

General Hygiene Measures in Local Fish Markets and Good Handling Practices in Myanmar

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Generally in many Southeast Asian countries, local fish markets are located in fishing ports or behind jetties along seashores where marine fish and shellfish are collected from fishers and sold to middlemen for distribution to consumers. Recently, local fish markets have received attention for the need to enhance quality control and traceability system in order that fish products would be acceptable among retailers and consumers. In local fish markets, there are many risks of acquiring and/or increasing bacteria on fish products especially during the various operating procedures, which could cause food poisoning to humans. In order to address such concerns, many local fish markets have now been undertaking various activities aimed at managing quality control and safety of fish products from landing to transport. This report introduces the importance of hygiene measures in local fish markets for marine fish products and provides an example of good handling practices in a local fish market in Myanmar, which could be useful for other local fish markets in the ASEAN-SEAFDEC member countries.

Importance of General Hygiene Measures in Local Fish Markets

Role of Local Fish Markets

Marine fishing activities have recently been generally concerned with difficulties in supplying stable daily amount of fish to meet the demands of retailers, which could be due to inclement weather conditions and migration or fluctuation of marine fish stocks, a situation which is different from agricultural activities. In addition, large numbers of local fisheries using small-scale fishing vessels are in operation because of abundant kinds of marine resources and favorable fishing ground environments with semi-tropical or tropical climate in the Southeast Asian region. Under such conditions, local fish markets have been developed in fishing ports or jetties along seashores to distribute the daily landed fish effectively to middlemen, fish processing companies, retailers, and local consumers. Local fish markets play an important role in the supply chain of



Fishing Vessels Mooring at the Annawar Aung Landing Site in Myanmar
(Photo: Akito Sato)

effective fish distribution from catching in fishing grounds to selling by retailers.

In general, selling fish products either through auction or 'face to face' transactions involves negotiation between the local fish market and middlemen. However, the negotiated prices depend not only on the general consumers' demand but also on the distribution or sale abilities of local fish markets and middlemen. From the negotiated prices of the fish products, the local fish markets usually pay benefits to fishers minus commission fee, so local fish markets are also important for fishers to realize certain favorable income, considering that small-scale fishers in particular, are not familiar with retail or food markets. In addition, local fish markets often play other roles such as fishing, fish processing and retailing by themselves, and providing services and provisions for fishers such as ice, water, fuel and to some extent financial support. Furthermore, since local fish markets have daily landing records from various fishing vessels, they have the potentials for improving the statistics of the region's fisheries and from the administrative viewpoint, for analyzing the daily fish data for research and evaluation of the fishery resources.

Risks on Hygiene of Local Fish Markets and Importance of Hygiene Measures

Fish is generally safe to eat and offers lower risk in terms of hygiene and from its effects to one's health compared with other foods, in fact, food poisoning from fish is very rare. Even the incidence of food poisoning caused by the tetrodotoxin in globefish or puffer fish could be avoided through appropriate handling measures. Although cases of food poisoning brought about by consuming fish are reported every year in many places, such cases are mostly caused by bacteria such as the *Escherichia coli*, vibrios and salmonella, which could be attached on fish and propagated along the supply chain from catching to landing, processing, distributing, and retailing.

Various handling activities such as landing, selecting, dealing, packing and distributing take place in local fish markets, where fish goes through many risk factors generating additional sources of bacteria. Therefore, the risk of propagating bacteria on fish through human hands, trays, buckets, market floor, waste water, bird droppings, among others in local fish markets could be relatively high. One of key important measures is to prevent attachment and/or the propagation of bacteria on fish during the series of activities in local fish markets. Thus, proper cleaning of equipments and facilities as well as frequent washing of hands are effective ways to avoid risking the hygiene of fish. Furthermore, accountability is already required for food safety nowadays, so that if incidence of food poisoning occurs in the supply chain of fish products,



The normal hygiene measure zone at the Annawar Aung Landing Site in Myanmar (Photo: Akito Sato)



The high hygiene measure zone at the Annawar Aung Landing Site in Myanmar (Photo: Akito Sato)

the concerned local fish markets are held responsible and should be able to explain their accountability. With this in mind, the development of manuals on hygiene measures, including maintaining cleaning records and periodical check records on facilities and equipment would be useful to ensure that hygiene measures are being undertaken by local fish markets.

