight for increasing shelf life; it was common before refrigerators.

Canning: Used of sterilized cans for preserving of food.

Curing: It includes drying and dehydration of food smoking and salting increase and improve this process

nuts. In these poor food store is vacuum environment is air tight packaging - which increase food shelf life.

Pasteurization

It is invented by Louis Pasteur in 1862.

It is widely used to preserve milk. First milk heated in 70°C at 20-25 minutes then cool about 10 minutes for preventing microbial growth.

Freezing:

Modern freezing methods includes

- 1) Modern freezing.
- 2) Cryogenic freezing.

Cryogenic Freezing:

It is a quick freezing of food with help of frozen liquid nitrogen - -196°C

Food Additives

- It is the substance which is intentionally added to the food. It is used to enhance production, texture, taste of food, it could include antioxidant, dye, colour, enzymes, emulsifiers etc.
- There is no nutritional value of food additives

There are two types of food additives

Direct Food Additives

Indirect food Additives

1- **Direct Food Additives:** They are intentionally added to the food for enhancing their texture, taste, colour. For example: Xanthan Gum is added in puffs, bakery, cakes which enhance its texture.

2- **In-direct Additives:** These are not directly added to food, however, they are added during packaging, handling procedure. For example: Plastic of packaging material added into food while handling and packaging.

Types of Food additives

Food additives ~~sto~~ can be used to enhance colour, nutrition and texture of food.

Colour dye is food additive without colour dye. Coke cannot be brown, margarine cannot be yellow.

- Some natural colour dyes include
- 1- Beta-carotene (yellow to tan)
 - 2- Grape skin juice (Red, green)
 - 3- Annatto - extract (yellow)
 - 4- Dehydrated beets (red to orange)

FOOD ADDITIVES IN EUROPEAN UNION

There are 2500 food additives in world. In European Union E is stand for food additives, like E-101 stand for Vitamin B1 (Riboflavin).

Q) What is Food Quality and Food Safety?

A) FOOD QUALITY: It includes the safety of food and attributes which may affect

on Product Value.

2) FOOD SAFETY:

It is refer as a hazardous of food which includes chronic and acute hazards, which may injurious to health.

Types of Quality Attributes

POSITIVE ATTRIBUTES

NEGATIVE ATTRIBUTES

2.1) POSITIVE ATTRIBUTES:

It includes origin, appearance, taste, texture of food, which increase product value.

2.2) NEGATIVE ATTRIBUTES:

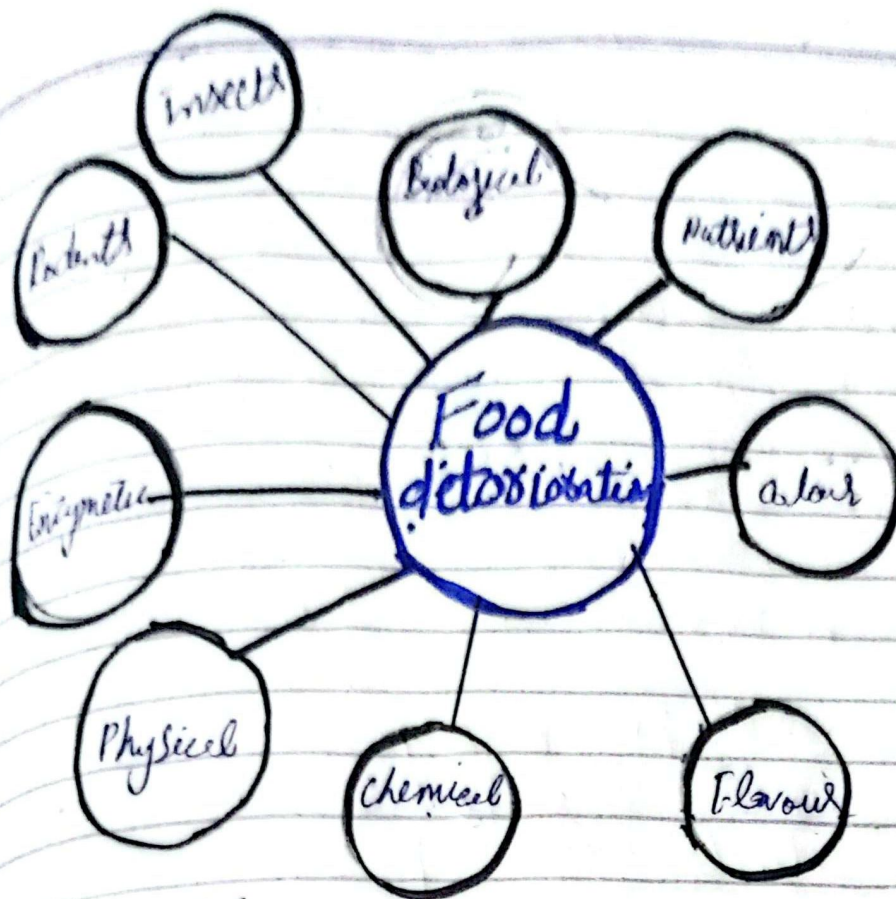
It includes spoilage, contamination and low quantity, quality and de-colouration. It decrease product value.

