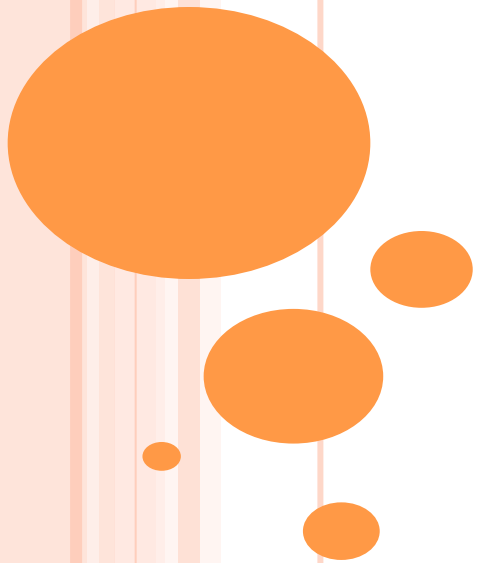# ASSESSMENT OF FISH SPOILAGE

METHOD OF ASSESSMENT

- Physical method

- Organoleptic method

- Chemical method

- Biological method

PHYSICAL METHOD

○ Torrymeter is a device that is placed vertical and provides a digital reading of the fish quality whether it is aged or fresh. From the digital readings or value of **Torrymeter**, we can estimate the freshness of fish.

○ A low value indicates the presence of a high number of the microbial population. 10 is the highest value for the freshly caught fish, and below 3 is the value of spoiled fish. The value of 6 on Torrymeter is acceptable by the consumer.

ORGANOLEPTIC TEST

- This test includes the quality assessment of fish by the sense of sight, smell, touch etc.
- We can check the quality of fish by a **sense of sight** by seeing the eyes, gills and skin surface like:
- The eyes should be clear and vibrant. If there is any discolouration around the eyes and cloudiness in the eyes, then it indicates that the fish is not fresh.
- The gills should be red-pink in colour.
- The skin should be shiny, not slimy.
- The skin or the surface of fish should be clear, and there must not be any discolouration.

We can also check the quality of the fish by the **sense of touch** like by touching the flesh and scales of the fish:

- The flesh should be tight, elastic, but not slimy.
- The scales should be intact with the skin.

We can also check the quality of the fish by the **sense of smell**:

- The smell of fish should be neutral and fresh. There should not be fishy, sour and ammonia-like smell.

BIOCHEMICAL METHOD

- **Proximate testing**: It is a prevalent method, in which the fish components like moisture, protein, lipid etc. are regularly checked from the time of fish harvesting. This method does not give a satisfactory assessment and thus not accepted.

- **Hypoxanthine value**: After the death of fish, break down of an **ATP** (Adenosine triphosphate) into ADP, AMP, IMP and finally into **hypoxanthine** occurs. The value of hypoxanthine increases during the storage of fish. Hypoxanthine value gives an estimate for the freshness of fish. A fish is considered to be spoiled when the hypoxanthine value reaches **7-8 micromoles/g**.

- **Trimethylamine (TMA) value**: Fish contains a considerable amount of trimethylamine oxide (**TMAO**), but when it gets spoiled, the TMAO reduces into **TMA**. The value of TMA with a level of **1.5mg / 100g** indicates that the fish is moderately spoilt.

BIOCHEMICAL METHOD

- **Ammonia production**: The production of ammonia indicates that there is an extent of spoilage.

- **Peroxidase value**: It helps in the measurement of **oxygen rancidity**. Peroxidase value less than 10 indicates the good quality of fish, but value more than 20 indicates rancidity.

- **Thiobarbituric acid value (TBA)**: It also helps us to determine the **oxygen rancidity**. TBA value less than 2, is accepted by the consumer.

BIOLOGICAL METHOD

○ It includes total plate count method (TPC), which is used in the quality assessment of fish by giving an estimate of bacterial presence. In this method first, grind the fish and then dilute the sample by following serial dilution. Prepare media for the growth of microorganisms present in the fish, where we can use both ordinary and selective media.

○ For the enumeration of microorganisms in marine fish, agar media is used whereas for the processed fish, tryptone glucose beef extract agar media is used. Other than this, selective media like SS-agar can be used for the detection of coliform bacteria (E.coli, Shigella sp, etc.) in the fish.

BIOLOGICAL METHOD

○ After media preparation, perform pouring method and incubate the plates for 24 hours at 35-37 degrees Celsius. Count the number of bacteria per plate, by multiplying with the dilution factor. Total plate count method thus gives a count for the bacterial population present in the fish, which can be pathogenic and non-pathogenic. Hence, total plate count method does not determine the edibility of the fish.