In an effort to address such concerns, local fish markets in many places have been undertaking the required activities little by little within their limited operation/maintenance budgets, aimed at managing quality control and safety of fish during operations from the landing sites to consumers' table. Since hygiene measures involve not only the activities that deal with operations but also those focusing on the facilities/equipments, operational measures are most fundamental for small budget entities. Specifically, training on proper operations, fish handling and maintenance for persons concerned in local fish markets would be especially important, in which case on-site technical support from extension staff of central/local governments and resource persons are beneficial for improving and promoting quality control and hygiene measures in local fish markets.

Hygiene Measures for Local Fish Markets

Hygiene measures comprise two aspects: the essential measures for food safety and advanced measures mainly for retailers' needs. The levels of hygiene measures are influenced by the consumer market, to which the local fish markets are directly or indirectly selling fish products. **Box 1** shows examples of hygiene measures in local fish markets, mainly based on the practices of local fish markets in Japan.

Examples of Good Handling Practices on Local Fish Markets in Myanmar

Background of Hygiene Measures in Myanmar

Myanmar, with a long coastline of about 2,832 km and wide continental shelf of about 228,751 km², has favorable conditions and abundant marine resources for fisheries. The

Box 1. Examples of hygiene measures in local fish markets

- 1) **Operational measures**
 - i) *management of people concerned*
Clean hands, boots, and clothes, and health check of staff are recommended. Improving knowledge of staff on hygiene measures through on-site training are recommended.
 - ii) *management of water*
Freshwater supplied by waterworks or from wells in addition to seawater is used for washing trays and floor, preserving fish, etc. In utilizing seawater or well water, sterilizing water is recommended if necessary, depending on water quality.
 - iii) *washing facilities and equipment*
Freshwater supplied by waterworks or from wells is effective to reduce vibrios which are found in seawater. High-pressure water is effective to reduce bacteria even with small water volume. If possible, disinfecting by hot water is recommended. A most important measure is adequate drying of market floors, trays, etc.
 - iv) *preserve fish temperature*
Ice or iced water is used to preserve fish temperature. Efficient preservation of fish from landing to transport is recommended.
 - v) *check list and keeping records*
Keeping of operation records, cleaning records and periodical check records on facilities and equipment in addition to catch documentations are recommended in order to show that hygiene measures have been taken.
- 2) **Facility/equipment measures**
 - i) *fish handling floors*
It is desirable not to put fish directly on floors of fish handling areas, even if floors are often used for efficient handling. In these cases, some equipment measures are recommended to avoid external risks such as those caused by people, cars, birds, etc.
 - ii) *toilets*
Water supply equipment is essential to wash hands or long boots. Toilets should be maintained clean to prevent insect invasion.
 - iii) *landing facilities*
Landing wharfs and preparation/rest wharfs for vessels are best kept separate from local fish markets for good hygiene measures.
 - iv) *Drainage system*
Small-scale drainage facilities, with simple treatment of wastewater, are recommended especially when wastewater is contaminated or in order that the wastewater is not expected to be diffused with the seawater current.

country's total production from marine capture fisheries was about 1,680,000 metric tons in 2008. Traditionally, the people of Myanmar are used to eating freshwater fish, so that the country's marine fish products are mainly

Box 2. Outline of Activities of a Local Fish Market, the Annawar Aung Landing Site

Operator of local fish market: Domestic private company
Location: Yangon (along the river)
Area of fish market site: nearly 4 acres
License: 1999-present
Landing vessels: 130 fishing vessels
(Trawl net: 76, Purse seine Net: 38, Drift net: 4, Surrounding net: 4, Carrier: 8)
Main landing species: Variety of fish and shrimps
Handling volume: About 22 thousand tons per year
Staff employed: 131 male and 164 female
Main facilities: landing facilities (jetty), ice making machines, cold storage, water treatment system, facilities for fuel supply, facilities for freezing, offices, etc.

