FISH CANNING

Dr. P. SANTHANAM
Assistant Professor
Marine Planktonology & Aquaculture Lab.,
Department of Marine Science, School of Marine Sciences
Bharathidasan University, Tiruchirappalli-620 024, Tamil Nadu.
E-mail: santhanam@bdu.ac.in
Website: www.mpalbdu.weebly.com

CANNING

Canning is a method of preserving food in which the food is processed and sealed in an airtight container.

The process was first developed as a French military discovery by Nicoles Appert in 1975. After his inventor the process come to known "Appertisation"

The packaging prevents microorganisms from entering and proliferating inside.

CANNING

Heating the food in a sealed container which preserved the food provided it was not reopened or the seal did not leak

The process under went several radical changes in course of time, most important of which was the replacement of the containers with tin plated mild steel canisters, from which the names “cans” and “canning” where derived, which are accepted all over the world today

CANNING

Louis Pasteur (French Scientist) discovered that it was a sort of microscopic growth are responsible for spoilage of food stuffs

The microorganism are destroyed by heat and if their further entry into the food material is prevented, the food is preserved without spoilage for a long time

The process of heat treatment of foods to inactive spoilage microorganisms is known as "pasteurisation".

CANNING

The process of canning consist in sealing the food material hermitically (air-tight) in cans and heating under steam-pressure for destroying the bacteria. Since the seams are air tight, entry of microorganisms and oxygen from outside is completely prevented

The heat treatments also inactivates the enzymes responsible for causing spoilage and this also contributes to the preservative action

CANNING

Advantages

Canned products are that they can be stored at ambient temperatures and if the processing is carried out the properly

They remain in good condition even for years

Since the material gets sufficiently cooked during the processing stage, it can be consumed with out any further elaborate preparation

Canned foods are inaccessible to insect, pests and microbial contamination from outside and impermeable to atmosphere gases

CAN MANUFACTURE

98 to 99.75 percent is steel which is coated with tin the proposition of which varies from 0.25 – 2 % depending the methods of eating employed

There are two method usually employed

- The hot dip
- Electrolytic methods

CAN MANUFACTURE

The hot dip taking up comparatively larger quantities of tin but working to be cheaper then electrolytic method

Steel plate (usually 0.01/0.254mm thick) is passed in succession through a bath of molten tin and in between two heated rollers which latter render the tin coating uniform and wipe down any excess tin adhering to the sheat

When the can is to pack fish in aqueous saline media, acid resistant (AR) sulphur resistance (SR) lacquer is applied on one side of the sheet and baked

Body blanks are cut mechanically from this sheet, bent into shape on a roller and edges bent in proper directions to hook against each other to form the side seam

The bent ends are mechanically pressed tight and solder applied along the seem ensuring that the lacquered side come inside

CAN MANUFACTURE

Maximum permission limits of impurities in the steel plate used for cans are:

Carbon	0.05 – 0.1%
Manganese	0.3 – 0.5 %
Phosphorus	< 0.015%
Sulphur	0.03%
Copper	0.06%
Silicon	0.01%

CANNING PROCESS

Sterilisation

- Cans filled with material and sealed are sterilized under the steam pressure
- Pressure of steam and heating time required for sterilization depends upon size of can food material packed (whether solid, liquid or mixed) and size of food pieces etc.,

CANNING PROCESS

Peeling and deveining

- Fresh prawns are peeled and deveined carefully
- Peeled meat is thoroughly cleaned and washed free of dirt, shell particles, vein bits and extraneous matters.

CANNING PROCESS

Blanching

- The peeled and deveined meat is taken in wire basket and dipped in boiling 10 % brine for 4 to 8 minutes.
- Incorporation of citric acid at a level of 0.1% in the blanching brine has been recommended but this is not absolutely essential.
- The meat is gently agitated during blanching to ensure uniform curling etc.,
- After the required blanching, the wire baskets are taken out, the brine drained off, the blanched meat transferred to clean stainless steel or aluminum trays and cooled under the fan.

CANNING PROCESS

Purpose of blanching

- It causes shrinkage of the meat expelling part of the water content
- It produced curling of the meat imparting of attractive shape to it
- Its liberates the characteristic pink pigments of the most important of which are astacene and astaxanthin from their losses combination with protein combination with corotenoides get denatured by heat giving the meat on attractive carroted colour
- It inactivated the enymes and complete destroyes the microorganism present in the meat

CANNING PROCESS

Size grading

- The next step in canning is size grading for which machines are available.
- Manually using sieves.

CANNING PROCESS

Weighing and filing

- The graded meat weighed in lots of 128 gm in to cleaned lacquered cans of size 301 x 206
- Boiling 2% brine containing 0.1% citric acid is then added to the can leaving a head space 5-10 mm

CANNING PROCESS

Exhausting

- The cans filled and passed over a conveyor belt moving through an exhaust box, which is tunnel into which steam is injected from below the cans.
- The speed of the conveyor is so adjusted that the cans take 8-10 minutes to reach the other end.
- Purpose of this step is to drive away any air bubbles entangled in between the pieces of prawn and to raise the temperature of the can and contents above 95^{o}c.

CANNING PROCESS

Seaming

- As soon as the cans emerge at the exit end of the exhaust box.
- They are double-seamed in machine.

CANNING PROCESS

Retorting/sterilizing

- The sealed cans are arranged in crates mad up of mild steel bars of size suitable to be easily lowered in to the retorts.
- The steam pressure allowed to rise as quickly as possible to 0.7kg/sq cm (101bs/ sq. inch) at which it is maintained for 18 min.

CANNING PROCESS

Cooling

After processing, the steam is cut off, pressure in the retort is slowly released, the retort opened, the crates of cans lifted out with the help of the crane and plunged suddenly in to previously chlorinated ice water

CANNING PROCESS

Drying and labeling

- The cooled cane are then allowed to drain and dry
- If necessary, they are wiped dry after cooling and labeled.
- The cans are then packed in corrugated fiberboard boxes and strapped for export

CANNING PROCESS

Standards for canned prawns

- Brine shall be clean not stronger than 3.5%
- Citric acid in brine shall not exceed 0.2%
- Vacuum inside the can shall not be less than 10 cm of Hg
- Head space shall be 5-7.5 mm
- Drained weight shall not be less than 65% of the water capacity of the cans

CANNING PROCESS

Standards for canned prawns

- Maximum limit permissible for disintegrated piece is 5%
- arsenic – 1ppm
- lead – 5ppm
- copper – 20ppm
- zinc – 50 ppm
- tin – 250 pm
- No microbial activity shall be detected