HACCP-Based Philippine Fish Inspection Program

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ABSTRACT

This paper presents the current fish processing activities in the Philippines with particular emphasis on fish product quality management. It highlights some significant laboratory, technological and industrial advances that affect fish product quality management. The current activities to implement the program which includes training, technical and advisory assistance are presented. Future developments, government policies and priorities to support the program are also presented.

The implementation of Hazard Analysis Critical Control Points (HACCP) as a quality management system is currently the most important agenda among the food manufacturers. Compliance with USFDA Regulations on HACCP by 1997 and with EC Directives have become major concerns of the industry. Such quality systems have urged the government to initiate moves by which the industry can comply in order to maintain the country's position in the highly competitive seafood trade.

Fish Processing Industry Status

The agreements on the Exclusive Economic Zone (EEZ) and the United Nations Convention on the Law of the Sea (UNCLOS) highlighted the Philippines as an archipelago having the second largest expanse of territorial waters next to the United States (Gatchalian 1996).

As an archipelago, this country is a favourable habitat for abundant marine resources where fish remains an important staple food for the people. The fish consumption of 40 kg per capita per year (Giron, 1994) which represents 60% of the protein requirement of Filipinos (Shahani, 1991) is twice the per capita consumption for fresh/processed meat, poultry and other meat products combined (16.5 kg per capita per year). This data underscores the significance of fish as a staple food (Gatchalian, 1996).

The Philippines is a major supplier of fish and fishery products to key seafood trading partners namely, Japan, USA and EC among others. It has active fish/prawn farming and processing industries with products that are mostly sought for the export market. Latest records show that the Philippines is the 12th largest fish producer in the world. Its fishing industry accounts for 3.9% and 4.9 % of the country's Gross Domestic Product (GDP) at current and constant prices, respectively (BFAR, 1995).

However, with a rapidly increasing population at an estimated rate of 2.4 % per year and the continuous abuse of the seas, studies and observations made of marine life have shown possible reduction in available fish supplies by the year 2000.

1. Processing Activities

The total fish production of the Philippines in 1994 was 2.6 million tonnes (BFAR, 1995). Approximately 70% of the total catch is consumed fresh/chilled while 30% are processed, viz cured, canned, frozen fillets, dressed fish or disposed live.

Fish processing activities involve the use of fish processing and preservation methods of smoking, drying, salting, fermenting, canning, icing, chilling and freezing.

The production of certain value-added products such as fish balls, squid and cuttlefish balls, fish and squid patties and nuggets proved to be successful. Exports of some of these products have been attempted by a few exporters on a limited scale.

The bulk of products from traditional fish processing industries is absorbed by the local market, with small quantities exported as ethnic products. Canned, fresh, chilled/frozen products are usually exported. Total fish products exported in 1994 was 172,080 tonnes valued at P 15,027 million (NSO, 1995) as shown in Table 1.

Trawl by-catch, rejects from dried and smoked fish and from by-products of imported raw materials are reduced into meals and used as animal feed ingredients and fertilizers.

Chitin and chitosan processing has been attempted to convert crustacean shell wastes into high-value by-products of relatively significant economic importance. A pilot plant for chitin and chitosan processing has been established in Roxas City. The products produced are now on market trial in Germany.

The major fish processing industries by region are shown in Table 2.

Significant Laboratory, Technological and Industrial Advances that Affect Fish Product Quality Management

1. BFAR as the Regulatory Agency for Fish and Fishery Products

The Bureau of Fisheries and Aquatic Resources (BAR) is mandated under Fisheries Administrative Order (FAO) no. L17 to regulate the operation of fish processing plants , and prescribe/ require standard quality control and inspection of processed fish and aquatic products. This is pursuant to the provisions of Sections 7, 16 and 18 Of Presidential Decree (PD) 704 known as the Fisheries Decree of 1975.

For the past years, the BFAR performed its regulatory functions as stipulated in this law. The fish inspectors inspect and monitor fish processing plants during which they prescribe minimum requirements to ensure that fish products are properly processed and that they are safe for human consumption. Among the other objects of inspection and monitoring of fish processing plants, this law enables the BFAR to check the quality standards for shrimps and prawns and the grades for tuna, the processing procedures and the hygiene and sanitation aspects of seafood processing operations.

