



PRINCIPLES OF VARIOUS PRESENTATION TECHNIQUES

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INTRODUCTION

- Preservation of meat is important because it is highly perishable due to neutral PH, moisture content and rich nutrients.
- Proper preservation methods need to be followed such that deteriorative microbial activity, enzymatic and chemical reaction along with physical changes can be prevented.
- Various preservation methods are employed such as:-
 1. Chilling /refrigeration
 2. Freezing
 3. Curing
 4. Smoking
 5. Thermal processing
 6. Canning
 7. Dehydration
 8. Irradiation



CHILLING

- It's widely used for short term storage.
- Storage of fresh meat is done at temp of 2-5 °C.
- Relative humidity is kept at 90% to stop the excessive shrinkage due to loss of moisture.
- Carcasses are first held in chill coolers(15 °C) and then passed to holding coolers(5 °C).
- Pork and poultry meat will have comparatively high microbial load so utmost care is important for their meat.



FREEZING

- Long term preservation of meat.
- It stops the microbial growth and retards action of enzymes.
- It has the advantage of retaining most of the nutritive value of meat during storage.
- Proper freezing retains most of the nutritional and sensory properties.
- Wrap the fresh meat in suitable packaging film before freezing or else it may undergo freezer burn due to progressive surface dehydration.
- The quantity of frozen meat is also influenced by freezing rate
 1. SLOW FREEZING
 2. FAST FREEZING

VARIOUS TYPES OF FREEZERS

1. Plate type freezers

2. Blast type freezers

STORAGE LIFE OF FROZEN MEAT

- Buffalo meat ,Beef ,mutton ,chevon is 6 months at -18°C and that of poultry meat is 4 months.

DISADVANTAGES OF FREEZING

During slow freezing formation of large ice crystals damage the cell and results in a protein denaturation.

Sometimes the texture of meat changed by this process



Freezing meat

CURING

- Curing refers to addition of NaCl & sodium nitrate/nitrite or sugar to meat for preservation , flavor ,& color.
- Temp of curing room is $3\pm 1^{\circ}\text{C}$ for 3-4days.

