HYGIENIC HANDLING OF FISH AND VALUE ADDITION

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND FARMERS’ WELFARE
DEPT. OF ANIMAL HUSBANDRY, DAIRYING AND FISHERIES
NATIONAL INSTITUTE OF FISHERIES POST HARVEST TECHNOLOGY AND TRAINING (NIFPHATT)
KOCHI, KERALA
Fishery resources

- Marine capture fisheries
- Fresh water lakes, reservoirs, rivers
- Estuaries, backwaters etc.
- Fish farming / aquaculture
Pre-independence scenario

- Limited to artisanal / subsistence fishery
- The quantity caught was consumed within the near localities
A paradigm shift in marine capture fisheries

- Introduction of mechanized fishing methods during 1950’s
- By Indo-Norwegian Project (INP the forerunner of this Institute-NIFPHATT)
INP intervention resulted in broad division of the sector subsequently

- Artisanal fishery
- Motorized – here mechanization is limited to propulsion alone
- Mechanized - Mechanization is used for both propulsion and fishing
- Factory ships – Here processing is also carried out onboard – Not common in India
Mechanization brought in some new issues

- More fish was landed than daily requirement in the localities
- Problem of dealing with this excess quantity landed than daily consumption
- A small portion could be sun dried – but possible only during dry season
- The rest left unattended/spoiled/discard or used as manure /poultry feed etc.
How to deal with this excess quantity?

- Development of good **fish handling practices** to minimize loss/wastage of fish
- Development of **modern preservation methods** – chilling, freezing, cold storage etc.
- Development of **fisheries infrastructure** on ice plants, freezers, landing centres / fisheries harbours with good amenities, cold/chill rooms, etc.
- Development of **Good transportation facilities** – insulated /refrigerated trucks, connectivity through better roads /rail etc.
Positive impacts of improved fish handling techniques

- Chilling/icing and freezing aided to the transportation /marketing of fish to interior areas
- Making fish available during all seasons
- Increase in fish eating population
- Increased export earnings
- More Improved/convenient fishery products
- Better returns to fishermen
Other impacts

• Mechanization and increased demand for fish resulted in over fishing
• More stress on fish biomass and marine ecosystem
• Gradual decline in marine catch over years
• More thrust given on aquaculture as an alternate source to meet the demand
• Increase in aquaculture demands more aqua-feeds
• Aqua-feeds produced from fish meal – again giving more fishing pressure
Handling requirements for aquaculture produce

• Fish, whether captured or cultured are required to be handled with utmost care
• Aquaculture produce are also marketed/processed/ transported to distant destinations
• Hence all handling and preservation practices are to be adhered to
• All basic infrastructure such as ice-plants/availability of ice, cold/chilled rooms, potable water, good road connectivity are to be provided near aqua farms
Cultured or captured, what’s the necessity for such extreme care while handling fish?

- Fish is one of the best protein source on Earth
- Few food products have comparable nutritional qualities on essential amino acids, essential fatty acids, minerals, vitamins, digestibility etc.
- At the same time it is one of the most perishable food item
- Hence utmost care should be given while fishing and subsequent handling/preservation
- Time and temperature are the two key factors
What makes the fish spoil?

- Digestive enzymes and other enzyme systems in the fish
- Microorganisms – mainly in intestine, gills, skin etc. of fish
- Enzymes and microorganisms act on fish and deteriorates it if not properly handled
How to reduce or control spoilage?

• By controlling the activities of enzymes and microorganisms
• Reduce fish temperature by chilling/icing/freezing
• Reduce bacterial and enzymatic load by:
  • Proper washing
  • Chlorination of contact surfaces
  • Removal of gut
  • Removal of gills
  • Maintaining personal hygiene
  • Cleanliness on all contact surfaces
Icing – the best method of chilling

- Temperature of fish required to be reduced to around 0°C using ice immediately on capture – from sea or farm
- Microbial and enzymatic spoilage activities are reduced at lower temperature
- Ice keeps the fish firm/stiff (prolongs rigor condition)
- Keeps the fish moist, shiny and attractive
- Ice is easily available, cheap and non toxic
Other requirements

- Landing centres with protection from sun, pests, birds, etc.
- Ice, chlorination and potable water availability at landing centres
- Raised platform and good drainage, insulated storage, insulated vehicle, boxes etc.
- Good road/rail connectivity to reach the final destination within the shortest time
Usual disposal/sale pathways

• By adopting to proper handling and preservation practices, the resources landed can be maximum utilized due to reduced spoilage until it reaches consumer

• Usual pathways to consumer include:
  • Selling in local / remote markets in chilled condition itself
  • Exporting from export houses mostly in frozen form
  • Reach processing centres for further value addition – currently only at a limited level

• The subsequent goal is to fetch maximum returns to primary producer and processor from the available resources landed

• This is possible with value addition

Varghese John, NIPPHATT
Value addition

“Any additional activity that in one way or another changes the nature of a product, thus adding to its value at the time of sale”

Value addition makes the fish more visible and acceptable to all populace
Why value addition?