2.New Developments in Fish Quality Management

New developments in fish quality management have taken place recently. With the trading of fishery products becoming highly active in the Asia Pacific region, there is also the trend in this region and world-wide toward more stringent consumer expectations regarding food quality and safety. Consequently, governments have to tighten up regulations and implement new control systems covering fish and fishery products. Adjustments are to be made in the Philippines and new techniques are necessary as countries and processing facilities move from end-product verification as a quality control system to evaluation of the system in the country where the product is produced.

This is also in response to the need to provide safe food supplies to the peoples of the world in addition to the continuously changing consumer demands and expectations. USA and Canada imposed the Hazard Analysis Critical Control Point (HACCP) quality system. Canada had earlier developed its Quality Management Program (QMP) which is HACCP-based in concept. USA made HACCP regulation mandatory by 1997. The European Economic Communities (EEC) prescribed their requirements for fish products entering the EC market in its Council Directives.

Under the Quebec Declaration for sustainable fisheries development, we should promote international trade, efficient marketing and distribution, reduce post harvest losses and realize the potential of traditional foods. This declaration is best addressed in the HACCP-based quality system. With a HACCP-based quality management program in place, smooth international trade in fish products can be easily achieved and safer supplies could be made available to all consumers.

Similarly, the Kyoto Declaration of 1995 states that for sustainable contribution of fisheries to food security, it is our responsibility to increase fish supplies for human consumption through optimum use of fish harvested and by reducing losses and developing and improving appropriate technology and effective systems while ensuring safety of foods.

Under the Code of Responsible Fisheries, the harvesting, processing and distribution of fishery products should be carried out in a manner which will maintain nutritional value, quality and safety of the products, reduce waste and minimize negative impact on the environment. There are similar provisions for responsible international trade in fishery products which could serve as guides for both government and the industry sectors.

a. The Second National Fisheries Development and Policy Planning Workshop

The Quebec and Kyoto Declarations and the Code of Responsible Fisheries became the guiding principles for the Philippine policy makers in developing strategic plans for fish post- harvest technology in its Second National Workshop on Fisheries Development and Policy Planning held in February 1996. This strategic plan highlighted the directions for priority actions to be undertaken to improve the management of fish post-harvest technology of the industry over the next 5 years.

b. The Medium Term Fisheries Management and Development Program

At present the BFAR is implementing the Medium Term Fisheries Management and Development Program (MTFDMP) in which Post-Harvest Marketing and Infrastructure is one of the major components which included aquaculture and marine fisheries. The objective of this program is to

increase fish and aquatic resources production within ecological limits and to alleviate the living conditions of the fisher folk.

Under this component, the institutionalization of fish inspection procedures, research and extension on value-added products and on the reduction of post-harvest losses are top priorities. Presently, infrastructure improvement activities include establishment, improvement and rehabilitation of fishing ports and landing areas, ice plants and cold storages and other facilities related to post- harvest. Market matching and marketing support are also provided.

c. The Philippine Legislation as an Exporter of Fish Products to EC

This legislation known as 95/190/EEC issued by the European Commission (EC) on 17 May 1995 took effect on 01 August 1995. This legislation brought about a number of significant changes to the fish inspection and quality control program of the BFAR. Under this law, the BFAR is the government authority on fish and fishery products recognized by the EC. Thus focused a HACCP-based fish inspection and quality control program was developed for the BFAR.

3. HACCP-based Inspection, Monitoring and Verification of Fish Processing Plants

a. Designation of BFAR Fish Inspectors and Department of Agriculture (DA) Regional Office Fish Inspectors

The Post Harvest Technology Division (PHTD) of the BFAR is the core of fish inspection activities. It has seven (7) trained fish inspectors in Metro Manila who perform fish inspection and plant monitoring activities; they also co-ordinate with the DA regional fish inspectors.

The number of fish inspectors and their corresponding areas of inspection are shown in Table 3.

The regional fish inspectors inspect and monitor the fish processing plants located within their areas of inspection and submit reports of inspection to the PHTD-BFAR regularly. At present there are 58 fish processing plants accredited to export fish products to the EC. However, only 38 of them are actively exporting to EC.

With the approval of the Philippine legislation as an exporter of fish products to the EC, it became compulsory for the government to implement a HACCP-based inspection scheme to monitor and verify fish processing establishments, especially the EC-accredited plants. This scheme of inspection is described below.

b. Inspection of EC-accredited Fish Plants

The EC-accredited fish processing plants have been graded as grades A, B and C. The descriptions for each grade are as follows :

Grade A - fish plants which fully comply with EC requirements and are given unlimited approval to export to the EC. These plants are inspected once or twice a year.

