COURSE TRAINING ON HACCP BASED PROCEDURES IN FISH INDUSTRIES

TRAINING REPORT

HACCP

HAZARD ANALYSIS CRITICAL CONTROL POINT

2ND & 3RD November 2016 – Marine Fisheries Department, Karachi

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ABSTRACT:

Hazard Analysis and Critical Control Point (HACCP) is an internationally recognized system for reducing the risk of safety hazards in food.

A HACCP System requires that potential hazards are identified and controlled at specific points in the process. This includes biological, chemical or physical hazards. Any company involved in the manufacturing, processing or handling of food products can use HACCP to minimize or eliminate food safety hazards in their product.

A Two-Days Training Course was conducted for the Junior Research Fellows of Centre of Excellence in Marine Biology at Marine Fisheries Department to give hands on knowledge to the students who aim to make careers in Marine Sciences.

The Two-Days Training Course comprised of Training Sessions and visits to various Seafood Processing Plants and Companies dealing in Seafood Export. These included Super Star Enterprises and Taj Companies.

The Training was designed by professionals of Marine Fisheries Department where the students were skilled with how HACCP plays an important role in the perishable items quality maintenance and what procedures does a commodity goes through to reach the national and international markets. It further added that how HACCP plays an important role in fisheries and seafood exports by keeping the laws and regulations of the country as first priority. HACCP also qualified the students to how a particular seafood item is processed and packed according to the demands of the clients.

The report is based on the learning experiences and what has been concluded from the training by the students.

BACKGROUND & INTRODUCTION:

Centre of Excellence in Marine Biology, University of Karachi accompanied their junior research fellows to Marine Fisheries Department, Ministry of Port and Shipping, Government of Pakistan's Course Training on Hazard Analysis Critical Control Point to ascertain the hands on knowledge to young scientists who aim to make their career in Fisheries Sector of Marine Sciences.

The Two-Days Course Training was conducted at Marine Fisheries Department on 2ND and 3RD of November 2016. This was the third batch of students of C.E.M.B., who participated in this annual Course Training.

The aim of this Course Training was to aware young scientists about the importance of HACCP and how it plays a vital role in quality maintenance of perishable goods that are not only consumed locally but also internationally. The focus of this HACCP Course Training was Seafood specifically. The students were skilled by visits to two seafood companies who deal in seafood exports to various countries including China, Taiwan, Hong Kong, Indonesia, Malaysia, Kuwait, Saudi Arabia and many more.

The Training was conducted under supervision of Prof. Dr. Shahnaz Rashid, Assistant Professor, Centre of Excellence in Marine Biology, by Mr. S. M. Zafar Imam, Deputy Director (Training), Marine Fisheries Department, Government of Pakistan.

ABOUT HACCP:

Hazard Analysis and Critical Control Point (HACCP) is an internationally recognized system for reducing the risk of safety hazards in food.

A HACCP System requires that potential hazards are identified and controlled at specific points in the process. This includes biological, chemical or physical hazards. Any company involved in the manufacturing, processing or handling of food products can use HACCP to minimize or eliminate food safety hazards in their product.

Implementing a HACCP System requires that both Prerequisite Programs and HACCP Plans are implemented.

Prerequisite programs are programs that are put in place in the facility to control hazards in the environment, preventing contamination of the product. Prerequisite programs ensure a hygienic environment and good manufacturing processes for personnel that reduce the risk of contamination of the food product.

HACCP Plans are prepared for each process or product, and identify possible hazards and controls in place to make sure the hazards are eliminated or controlled to ensure acceptable levels in the food product.

Awareness of food-borne illness is increasing and concern throughout the industry is driving the use of HACCP and HACCP based certification programs.