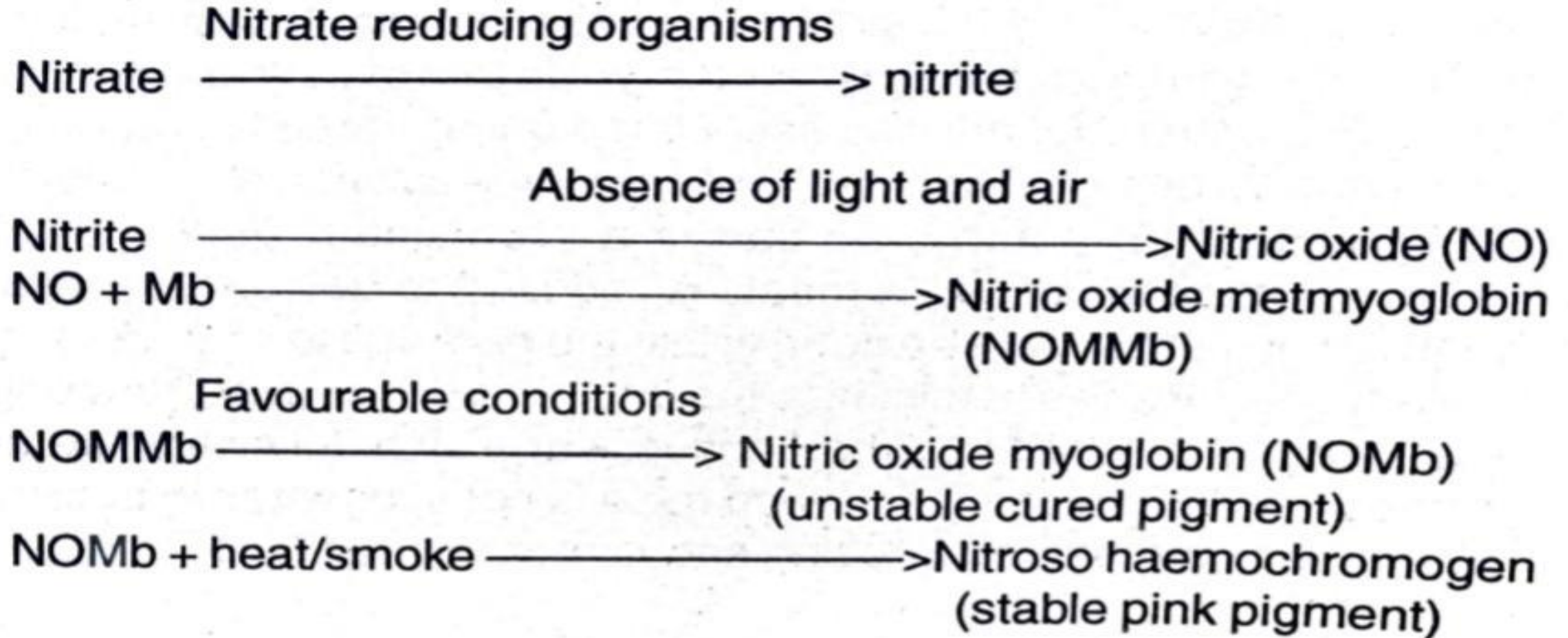
SODIUM CHLORIDE

- Acts by dehydration and alternation of osmotic pressure.
- Cl ions directly act on microorganisms.
- Slows down action of proteolytic enzymes in meat.

NITRATES & NITRITIES

- Inhibits growth of number of bacteria.
- Retard development of rancidity.
- Cured flavor is due to formation of benzonitrile and phenylacetone nitrile.
- These impart color as follows:-

CONT'D....



SUGAR

- Sucrose/dextrose is mainly used for this purpose.
- Serves as energy source for nitrate reducing bacteria.

Methods of curing

- 1, DRY CURE
- 2, PICKLE CURE
- 3, INJECTION CURE
- 4, DIRECT ADDITION METHOD



SMOKING

- Smoking of meat is due to surface dehydration, lowering of surface PH & antioxidant property of smoke constituents.
- Smoke contains large no.of wood degradation products which exert bacteriostatic effect.
- Aldehydes and phenols condense to form resins and contribute to color of smoked meat products.
- Smoke is produced in smoke house
where sawdust/hardwood /both are
Subjected to combustion at a temp of
about 300 °C



Advantages of smoking

- Kills bacteria and slows growth of other types of bacteria.
- Adds some flavor to foods.
- Prevents fats from developing a terrible taste.
- Changes color.
- Can last longer in shelf life.

Disadvantages of smoking

Eating too much smoked food can lead to
Some cancers.



THERMAL PROCESSING

- It's employed to kill the spoilage microorganisms.
- Two methods are followed in thermal processing
 1. Pasteurization (moderate heating at 58°C - 75°C)
 2. Sterilization (heating above 100°C)
- Exposure of meat to high temp imparts sulphhydryl flavor in cans and modifies texture.

