



PRINCIPLES OF FISH PRESERVATION


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Introduction

- ❖ Main aim is to minimize the growth of microorganisms during the storage.
- ❖ Fish perishable in nature.
- ❖ Local glut in good season.
- ❖ Distance of farms from market, lack of transport facilities
- ❖ Preservation necessary
- ❖ Keeping fish fresh for long with minimum loss of flavor, taste, nutritive & digestive value



Things to understand..

- Composition of fish
 - Why fish is perishable
 - Methods and principles of fish preservation
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Composition of Fish

- Proximate Composition:

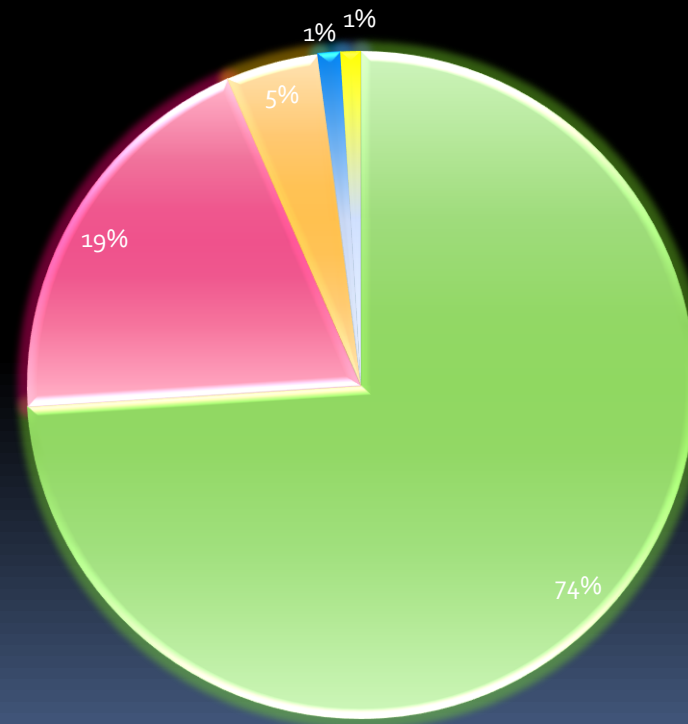
Moisture	-	60-80 %
Crude Protein	-	18-20 %
Crude fat	-	0.5-19 %
Minerals (ash)	-	0.5-1.5 %

- Minor components: Glycogen, sugar, sugar phosphates, nucleotides, vitamins, cholesterol, haemoglobin, myoglobin, other pigments, non-protein nitrogenous substances, enzymes, hormones, sterols, phospholipids, hydrocarbons and many other substances.

Average Proximate composition of fish

Chart Title

Moisture Crude protein Crude fat Minerals Miscellaneous




What makes fish different??

- High amount of tri-methyl amineoxide (TMAO)
- Variations in lipid content
- Highly unsaturated fatty acids
- Appreciable amount of ω -3 fatty acids
- Low carbohydrate content




Reasons for spoilage

- High amount of trimethyl amine oxide (TMAO)
 - Lipids with high unsaturation
 - Presence of non-protein nitrogenous compounds
 - Low carbohydrate content
 - Low postmortem pH
 - Autolysis and Bacterial degradation
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Preservation techniques


- Curing: Salting, Drying and Smoking
 - Chilling
 - Freezing
 - MAP (Modified atmospheric packaging)
 - Canning and retort pouch packaging
 - Irradiation
 - Boiling
 - Fermentation
 - Marination
 - Freeze drying
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Principles of preservation

- Word 'preserve' means to keep safe, retain quality.
- Since fish is very perishable, it is necessary to preserve fish if not consumed or disposed immediately.
- Fish preservation is the method of extending the shelf life of fish and other fishery products by applying the principles of chemistry, engineering and other branches of science in order to improve the quality of the products.

Principles of preservation

- Chilling: By lowering the temperature to near 0°C
- Freezing: By lowering the temperature to sub-zero levels
- Curing:
 - ✓ By reducing water activity in drying
 - ✓ By reducing water activity and by osmosis in salting
 - ✓ By applying mild heat and chemicals like phenols in smoking

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- MAP: by creating unfavorable environment with changing gaseous environment
 - Irradiation: By damaging DNA and tissue cells by use of radiation
 - Canning and Retort pouch packaging: By applying high amount of heat (121°C).
 - Marinating: By lowering pH, by use of acid and salt
 - Boiling: by using heat
 - Marination: By using salt
 - Freeze-drying: By dehydration using sublimation.