DAY 1:

TRAINING SESSION I:

The session was started with the formal introductions and setting the ground rules. The session was conducted by Mr. S. M. Zafar Imam, Deputy Director (Training), Marine Fisheries Department, Government of Pakistan. He started with the ground rules and importance of HACCP. He explained how HACCP is playing an important role in fisheries and how many seafood companies those are functional in the vicinity of MFD and Karachi Fish Harbor that are working on exporting quality seafood products to various countries around the world.

The HACCP is a system and standard set according to the commodity that has to be processed. The HACCP system follows seven principles. These are as follow:

1. **Conduct a Hazard Analysis:**

The purpose of a hazardous analysis is to develop a list of hazards which are likely to cause injury or illness if they are not controlled. Points to be considered in this analysis can include: skill level of employees; transport of food; serving elderly, sick, very young children, immune-compromised; volume cooling; thawing of potentially hazardous foods; high degree of food handling and contact; adequacy of preparation and holding equipment available; storage, and method of preparation. The next step is to determine if the factors may influence the likely occurrence and severity of the hazard being controlled. Finally, the hazards associated with each step in the flow of food should be listed along with the measures necessary to control the hazard.

2. **Determine Critical Control Points (CCP's):**

A critical control point is any step in which hazards can be prevented, eliminated or reduced to acceptable levels. CCP's are usually practices/procedures which, when not done correctly, are the leading causes of foodborne illness outbreaks. Examples of critical control points include: cooking, cooling, re-heating, holding. To determine CCP's the following are supposed to be kept in mind:

- ✓ At this step in preparation can food become contaminated and/or can contamination increase?
- ✓ Can this hazard be prevented through corrective action(s)?
- ✓ Can this hazard be prevented, eliminated or reduced by steps taken later in the preparation process?
- ✓ Can one monitor the CCP?
- ✓ How will one measure the CCP?
- ✓ Can one document the CCP?

3. **Establish Critical Limits:**

A critical limit ensures that a biological, chemical or physical hazard is controlled by a CCP. Each CCP should have at least one critical limit. Critical limits must be something that can be monitored by measurement or observation. They must be scientifically and/or regulatory based. Examples include: temperature, time, pH, water activity or available chlorine.

4. **Establish Monitoring Procedures:**

Monitoring is a plan which includes observations or measurements to assess whether the CCP is being met. It provides a record of the "flow of food" through the establishment. If monitoring indicates that the critical limits are not being met, then an action must be taken to

bring the process back into control. The monitoring system should be easy to use and meet the needs of the food establishment, as well as the regulatory authority. It is important that the job of monitoring be assigned to a specific individual and they be trained on the monitoring technique.

5. Establish Corrective Actions:

If the criterion for a CCP is not being met, some type of corrective action must be taken. They must meet the standards established in Step 3, must be based on facts for normal working conditions and be measurable. Corrective actions may range, for example, from "continue cooking until the established temperature is reached" to "throw out the product," depending on the severity of the situation.

HACCP plans should include the following: who is responsible for implementing the corrective action and what corrective action was taken. They should be established in advance as part of the HACCP plan.

6. Establish Verification Procedures:

These procedures are activities, other than monitoring, that determine the validity of the HACCP plan and that the system is operating according to the plan. An important aspect of verification is to determine if the plan is scientifically and technically sound. Also, that all the hazards have been identified and that, if the HACCP plan is properly implemented, these hazards can be effectively controlled. Verification can be accomplished by expert advice and scientific studies and observations of the flow of food, measurements and evaluations. Another means of verification is an on-site review of the established critical limits. Each CCP will have one independent authority. This verification step provides an opportunity to make modifications to the plan if necessary.

7. Establish Record-Keeping and Documentation Procedures:

Record-keeping and documentation procedures should be simple to complete and include information that illustrates that the established standards are being met. Employees need to be trained on the record-keeping procedures and why it is a critical part of their job. Examples of records include time/temperature logs, checklists, forms, flowcharts, employee training records, and SOP's.

VISIT TO SUPER STAR ENTERPRISES:

The session was followed by a survey to one of the seafood companies namely Super Star Enterprises. Super Star Enterprises is one of the freeze dried seafood products company in Karachi.

