

# THERMAL PROCESSING OF FISHERY PRODUCTS



## Canning methods for Fish and Shell fish

- Methods vary depending on type of raw material
- Main differences preliminary blanching and filling medium
- Pre-processing requirements also vary depending on raw material
- Shrimp hot blanched in boiling brine
- Sardine and mackerel cold blanched in brine followed by steam cooking
- Tuna preliminary steam cooking under pressure
- Bivalves depuration



- OTS SR 41/2 oz (310x203) cans used
- Net weight 210g
- Filling weight sufficient to yield declared drained weight – statutorily fixed as a % of net water capacity of can

#### Sardine

- Generally canned in oil, brine, sauce
- Natural pack
- Sardinella longiceps only species used for canning
- Highly fatty fish properly iced until processing
- Raw fish should not be ice stored for > 2 days



- Preprocessing washing scaling, heading, removing fins and tails and eviscerating
- Natural pack:

Whole sardine – heading, gutting – washing and brining – filling in cans – exhausting and seaming – heat processing – cooling – labelling and packing – storage

- Cold blanching in 15% NaCl and 1% citric acid for 15 min
- Filled in tall cans (301x409)
- Water exuded from fish during heat processing itself acts as medium
- Heat processing 121°C for 45 min- 1 hr depending on pack size

- Canning in oil/brine/sauce:
- Whole sardine heading and gutting washing and brining- filling in cans precooking in steam filling with medium exhausting and seaming heat processing cooling labelling and packing storage
- Cold blanching 15% brine for 15 minutes
- Pre-cooking essential to avoid formation of oil- water emulsion or dilution of medium during heat processing – excess water drained off
- Medium added hot
- Heat processing 121°C for 45-60 min depending on can size

#### Tuna

- Light meat and white meat varieties used for canning
- Black meat usually not used
- Skipjack common

Whole tuna – thawing, if frozen (eviscerating and cleaning, if fresh) – cooking in steam – cooling – dressing – size cutting – packing in cans – addition of brine (addition of solid salt – addition of hot oil) – exhausting and seaming – washing – heat processing – cooling – labelling and packing - storage



- Fresh, fresh iced or frozen tuna used
- Break off head remove fins peel off skin split fish dorso ventrally – remove bones and dark red meat lying along lateral line
- Size cutting into pieces
- Steam cooking 115 °C until surface of central bone in the thickest part attains 90-92 °C 1-2 hrs (2-3 kg) to 6-7 hrs (45 kg up)



- Canning in oil sprinkle solid salt @ 2-2.5% on surface of meat – add hot oil
- Canning in brine add hot brine
- Heat processing at 121 °C for 50-60 min

### Shrimp

- Wet pack canned in brine popular
- Dry pack
- Penaeid shrimps
- Whole shrimp peeling and deveining cleaning and waste removal blanching and surface drying filling in cans addition of brine exhausting seaming heat processing cooling labelling and packing storage

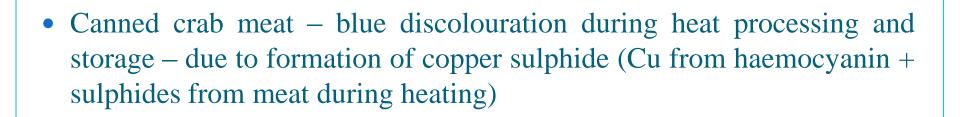


- Shrimp spoils rapidly at ambient tropical temperature iced immediately after catch and delivered to cannery
- Immediate washing separation from ice
- Discoloured and broken/bruised pieces sorted out
- Well iced through out the process
- Blanching 8-10 min in hot boiling 6-8% brine
- Filling medium -2% hot brine with 0.1% citric acid
- Heat processing 121°C for 15 min

#### Crab Meat

- Actively live mud crab *Scylla serrata*
- Meat quality poor in sluggish and dead crabs

Live crab – removing claws, legs, carapace, gills – splitting carapace into 2 sections – keep in ice-cold running water – blanching in hot brine – cooling in ice-cold water – picking the meat – inspection for shell pieces – packing in cans – adding brine – exhausting and seaming – washing – heat processing – cooling – labelling and packing - storage



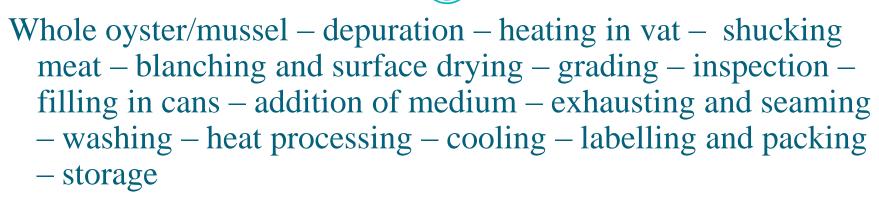
- Thorough bleeding of meat in ice-cold running water—reduces level of Cu
- Claw meat, leg meat, joints of shoulder meat high incidence of blue discolouration due to poor blood circulation thorough bleeding after breaking joints followed by brining meat picking cutting off meat at joints removing epidermis packing along with body meat (as required)



- Hot blanching in 5% boiling brine until meat becomes firm for 10-15 min
- Filling in cans with a parchment lining inside
- Medium hot brine 2% with 0.1% citric acid and 0.5% EDTA
- Heat processing at 121 °C for 15-30 min

#### **Bivalves**

- Oyster/mussel meat
- Filter feeders stomach contains sand and other gritty
  matter harbour high bacterial load including pathogens
- Depuration
- Live depurated animals used for canning
- Oyster *Crassostrea madrasensis*
- Mussel Perna viridis and Perna indica
- Collected from natural habitat or cultured



- Live depurated animals cleaned under a spray of water
- Heated in open vats until they open up
- Hot blanching boiling 5% brine for 5 min
- Surface drying keeping on mesh topped table under air blast
- Heat processing at 121 °C for 15-30 min