Q) What are Food Deterioration?

FOOD DETERIORATION:

Food deterioration is particularly associated with deterioration of food which may be influenced due to Enzymatic, ↓ nutrition, for colour, taste change of food

1) There are commonly 9 (nine) types of food deterioration.



ENZYMATIC CHANGE

Food is mainly deteriorate by enzymatic change

- ① Starch - Sugar conversion in plant tissue by enzymatic change / amylase.
- ② Oxidation of Phenolic tissue of plant.
- ③ Post-harvest methylation of plant tissue affecting quality and texture of food.

2. CHEMICAL CHANGE : This change

is due to chemical modification is food

- ① Unripe banana contain large amount of ~~starch~~ starch due to chemical change.

② Time time chemical change influenced by enzyme induced oxidation of unsaturated fatty acids being chemical change of ripening of fruits food and effect

3) FLAVOUR CHANGE:

Another deterioration is flavour change.

Ascorbic acid is highly sensitive for change. when ascorbic acid during packaging attach with packaging material its flavour change.

4) COLOUR CHANGE:

Mostly chlorophyll change due to deterioration. Phenophyllination is a process in which chlorophyll change.

5) Nutritional - Quality change:

Nutritional - quality change due to physical and chemical change.

lipid oxidation of food due to temperature or humidity effect its nutrition quality.

PHYSICAL CHANGE:

Modification in food due to physical effect like environmental factors works to bring physical change
e.g dryness of food

on the factor of physical stability food is divided into three types

- 1- Perishable changes.
- 2- Semi-perishable changes.
- 3- Non-perishable changes

- Canned or sealed food consider as perishable food
- Dry fruits considered as Semi-perishable food.
- Meat, Chicken, fish is considered as Perishable food without any processing

1. Biological changes:

Many biological factors involves to deteriorate food.

- Fungus cause white patches on bread due to its growth.
- Bacteria fastest growth within 20 minutes contaminate food and bring biological change

(1-) Insecticides and Pesticides change

many insects attack on some grains but in extreme

humidity and factors like 10°C below and above 35°C insects can't breed.

9- RODENTS: Feet and 'intestinal' track of mouse contain bacteria such as *Salmonella* which is associated with food-borne diseases.

Q) Write a note on Food Adulteration?

A) Food Adulteration is defined as adulterating food, adding impurities in food which is harmful for health.

- Mixing of dyer pebbles, argemone seeds in food for adulteration purposes.

There are illegal practices		
<u>Food Adulteration</u>		<u>Disorder</u>
1- Milk and Curd.	Starch powder, sugar	stomach disorder.
2) Ghee, cheese and butter	Starch, Vanispati	liver disorder, toxicity in body.
3) Lard	Pebbles, dust, stones, straw	stomach and intestinal disorder.

1) Pulses	dyes and artificial colours	stomach disorders.
2) Coffee	Chicory and turmeric powder	Diarrhoea.
3) Tea	Dyes, colours, artificial dyeing agent	liver disorder
4) Sugar	chalk, straw, coal stones	Gastric intestinal issue, and kidney stones.
5) Edible oil	Algemone seeds	toxicity in body.
6) Turmeric powder	chalk, stones etc straw, artificial colour dyes	cancer.
7) Pepper	Papaya seeds	harmful for health.

• Safe Guards for Preventing Food Adulteration:

- 1) Use of advanced biotechnological techniques as an indicator to prevent food adulteration
- 2) grains should be proper store