Survey included a formal introduction of the team of the company to the students. A brief introduction of the company was also given followed by the survey to the processing hall.

The Processing Hall was divided into sections where all the steps i.e. from cutting, peeling, gutting of seafood to packaging of the products were being conducted. The hall also had a section where fresh shrimps, fish and cephalopods were kept waiting to be processed. In another corner there laid an ice making room where the company made its own hygienic ice. The hall also had heavy machinery powering the freezers as well as keeping the temperature to an optimum minimum level of the hall for keeping the freshness of products to fullest.

The process in the production hall started with cleaning and cutting of the product. During the observed process, finfish was being cleaned for further process.

Next the product is sent to the grading station where the specimens are separated on the basis of their sizes. At the grading station, squids were being graded according to their sizes.
Furthermore at the other grading station, finfish were also being graded according to their sizes.
At the packaging station, the graded squids were being packed in 2 KG polythene bags. Furthermore these were being sent to the next station where these 2 KG polythene bags containing the product were being packed in cardboard boxes ready to be sent to cold storage until shipment. The cold storage was actually a giant freezer with the temperature reaching -17^{o} Celsius.

CONCLUSION OF DAY 1:

The first day concluded with a comparative study of the session delivered and how HACCP is implemented and plays an important role in seafood processing. However, the students observed that the HACCP standards are not being maintained properly at Super Star Enterprises. Following is the summary of observed protocols:

- → A: Excellent
- → B: Good
- → C: Fair
- → D: Poor

FACTORS	GRADING
Staff training	**B**
Improved staff consciousness of food safety	**C**
Attitude/motivation of production staff	**D**
Attitude/motivation of supervisory staff	**C**
Meet legal requirement	**C**
Increased product sale	**D**
Investment of new equipment	**D**

DAY 2:

TRAINING SESSION II:

Second day started off with a bit of revision of the past day and discussing the experience at Super Star Enterprises. Furthermore the schedule was discussed for the following day that included a few paper based activities followed by fish quality identification methods and a visit to Taj Fisheries for a similar inspection and observation.

Before the activities followed a session was conducted by Mr. Zafar Imam discussing and briefing the practical HACCP seven steps. These included the following:

Principle 1: *Conduct a hazard analysis*.

Plants determine the food safety hazards identify the preventive measures the plant can apply to control these hazards.

Principle 2: *Identify critical control points.*

A critical control point (CCP) is a point, step, or procedure in a food process at which control can be applied and, as a result, a food safety hazard can be prevented, eliminated, or reduced to an acceptable level. A food safety hazard is any *biological, chemical,* or *physical* property that may cause a food to be unsafe for human consumption.

Principle 3: *Establish critical limits for each critical control point*.

A *critical limit* is the maximum or minimum value to which a physical, biological, or chemical hazard must be controlled at a critical control point to prevent, eliminate, or reduce to an acceptable level.

Principle 4: *Establish critical control point monitoring requirements.*

Monitoring activities are necessary to ensure that the process is under control at each critical control point. FSIS is requiring that each monitoring procedure and its frequency be listed in the HACCP plan.

Principle 5: *Establish corrective actions.*

These are actions to be taken when monitoring indicates a deviation from an established critical limit. The final rule requires a plant's HACCP plan to identify the corrective actions to be taken if a critical limit is not met. Corrective actions are intended to ensure that no product injurious to health or otherwise adulterated as a result of the deviation enters commerce.

Principle 6: *Establish record keeping procedures.*

The HACCP regulation requires that all plants maintain certain documents, including its hazard analysis and written HACCP plan, and records documenting the monitoring of critical control points, critical limits, verification activities, and the handling of processing deviations.

Principle 7: *Establish procedures for verifying the HACCP system is working as intended.*

Validation ensures that the plans do what they were designed to do; that is, they are successful in ensuring the production of safe product. Plants will be required to validate their own HACCP plans.

