



MICROBIOLOGY AND SPOILAGE FACTORS OF FISH

SPOILAGE OF FISH:

- ▶ Spoilage is the degradation of food such that the food becomes unfit for human consumption.
- ▶ Food can be spoiled by a number of means , including physical and chemical means.
- ▶ However , the most prevalent cause of food spoilage is microbial growth and residence in the food , which results in numerous undesirable metabolites being produced in the food that cause unwanted flavors and odors
- ▶ Fish has high nitrogen content but it doesn't contain carbohydrates.
- ▶ The microbial quality of fish ,especially shellfish is heavily influenced by the quality of water from which they are harvested.
- ▶ Unsanitized processing steps are principal culprits in fish products with high microbial loads.
- ▶ Bacteria on fresh fish are concentrated on the ,
 - ▶ Outer slime
 - ▶ Gills
 - ▶ Intestine

Spoilage factors of fish:

- Autooxidation that is oxidation of unsaturated lipids .
- Reaction caused by activities of enzymes present in the fish .
- Metabolic activities of the microorganisms .
- Flat fish gets spoiled more rapidly than round fish because,
- It undergoes rigor mortis more rapidly
- Deteriorate rapidly because of oxidation of unsaturated fats of their oils.

Evidence of spoilage

- It is very difficult to detect the spoilage of fish by seeing it
- Many tests such as,
 - Test for volatile acids
 - Volatile bases
 - pH
 - H₂S
 - Ammonia test
- Tests mentioned above gives the results very slow , so no particular test exists for indicating the spoilage of fish .
- FISH SPOILAGE:
 - Putrefaction that is breakdown of protein (Slime)
 - Sourness that is due to production of lactic acid (Discoloration)
 - Rancidity that is breakdown of fats (Rancid odour)

Types of spoilage

CHEMICAL SPOILAGE :

- The most common chemical action which causes spoilage in fish is the oxidative rancidity in fatty fishes
- Fish is characterised by a high level of polyunsaturated fatty acids (PUFA) and hence undergoes oxidative changes

MICROBIAL SPOILAGE :

- Fish spoilage is mainly due to action of bacteria .
- Bacteria is present in the surface of slime , Skin ,gills , and intestine of the fish
- In dead fish bacteria begins to invade tissues causing spoilage and production of undesirable compounds

ENZYMATIC SPOILAGE :

- Autolysis
- Spoilage causing substances are cathepsins, calpain, trypsin and chymotrypsin.

Microbial flora

- Slime on the outer surface of fish contains
- Pseudomonas ,Acinetobacter, Moraxella, Alcaligenes , Micrococcus , Flavobacterium , Corynebacterium ,Sarcina , Serratia ,vibrio, Bacillus
- Bacteria on fish from northern waters are mostly psychrophilic.