



# Principles and Preparation of fish paste products

1. Minced meat technology
2. Surimi production
  - selection of raw materials
  - Manufacturing of surimi
  - Role of cryoprotectants
  - Grading of surimi

## Some Japanese fish paste products are:

1. Kamaboko – Steamed product
2. Chikuwa – Broiled product
3. Hampen – Boiled product
4. Satsuma age – fried Product
5. Fish Ham –
6. Fish Sausage

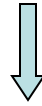
# Kamaboko (fish cake)



- **Kamaboko** is a type of cured surimi, a Japanese processed seafood product.
- Various white fish are pureed, combined with additives such as MSG, formed into distinctive loaves, and then steamed until fully cooked and firm.
- The steamed loaves are then sliced and served unheated (or chilled) with various dipping sauces.
- When the surimi is combined with other ingredients, mixed or kneaded, and steamed, various fish gel products called **kamaboko** (fish cakes) are produced.

# 1.Itasuki Kamaboko

Surimi

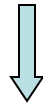


Addition of Additives

(Common salt 3%, wheat starch,  
potato starch, corn starch (5-10%))



Grinding(30-40 min)



Fixing

(paste is fixed on the wooden plate)

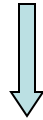


Good kamaboko is white, smooth in appearance with elastic structure

Inner core  
temp-75° C

- Steaming

- (80-90 min for large size, 40-60 min for medium, 20-30 min for small size.

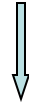


- Cellophane,  
polythene

Packing,  
ready to use

## 2. Chikuwa

Surimi

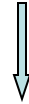


Mixing(ingredients)



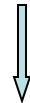
Moulding

(around brass rod/bamboo)



Broiling

(over a furnace 4-5 min)



Chikuwa

It is hollow in shape and good quality chikuwa is white inside and brown outside



### 3. Hampen:



Surimi



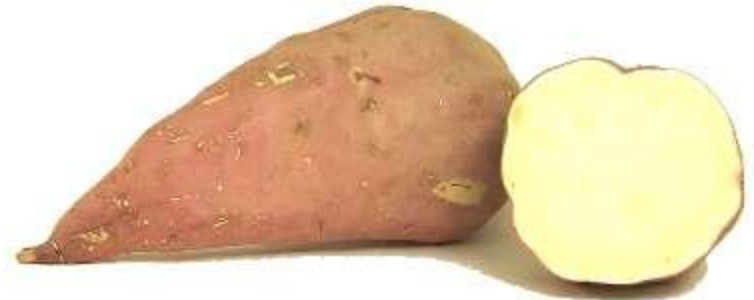
Japanese Yam +



ingredients and



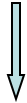
boiling



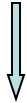


## 5. Satsuma-age / Tempura:

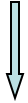
Fish paste mixed with ingredients,



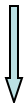
moulded to different shapes  
(round, triangular, square etc)



Frying in oil at 175-180°C



Cooling



Packing



# Fish sausage

- **Sausage** – Greek word ‘Salsus’ means meat salted & preserved in cleaned animal intestine.
- ground fish meat blended with ingredients, stuffed into suitable casing material & heat processed.
- Texture of sausage depend
- on grade of surimi.
- **Advantages :**
  - Any type of fish can be
  - used.



- Identity of fish used is lost, facilitating utilization of different low economic value fish.
- There exists scope for alteration of flavour, texture & taste of the final product.
- Production is economically viable
- *Fish :*
- Lean fish is suitable than fatty fish.
- Color white & good gel forming ability.
- Croaker, threadfin bream, marine cat fish , by catch fishes etc. are found suitable in India.
- ***Ingredients for Fish sausage:***