- Ready to cook and ready to eat fishery products
- Increases the value
- More returns generated from the same quantity of fish
- More convenient products for consumers
- Minimum issues of waste disposal for consumers in urban areas
- More quantity and variety from a given quantity of fish
Why value addition?

- Utilization of unconventional fish varieties
- Attracting more consumers towards fish consumption
- Products for those who are afraid of thorns / bones in fish
- Products for those who don’t like fish smell/flavour but appreciates its nutritive value
- Increases the bulk of the product – eg: Batter and Bread crumbs - in turn reducing cost
Reduction of spoilage and addition of value - How to achieve?

• By improved infrastructure facilities on – landing centres/fisheries harbours, water, ice, storage, drainage, transportation etc.

• More primary processing centres – for fish dressing, value addition etc.

• But Improved facilities alone cannot bring in change

• Possible by changing the mindset of stakeholders—inculcating the necessity/importance of proper handling/preservation, hygiene, product development, product presentation etc.
Changing the mindset

- Possible through awareness creation:
  - Training programmes
  - Awareness campaigns
  - Group interactions
  - Special drives
  - Exhibitions/Fairs
  - Posters, pamphlets, brochures etc.
Changing the mindset

Varghese John, NIPHAFT
Changing the mindset

A fish for thought!

FISH - the best meal for human consumption

Fish is heart food
Thanks to its beneficial properties of Omega-3 fatty acids

Fish is comforting food
Thanks for its rich proteins and vitamins

Fish is kids and waters food
Thanks for its natural ingredients and minerals

Fish is for breeding
Thanks for its omega-3 fatty acids

Fish is for smooth skin
Thanks for its natural ingredients and omega-3 fatty acids

Fish is for strong bones
Thanks for its rich minerals and omega-3 fatty acids

National Institute of Fisheries Post Harvest Technology and Training

Varghese John, NIFPHATT
NIFPHATT’s interventions in such programmes

• NIFPHATT a Govt. of India Institute under the Department of DADF regularly conducts several programmes including hands on experience for the stakeholders

• The following messages are highlighted:
  • Complete utilization of resources already landed
  • Zero waste concept
  • Need to reduce fishing pressure on biomass
  • Benefits of value addition
  • Importance of self reliance and community development
Salient features of NIFPHATT’s training programmes

<table>
<thead>
<tr>
<th>Target Group</th>
<th>1) Fishermen/women Self Help Groups (SHGs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2) College/University students of Fishery Science/Food Technology/Microbiology etc.</td>
</tr>
<tr>
<td>Group Size</td>
<td>20 to 30 per batch</td>
</tr>
<tr>
<td>Sessions</td>
<td>Theoretical and hands on sessions</td>
</tr>
<tr>
<td>Venue</td>
<td>Mainly on-campus (Kochi and Visakhapatnam)</td>
</tr>
<tr>
<td></td>
<td>On-site also</td>
</tr>
<tr>
<td>Sponsored by</td>
<td>State Fisheries Departments, Their agencies, Fishermen Cooperative Societies, NFDB, NGOs in Fisheries sector etc.</td>
</tr>
<tr>
<td>Expected outcome</td>
<td>Equipping for self reliance</td>
</tr>
<tr>
<td>Accommodation</td>
<td>Dormitory level</td>
</tr>
<tr>
<td>Certificate</td>
<td>On completion</td>
</tr>
</tbody>
</table>
Self reliance is the pre-requisite for self respect
Expected outcome

• Complete utilization of landed resources
• Zero wastage
• Cleaner environment
• Hygienic and convenient products
• Increase in the outreach of fishery products
• More fish eating population
• Skill upgradation
• Setting up of small scale units by the beneficiaries
• Financial self reliance
• Socio-economic upliftment
• Community and gender development
• Healthy community and reduced malnutrition

Varghese John, NIPPHART
THANK YOU