

## Meat Canning Technology

**Canning** is the method of food preservation in which food contained in permanent sealed container is subjected to an elevated temperature for a definite period of time and then cooled.

The spoilage micro-organisms present are destroyed by heat and the hermetic seal of the container prevents fresh contamination.

All micro-organisms that might have survived are unable to grow because of unfavorable conditions prevailing inside the container.

### Advantages of canning

- Keep as much as possible of the original chemical, physical and sensory characteristics of meat
- Allow storing or transporting in normal environmental conditions.

### Commercial heat treatments

**Blanching:** Blanching is applied to inactivate enzymes in products receiving further heat treatment. For meats, volume reduction usually occurs. It is also used to eliminate gas from the tissues or simply to provide an initial cleaning of the food material. Blanching temperature is around 65°C.

**Cooking:** Cooking is applied to improve sensory characteristics of the food material, although it also destroys a number of micro-organisms and inactivate some enzymes. It takes place at around 85°C.

**Pasteurization:** Pasteurization destroys pathogenic vegetative cells, but certain heat-resistant microorganisms and spores can survive. Pasteurized foods have short shelf life even at refrigerator temperatures. Pasteurization temperatures are 140 to 150°C for 1-45 seconds or 70-73°C for 15-20 sec.

**Sterilization:** Sterilization destroys vegetative cells as well as spores; the shelf life of sterilized foods is considerable extended even without the application of additional preservative methods. Time-temperature relationship of the sterilization process depends on the thermal resistance of a given microorganisms, taken as spoilage indicator. *Clostridium botulinum* and *Clostridium perfringenes* are good spoilage indicators for meat products.

**Commercial sterilization:** A treatment aimed at destroying all pathogenic and most spoilage organisms at the cost of minimum damage to food texture and nutrients.

## **Steps of canning**

1. Preparation of raw materials
2. Filling-----0.3-0.5 cm headspace
3. Syruping and brining
4. Lidding and clinching
5. Exhausting and Vacuuming-----82-96°C
6. Sealing
7. Heat processing
8. Cooling---43°C
9. Labeling
10. Packing

## **Preparation of raw material**

- The preparatory operations required depend upon the state (i.e. fresh or frozen) and form (carcass, portion, boned etc) of the raw material as well as the type of end product.

## **Thawing**

- During thawing the protein and the cellular structure is altered, which result in a decreased water retention in the tissues causing loss of fluids by exudation.
- Shrinkage or losses of 1-5% occurs.
- Microbial activity increases rapidly as the temperature rises and nutritive matter in the exudative becomes available.
- To minimize microbial growth, the meat temperature should not exceed 4°C during thawing.
- Thermal energy must be applied to thaw frozen meat.
- The application of microwave induces internal heating that can be very rapid.

## **Boning, cutting & trimming**

- Manual operations
- Should be carried out rapidly to avoid increase in microbial level

## **Brining and Curing**

- Salting offset shrinkage and subsequent toughening of texture that may occur during thermal processing
- It also permits the use of less severe thermal processes to attain commercial sterility
- Addition of nitrite or nitrate to brine add benefits of fixing the color of myoglobin to a desired pink and reduce the severity of thermal process.
- Precooking depend on final product.