<b>Ingredients</b>	<b>Percentage</b>	<b>Function</b>
Minced meat	70%	
Salt	2%	Extract myofibrillar protein & gives taste.
Sugar	1%	Cryoprotectant. Gives taste, soften texture.
Starch (corn & potato)	9%	Avoid water separation & gives firmness, elasticity. Binding agent.
Polyphosphate	0.2%	pH modifier. Anti-denaturant.
Spices (chilli powder, pepper, garlic, ginger, coriander)	2%	Stimulates appetite, flavour enhancer. Have medicinal property. Mask fishy odour & act as preservative.
MSG	0.2%	Enhance taste/flavour
Preservative (pot. Sorbate, sorbic acid, fat coated sorbic acid)	0.2%	Prevents spore germination, growth of veg. cells, & other micro organisms.
Colour solution	2% carmosine 3% ponceau-4r	Gives attractive colour.

Antioxidant		Ascorbic acid/sodium ascorbate.
Cold water	10%	Uniform mixing
Fat/veg oil	5%	Emulsifier, enhance taste. Prevent sticking to casing.

- **Casing :**
- **Natural** :- Goat /sheep intestine
- **Synthetic** :- Polyvinylidene chloride casing.
- **KREHALON'** -- Transparent, shrinkable & water proof film. Melting point is 160°C.
- Stable to fat, organic solvent and hard to break, tear/puncture.
- Shrinkability of the film makes possible tight packaging of sausage.

- **PROCESS :**

1. **Dressing of fish :**

- Heading, gutting & filleting.

2. **Meat separation & mincing:**

- Meat separated from inedible parts like bones, skin, fins, scales etc. using meat picking machine.
- Separated meat passed through mincer for mincing

3. **Water washing & dewatering**

4. **Mixing with additives :**

- meat mixed with additives in a silent cutter (2-3 min).
- chilled water necessary to minimize increase in temp.

- **Stuffing :**
- Stuffing the paste into suitable casing.
- By hand stuffer or by semi automatic stuffer.
- Natural casing is clean intestine of animal (sheep or goat).
- Synthetic casing is polyvinylidene chloride casing
- **Ringling :**
- sealing both ends of casing with Al wire.
- Pressure applied during ringling.
- **Heat processing :**
- Boiling, cooling, re-boiling & air drying.
- boiled in water at 90°C for 50-60 min

- Kill m.o. product also cooked.
- cooled in chilled water for 20 min (5–6° C)– inactivate thermophiles.
- Re-boiling at 100°C for 30 secs. –prevent wrinkles
- Natural casing – 70° C for 25–30 min.
- **Storage & distribution :**
- At refrigerated temp.
- Shelf life : Natural casing – 10–12 days
- Synthetic casing – 20 to 25 days
- **Spoilage in synthetic casing :**
- Gas formation with or without swelling (mesophilic veg cells).



- Discoloration or spot formation (yellow, black, orange) & softening (thermophiles)
- Acid production – meso & thermophiles
- Spoilage can be avoided by using proper disinfectant in cooling water.

- Spoilage of sausage in natural casing are



- Slime production
- Contamination with fungi
- Slime production is due to intrinsic microbial load.

## 4. Fish Ham:

- Mixture of fish paste & quality animal/ fish meat.
  - Surimi(Allaska pollock)
  - mixed with additives like salt, sugar, spices, color, preservative, MSG, starch, soy protein,
  - oil & chilled water,
  - ground to fine paste.
  - Animal meat (sheep/goat/bovine)
  - curing of animal meat with
  - mixture of sod. nitrite,
  - sod chloride, & sod tri poly phosphate.
- for 48 hrs. at 2° C



fish paste to cured meat at 2:1

- The paste is stuffed in casings (500g) & sealed
- Heated at 85–90<sup>0</sup>c for 40–60 min
- Cooling in chilled water for 30 min.
- Freezing & frozen storage. Upto 20–22 days.
- **Curing of red meat :**
- Red colored meat when heat processed, turns to grayish which is unacceptable.
- to keep red color intact after heat processing chemicals like Sod nitrite → 200 ppm (200 g for 1Kg meat), Sod chloride → 2% & STPP → 0.2% added