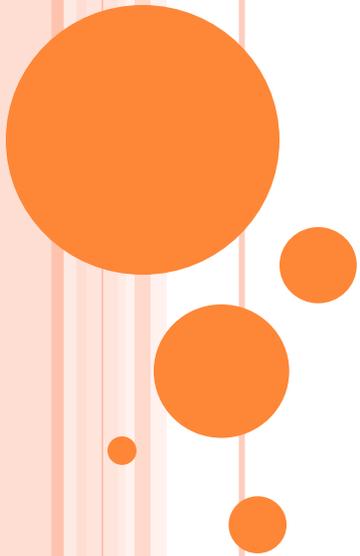


IMPORTANT FISHERY BY-PRODUCTS

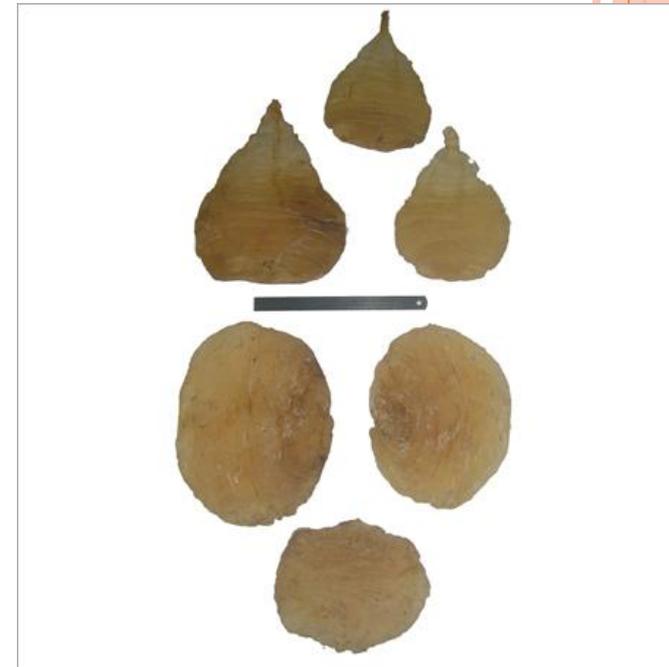


FISH MAWS AND ISINGLASS

- Air bladder/swim bladder of fish consists of several membraneous layers in the abdominal cavity below vertebral column.
 - Layers rich in collagen.
 - Cleaned & dried air bladder
 - is called Fish maw.
-
- Fish maw on refining yields
 - Isinglass – excellent RM for good
 - grade gelatin or glue.



○ **Isinglass**, or Ichthyocolla, a preparation from different species of a Russian fish, called sturgeon, It may also be produced from the air-bladders of the cod, or gadus, as well as from fresh Waters fishes.



○ **Processing of Fish maw :**

○ Air bladder → washed well in water → scrapping off outer layer → split open longitudinally → washed well → dried under sun to moisture level of 15% → Fish maw



○ Processing of Isinglass :

- Fish maw immersed in water → becomes soft → soaked in water for several hrs. → cut into small pieces → rolled between water cooled iron rollers → convert into thin strips or sheets , 3-6 mm thick → further compressed into ribbons (about 0.4 mm) → ribbons are air dried → rolled into coils → Isinglass

○ Uses:

- Isinglass swells in water & produce a fibrous str. Not present in other gelatinlass used
- An excellent, cement, called ARMENIAN or DIAMOND CEMENT, is made with isinglass,



- which is valuable for mending glass, china, and porcelain vessels,
- Used as a clarifying agent for beer, cider, wine, vinegar etc.
- Isinglass also used as an adhesive base
- Dissolved in acetic acid, forms strong base useful in glass or pottery.
- Used as sizing agent in textile.
- Used as an ingredient in Indian ink.
- Use as an egg preservative



PEARL ESSENCE

- A suspension of crystalline guanine in water or an organic solvent.
- Chemically 2 amino-6-oxypyrimidine (C₅H₅N₅O) belongs to group known as purine bases.
- Combines with collagen & Ca phosphate yielding a silvery white shining.
- Guanine is an iridescent material found in epidermal layers & scales of most pelagic fishes like oil sardine, mackerel, herring etc.
- Guanine particles deposited inside soil beads, an optical effect of real pearl is obtained.