Grade B - fish plants with a minimum of 5 minor to major deficiencies, but without critical or serious deficiencies. These plants are recommended for accreditation and are monitored by the regional fish inspectors every month.

Grade C - fish plants with 6 to 10 major and critical deficiencies. These plants are not recommended for accreditation if they cannot rectify their critical deficiencies.

Fish inspection is carried out by the fish inspectors using a set of prepared questionnaire. The fish inspectors study the records of the plant from the time raw materials are received until it becomes a final product. This includes, among others, the reports of the production manager as to the incoming raw materials and ingredients, processing methods performed on the product, records of plant, personnel hygiene and sanitation program. They also inspect the plant and equipment layout, and their maintenance during the operation. Some plants embody all these information in their plants' quality management program or the HACCP program.

After the review of plant records, the inspectors check and verify whether those information in the plant's quality management program are implemented in the production line.

All observations made are noted in the inspection report and are discussed with the plant manager at the end of the inspection. A copy of this report is given to the plant while another copy is kept with the DA/BFAR for filing and reference purposes. These inspection reports serve as guides for BFAR and DA signatories who subsequently issue the health certificates for the fish exportered.

c. Inspection of Fish Plants for Accreditation to EC

After the accreditation of the Philippines as an exporter of fish products to the EC, more and more fish plants have sought the help of the BFAR with the intention to join the scheme. The following are the requirements for accreditation of fish processing plants.

i. A License to Operate (LTO) Number

This is to be secured from the Bureau of Food and Drugs (BFAD), the government agency mandated to conduct inspection of all food processing plants to ensure that they are observing the Good Manufacturing Practices (GMP) and proper hygiene and sanitation. The LTO number issued by the BFAD eventually becomes the EC approval number of the plant which is required of an exporter to the EC.

ii. Plant Inspection by the BFAR/DA Fish Inspectors

As soon as the plant has secured its LTO, it can request the BFAR/DA to inspect their plant. If the plant fully complies with the EC requirements and has a quality management program in place, then it is recommended for unlimited approval to export products to EC.

If the plant is graded B, then it is recommended for an initial one year's accreditation. If they can fully comply with the EC requirements and a quality management program is in place, then they can be subsequently upgraded to unlimited approval. Grade C plants which are not complying with the EC requirements are advised accordingly and are recommended for accreditation only after all requirements are satisfactorily complied with.

iii.Compliance with EC Requirements

Each plant is given a copy of the Council Directives 91/493/EC and 95/190/EC for their compliance. These Directives are discussed by the fish inspectors with the plant manager during the initial inspection. Compliance with these requirements should be done not only when there is an inspection team visiting to the plant, but it should become the plant's quality management program guide in order that it can be recommended for accreditation.

d. Issuance of Product Health Certificate

The BFAR Director is the authorized signatory to the health certificate for fish products for export to EC. However, this function is delegated to its Post-Harvest Technology Division. In addition, due to the strategic locations of the accredited plants, the issuance of the health certificates in the regions was delegated to the DA Regional Directors for Fisheries.

d. Verification of Fish Product Quality

Verification of fish product quality is performed by government and accredited private laboratories. Representative samples of fish products for export are examined using chemical, sensory and microbiological methods. The results are used as reference as to the fitness of the products for human consumption. Records of fish product analysed are filed with the DA and BFAR as the signatories to the health certificates while the plants keep their own files for verification and reference purposes.

Current Activities to Implement the HACCP-Based Quality Management Program

1. Training and Seminars

a. Training on EC Directives

The BFAR conducted a training course on the implementation of EC Directives and the mechanics of plant inspection for the regional fish inspectors and signatories to the health certificate based on the requirements of the EC. This enabled the participants to understand the basic principles and application of HACCP which are the essence of the EC Directives. They were also taught the requirements for accreditation of fish processing plants and the provisions of the EC Council Directives 91/493/EC and 95/190/EC on the export of fish products to EC.

b. Training on HACCP for Fish Inspectors

The First National Training on HACCP was conducted for regional fish inspectors. This training includes exercises on the application of the seven principles of HACCP and provided the participants with practical hands-on experience on the development of a HACCP program for each given fishery product.