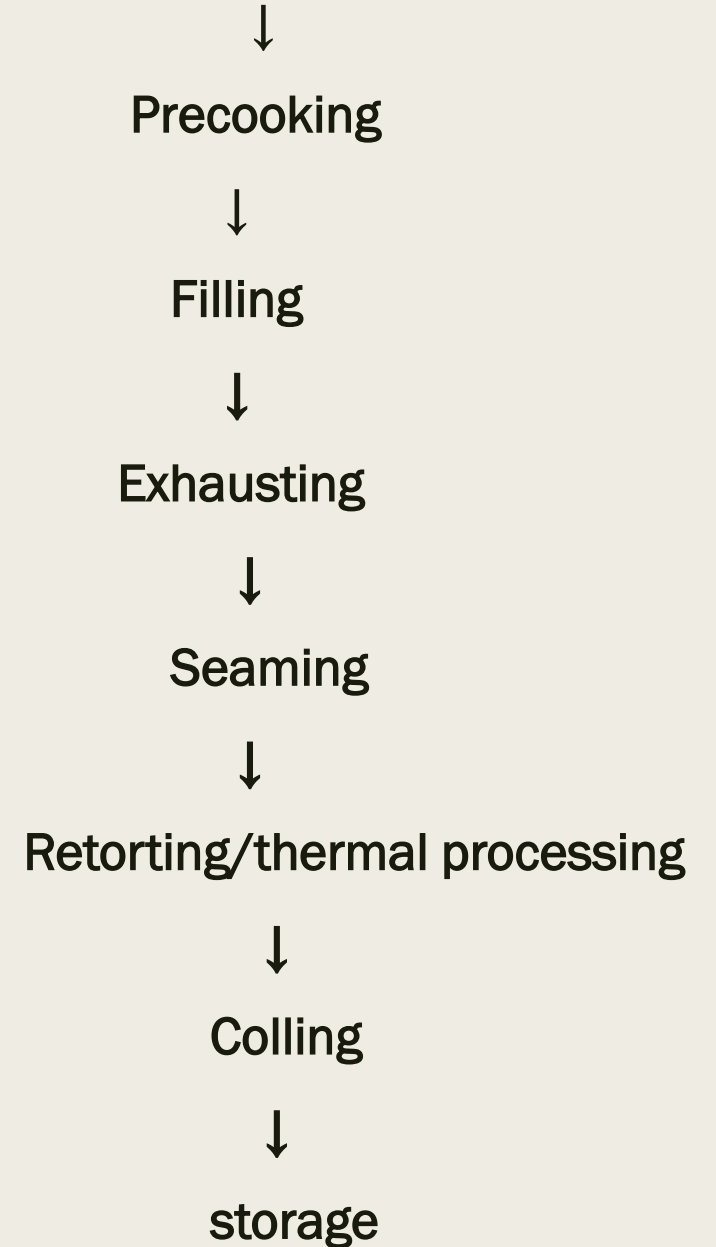


CANNING

- Canned meat products have a shelf life of at least 2 years at ambient temperature.
- Conventional canning is done in the following steps.



Preparation of meat and gravy



DEHYDRATION

- Removal of water from meat ,concentrates the water soluble nutrients and makes them unavailable to microorganisms.
- Dehydration lowers the water activity to prevent the growth of spoilage organisms.
- Mechanical drying is done by passing hot air under controlled humidity.

FREEZE DRYING

- Freeze drying involves removal of water from meat via sublimation from frozen state to vacuum state by keeping it under vacuum & giving a low heat treatment.
- 3 stages 1,Pre freezing
 - 2 Primary drying
 - 3, secondary drying

Advantages

They have a great storage stability.

Disadvantages

Dehydrated meat have less moisture but high calories, So it might be unhealthy.



IRRADIATION

- Radiation is the process of emission & propagation of energy in the material medium
- With the help of these irradiation we can destroy the microorganisms by fragmenting their DNA molecules.
- This irradiation process is also referred as cold sterilization.
- Source:-
- Lambda rays are obtained from radioactive isotopes Co60 & Cs137.
- Gamma radiations produce desired effect only during irradiation of food & have no effect after removal of source.
- Dose of 50-100k rad can enhance the shelf life of fresh meat cuts & poultry by 19 days.
- Dose of 4-5 Mrad can sterilize pork, poultry & fish.
- Among non ionizing radiation UV rays of 2650A are bactericidal.

GRAS(Generally Recognised As Safe):-

- **Acetic acid & lactic acid-bacterial inhibitor.**
- **Acetate & sorbate-yeast inhibitor.**
- **Citric acid ,Propionic acid ,benzoic acid ,sorbic acid-mold inhibitor.**

Reference :-Outlines of Meat Science and Technology

BD Sharma

Photos:-<https://images.app.goo.gl/VmgCrdHFVC243KBs8>

<https://images.app.goo.gl/YMMYwYgsPn5jy3f9>

THANK YOU EVERYONE

