

INTRODUCTION OF FISH
MICROBIOLOGY AND PATHOLOGY
**Methods of Fish packing and
Transport**

- Two methods of packing are in vogue
- (i) Open system comprising open carriers with or without artificial aeration/oxygenation/water circulation and
- (ii) closed system having sealed air tight carriers with oxygen

- Before transporting to long distances whether in open or in closed system of transport fish are conditioned in order to rid them of excreta and to immune to subsist in a restricted area they inevitably liable to be subjected to during transport
- Feed type (animalcule-cladeocerans)
- Hapa (cloth) in pond
- Size and health of fish

- Various types of conditioning containers are used, namely boxes made of wire meshes, bamboo or cane wicker work, barrels or boats with perforated bottoms, temporary enclosures made of netting or bamboo matting cloth hapa etc.
- Clean natural water at a temperature of 20.5°C during conditioning fish should not be handled with bare hands lest the shine and scales covering the body be removed and thereby render them vulnerable to fungal and bacterial infections.
- Fry collected from the nurseries are kept in nets fixed in ponds on which water is splashed from all directions and the frightened fry pass excreta and vomit.
- After the fish have been properly conditioned they are ready to be transported.

Open System of Transportation

- Various structures either of earthen or metal structures have been used in fish transport.
- Improved open metal containers came into use and in fact, had an edge over earthen containers.
- These round vessels with a wide mouth, which can be closed with perforated pressed-in lids, the larger type being 53cm in diameter at the base 20cm at the mouth and 38cm high.
- To prevent denting and effect of insulation, wooden corens are used on the metal containers.

Closed system of fish transport

- In this system, the source of oxygen supply is not the open air to which the water surface is exposed but air or oxygen is supplied into an enclosed space above the water.
- Sealed metal containers with oxygen have successfully been employed for transporting spawn and fry involving long durations.
- The Fisheries Department of Manharashtra in Indian gets the credit for introducing polythene bags on an economic basis.
- Alkathene bags has also been widely used for fish transport.

Use of Chemicals in live fish transport

- The use of sedatives and disinfectant in the transporting medium have been identified. The sedating of fish brings in practical benefits by way of
- decreasing rate of oxygen consumption and reducing rate of excretion of carbon dioxide ammonia and other toxic wastes
- controlling the excitability of the fish and thereby reducing chances of injury
- reducing the time required for handling them
- These narcotics have intermediate potency, are readily soluble in both fresh and salt water, induce deep sedation within 10 minutes and are compatible with calcium

Antiseptic and Antibiotics

- The induction of infectious diseases, parasites, predatory insects and aquatic weeds along with fish consignments is a possibility that calls for adoption of prophylactic and quarantine measures
- involving the use of antiseptics, antibiotics and germicidal chemicals for the purpose of fish transport only short duration chemical baths to fish prior to transport may be desirable.
- An instant bath before transport may help in further transmission of infections in fish consignments.

International Restrictions binding Fish Transportation

- ECOWAS Trade liberalizations scheme.
- This scheme became effective as from 1st January, 1990, it allows free exportation of fish and other unprocessed good.
- Thus exporters of unprocessed fish are allowed free access to the ECOWAS market and therefore exonerated from custom duties and taxes, without any quantitative or qualitative restriction and without compensation for loss of revenue resulting from their exportation.
- However, proper documentation must be done including certificate of origin

EUROPEAN UNION HEALTH STANDARDS COMPLIANCE

- In July 1998, the EU began implementing health standards applicable to all countries that export or plan their production to its territories. In Nigeria the agency responsible for the inspection of food and drug is NAFDAC. (National Agency for Food Drug Administration and Control).
- Thus to export fish, NAFDAC must certify the fish fit for consumption in line with international standards. Specifically, the following should be taken into consideration when preparing fish for export to ensure compliance to standards and adequacy particularly to the EU.

- Infrastructure: building and surrounding road, access, railway and port loading facilities, electricity and water supply
- Materials used in the floors, walls and ceilings
- product movement from material reception to finished product storing
- Movement of packaging materials and other inputs
- production equipment including tables, knives, fish packaging and forklifts
- cold storage rooms
- water connections, water treatment, waste water treatment and disposals
- existing quality control: the personnel procedure and critical points

ENVIRONMENTAL ISSUES IN FISH EXPORTATIONS

- The concepts of sustainable development which was adopted by all the countries in the world at the 1992 Rio de Janeiro UN Conference on Environmental and Development (UNCED), committed signatories under Agenda 21 to the principle of sustainable development by balancing economic growth with care for the environment in the 21st century.
- This is due to the fact that consumers are increasingly having preference for products that have been produced in an environmentally sound, human and animal-friendly manner.

- Pesticide residue level
- Heavy metals in foodstuffs.
- Food Additives
- Food contamination by fungal and bacterial toxin
- Radiological contamination of foodstuff
- Chernobyl nuclear accident in Ukraine 1996, max permissible levels for the radiological contamination, 2011 nuclear accident in Japan
- Irradiation of foods
- Food Hazards and hygiene