- In crystalline form, guanine reflects & refracts light, thus acts as a camouflage to fish.

- **Isolation :**

- Guanine deposit on fish scale is more readily recovered.

- Freshly removed scales collected → washed to remove adhering foreign particles.

- Epidermis obtained is also washed along with scales.

- Scales preserved in 10-15% brine → brine drained off & scales squeezed in muslin cloth bags → compressed → compressed mass stored at 0°C for several weeks → scales should not dry



- Can be prepared as an aqueous/non-aqueous suspension.
- **Aqueous suspension :**
- Washed scales agitated with min qty of water containing ammonia in an agitator → mixture passed through a strainer to remove scales → the pearly substance present as a suspension in the liquor is purified by settling in a cool atm. →
- guanine settles & supernatant decanted → replaced with fresh ammoniacal water → Process repeated until guanine crystals are well purified → 0.3% salicylic acid used as preservative.



- **Non-aqueous suspension :**

- Suspend guanine in organic solvent like acetone, amyl acetone, chloroform & carbon tetrachloride or acetic acid etc.
- Also presented as thick paste of crystal suspended in viscous liquor of cellulose in amyl acetate.



- **Uses:**

- Most imp use in the manufacture of artificial pearl.
- Used as a spray or dip for several items to impart iridescent sheen reminiscent of pearls.



- Used on diverse articles eg. Shoe, pencil, fishing rods, spectacle frame, walking stick, ash tray, vanity bag, book cover.
- Also used in finishes for textiles.



GELATIN

Protein that lacks an essential amino acid, tryptophan.

Hence can't be considered as sole source of protein in animal & human nutrition.

High source of lysine & methionine.

Extracted from skin & bones of fish.

Extraction

Raw fish skin → washed in running water (3–4 hrs) → draining off water → soaked in dilute NaOH solution (0.5% conc.) for 6–8 hrs. → low alkalinity maintained to avoid swelling → washed in running water



for 3–4 hrs. → macerated in soln of sulphuric acid (3 times) → washing in running water → extraction carried out by adding 2 parts of water & heating to 0–80° C (30 min each).

Uses :

- i) Used in food industry as gelling, stabilizing, emulsifying, dispersing or thickening agent.
- ii) Used in photo engraving & chemical etching of metal parts.
- iii) Application in optical industry in formulation of coating for light sensitive materials like blue print papers.



FISH GLUE

Made from fish skin & head.

Fish can be preserved in salt (if short period) or by drying (if long period) before processed to glue.

Fish gelatin and fish glue are more or less the same except that the former is of a high grade , light in colour and yields solutions that are reasonably clear and sweet.

○ **Raw material :**

○ Shark, haddock, Cod, Hake & pollock.



Fischleim, flüssig
Fish glue, liquid



Processing :

Glue from fish skin :

Skin washed & soaked in fresh water (1-2 hrs to 18 hrs for salted skin) → washed skin immersed in dilute solution of caustic soda (0.2%) or saturated lime → open fibre bundles & remove cementing material → neutralized by HCl & washed in cold running water → skin swollen → treated skin transferred to steam jacketed double bottom cooker → covered with equal wt of water → heated with steam → small amt of acetic acid is added → hasten the hydrolysis of stock into glue & act as catalyst → cooking for about 8 hrs → glue liquid drawn off → a second run may be made in similar way.



Liquid glue concentrated in open heated pans at atmospheric pressure till it reaches 50-55% solid → cooled in a cooling box (below 15°C) → coagulated jelly type glue cut into moderate size → dried in dryer → small quantities volatile essential oils added to preserve the glue & to mask fishy odour.

Glue from fish head :

Fish head processed fresh → sulphurous acid/sod bisulphite added → cooking of skin → glacial acetic acid added → useful to soften the head bones → large amounts of preservative & oil needed.



Properties :

- They are generally liquids at room temperature.
- It has good resistance to solvents and heat.
- It has good adhesion property to a wide variety of surfaces including glass, metal, wood, cork, paper and leather.
- It is water soluble making it easy to thin and clean up.

Uses :

- i) Used in furniture, box making, sizing, special cement.
- ii) Used in production of half tone plates for photo engraving, book binding, small repair work.
- iii) Used to size cloth or straw hats.