Box 3. Outlook on Hygiene Measures in the Local Fish Market focusing on Annawar Aung Landing Site

- 1) **Catch documentation**
This fish market as well as other local fish markets submits daily catch documents including vessel name, fishing area, catch by species, catch by weight and other relevant documents to the DOF of Myanmar. Based on the reports provided by local fish markets, DOF submits the Product Movement Document (PMD) to processing plants, while the catch certification documents are sent to importing countries, including the EU countries.
- 2) **Training on hygiene measures**
Training on fish handling for jetty workers, training on jetty operation for fisheries supervisor, and training on jetty management for fisheries executives have been implemented with the support of DOF of Myanmar. The Manager of the Annawar Aung Landing Site specifically mentioned that such training activities had enabled its staff to carry out the hygiene measures efficiently.
- 3) **Facilities and equipment in auction sites**
Fish and shrimps are sold mainly to middlemen through auction. During the auction, fish and shrimps are kept in trays or buckets with ice or iced water. Auction sites are divided into two zones: the high hygiene measure zone and the normal hygiene measure zone. The high hygiene measure zone which adopts the EU standards is mainly used for the auction of tiger shrimps. Although both auction sites are open air, the high hygiene measure zone is covered with nets and its entrances have facilities to disinfect boots.
- 4) **Handling of fish and shrimps**
This local fish market has tried to comply with the emerging requirements of foreign retailer needs, and has realized the high hygiene measure standards effectively through its efficient staff.
- 5) **Cleaning and putting things in order**
This local fish market is highly aware of cleaning equipment and putting these in order. This is mainly because of the training of its staff on hygiene measures.
- 6) **Water treatment system**
Facilities for water treatment system are installed in the local fish market to purify wastewater. Water treatment system is important as a criterion for high hygiene measures.

exported to many countries such as China, Thailand, Japan, Malaysia, Saudi Arabia, Hong Kong, Bangladesh, Singapore, the United Arab Emirates, and the United Kingdom. Improvement of local fish markets for marine fisheries had been advanced in Myanmar especially during the last decade to be able to adapt not only to the directives of the Department of Fisheries (DOF) of Myanmar but also to needs of foreign markets. For example, several local fish markets have been adopting hygiene measures to meet the standards of the EU for exporting fish products mainly to the United Kingdom.

Example of a Local Fish Market for Marine Fisheries Adapting the Hygiene Standards of EU

Many local fish markets for marine fish products in Myanmar have adopted the hygiene standards of EU especially on good handling practices. **Box 2** shows the information on one of such local fish markets, the Annawar Aung Landing Site. Moreover, the Outlook on Hygiene Measures in the Local Fish Market focusing on the Annawar Aung Landing Site is shown in **Box 3**.

Features of the Local Fish Market on Hygiene Measures

The Annawar Aung Landing Site is a local market which ensures that adequate hygiene measures are carried out not only in the high hygiene measure zone but also in the normal hygiene measure zone, where almost similar facilities and equipment are used. The same facilities and equipment are also being used in many other local fish markets in ASEAN countries. However, a very significant feature of the high hygiene measures found in this local fish market is mainly in its operations. Such practices including the devices used and persistent efforts offer suggestions for other local fish markets in the region to comply with the hygiene standards of EU within limited operational and maintenance budgetary allocations.

Discussion

Training on operations, fish handling and maintenance for persons concerned in local fish markets are especially important for improving and promoting quality control and hygiene measures in local fish markets. Based on the observations from the abovementioned local fish market in Myanmar, many local fish markets in ASEAN countries have the possibility and the capability of complying with the relatively high hygiene standards required by importing countries, through the devices used and efforts exerted mainly within their operations, even if operation/maintenance budgets are limited.

Way Forward

Considering that many local fish markets in the region remain without adequate hygiene measures especially those for distributing fish products in domestic/local markets, the observations from the abovementioned local market in Myanmar could set as examples. Local fish markets for distributing fish products among the ASEAN countries will also require adequate hygiene measures for food safety. Nevertheless, since hygiene measures are not mainly concerned with the scale and period of use of the facilities, it is crucial that guidelines on adequate hygiene measures should be developed for the local fish markets in the region. This is one way of promoting and supporting the implementation of support hygiene measures for the local fish markets.

References

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