Verification ensures the HACCP plan is adequate, that is, working as intended. Verification procedures may include such activities as review of HACCP plans, CCP records, critical limits and microbial sampling and analysis. HACCP plan include verification of tasks to be performed by plant personnel. Verification of tasks would also be performed by inspectors. The supervisor and associated team will undertake microbial testing as one of several verification activities that may verify the occurrence of the identified food safety hazard.

Various activities that took place after the session included the following:

- ✓ Development of a HACCP document for shrimps in which all the major threat and hazards had to be identified
- ✓ Verification of quality of fish had to be determined using the identified critical points
- ✓ Fish Identification was conducted by Mr. Hamid Badar Osmani who described the major groups of fish that are majorly exported and consumed internally by various countries.

CERTIFICATE DISTRIBUTION AND CLOSING:

Mr. Mohammad Wasim Khan, Director General, Marine Fisheries Department, Government of Pakistan, attended the closing ceremony and gave his remarks on the training. He also updated the students about two new publications of fisheries sector that have been published in collaboration with FAO and will be launched soon. The books include a field guide to fishes of the Arabian Sea and an Identification Guidebook of Marine Resources of the Arabian Sea.

Furthermore the closing remarks were also added by Mr. Zafar Imam as he really appreciated the collaboration of Centre of Excellence in Marine Biology, University of Karachi for making the training successful.

Prof. Dr. Shahnaz Rashid also thanked the bureaucrats to welcome her students at Marine Fisheries Department.

The certificates were distributed to all the students who attended the two-day course training on HACCP implementation in fish industry of Pakistan.

VISIT TO TAJ FISHERIES:

Taj Fisheries is yet another seafood company dealing in supply of freshwater as well as marine fish species to various vendors. It is functional in Karachi.

The visit started with an inspection to the Receiving Hall where all the auctioned and bought products are unloaded. Then these are sent to grading platforms where these are sorted according to their sizes. Once graded these are sent to the cleaning section where the fish is cut and gutted. If the fish is required whole by the client, then these are glazed. Glazing is a phenomenon of dipping the fish in water for maintaining the freshness and quality of fish since whole fish can face contamination easily. The percent of glazing according to international laws is 10% only. Then these products are forwarded to sorting and packaging section where these are kept in metallic trays of particular weightage. These are then blast chilled ready to be packed further. Initially the fish are packed in cardboard boxes and kept in freezer for further process. When the client requires the order to be shipped, the fish are then re-packed in bigger cartons with proper labeling that contains the company logo and other details that are required for legal procedures of shipment. The products that were observed during the survey included Pangasius Catfish.

After the visit to the processing hall, the staff took the students to the office and administration section where the students were briefed about the history and making of the factory where the seafood is processed.

Taj Fisheries was started by Haji Mohammed Taj in 1995 and is being run by his sons. They have built a new processing plant in Karachi Fish Harbor, with all new machinery. They have a large network to source new products to fulfill our customer demands and assure the highest

grade of quality with the quantity to supply. They deal in fresh water and seawater fish such ayer, boal, chital, bag ayer, ribbon fish, blue crab, king fish, bata, sing, moila, squid, grey mullet, leather jacket, Indian mackerel, eel and all types of prawns.

CONCLUSION OF DAY 2:

The second day concluded with hands on knowledge that is required by an individual dealing in frozen seafood business. The tactics included the technical knowledge that was gained during the survey. The students also observed and graded the efficiency of Taj Fisheries. The observed is given below:

- → A: Excellent
- → B: Good
- → C: Fair
- → D: Poor

FACTORS	GRADING
Staff training	**B**
Improved staff consciousness of food safety	**B**
Attitude/motivation of production staff	**C**
Attitude/motivation of supervisory staff	**B**
Meet legal requirement	**B**
Increased product sale	**A**
Investment of new equipment	**A**