c. Training on HACCP for Fish Processors

Shortly after the training on HACCP for fish inspectors, the fish processors requested the BFAR to conduct a similar training course for them. It was in Mindanao where most of the tuna canning plants are located that this training was conducted. The participants were 25 QC-managers and supervisors, representing the seafood industry from this area. Other processing industries such as fresh/frozen fish, smoked fish and value-added fish product industries

were also represented. The participants were taught how to develop their own HACCP plans.

d. APEC Seminar on Evaluation of HACCP and Quality Systems

The BFAR hosted the above seminar which was designed for seafood industry representatives from APEC member economies. This was conducted by quality systems specialists from US Food and Drug Administration (USFDA), Australian Quarantine Inspection Service (AQIS), the Canadian Department of Fisheries and Oceans (DFO) and the US National Marine Fisheries Service (NMFS). Taiwan and Singapore representatives were in attendance and the rest of the participants came from the Philippine seafood industries. This seminar was sponsored by USA and Canada.

This seminar was able to improve the working relationship between the plant QC managers and the BFAR fish inspectors during plant assessment activities. Both parties now understand how to deal with each other better during plant assessment activities.

e. HACCP Curriculum Steering Committee Meeting

The BFAR participated in an overview workshop of the HRD Process for HACCP curriculum development intended for skills training in each occupational level: managers, supervisors and line workers.

The ASEAN-Canada Post Harvest Technology Project-Phase II will be submitting a project intended solely to train plant personnel on HACCP to be funded by Canadian International Development Agency from 1997 to 1999 for the ASEAN region. The steering committee will formulate the training curriculum for 4 occupational levels.

This project will enable each processing plant to develop their own HACCP plans to best effect. Since more plant personnel will be trained on HACCP, they will become more quality-conscious and be able to upgrade their skills and competence in implementing their quality assurance programs.

2. Technical and Advisory Assistance

The BFAR and other government agencies performing regulatory functions related to fish product quality management work hand-in-hand to provide technical and advisory services to the industry.

The government and private laboratories accredited to conduct analysis of fish products provide similar support to the industry. The major technical and advisory services rendered to the seafood industry on quality management are as follows :

a. laboratory analysis of products (chemical, microbiological and sensory evaluation),
b. issuance of product quality certificate for export to both EC and non-EC countries,
c. development and quality improvement of products,
d. inspection of imported fish products,
e. inspection of fishing ports and landing areas,
f. inspection, monitoring and verification of fish processing plants, and
g. information dissemination through training, seminar and workshops.

3. Implementation of the Consumer Act of the Philippines

Republic Act No. 7394 is known as the Consumer Act of the Philippines which took effect on 15 July 1992.

Under this Act, the State protects the interests of the consumer, promotes his general welfare and establishes standards of conduct for business and industry.

The implementation of this act is delegated to the Department of Health (DOH) for food and drugs; the Department of Agriculture (DA) for agricultural products; and the Department of Trade and Industry (DTI) for other industrial products and services not covered by the DOH and the DA.

As implementors of this Act, these agencies are mandated to establish quality and safety standards of consumer products, tests and codes of practice to check the quality and safety of the products; assist consumers in evaluating product quality; protect the public against health risks; undertake research to improve product quality and assure the public of consistently standardized products and services.

They are also mandated to inspect processing plants before the issuance of a License to Operate (LTO), monitor operations, issue certificates of product quality and to recall any product in the market deemed not conforming to established standards and unfit for human consumption.

The sale and distribution of unprocessed fish for public consumption is regulated by the provincial, municipal, and city government pursuant to the provisions of the Local Government Code.

With the implementation of the Consumer Act of the Philippines, issues and problems pertaining to fish products for local consumption are now properly addressed. This also gives the local

consumers the assurance that they can fully exercise their rights as consumers.

Issues and Problems

1. The need to strengthen the country's competitive position in the world market for fish and fishery products.
   Fisheries exports have made great strides in recent years and contributed significantly to the country's foreign currency earnings. However, the following developments have undermined the country's competitive position in the world market.
   - The Philippines has lost its position as the largest exporter of canned tuna, in spite of the country's advantage of being first in the export market, of having skilled labor, and being strategically located in the richest tuna area in the world.
   - The mid-1989 drop in the world price of shrimp caused a tremendous crisis in the local shrimp industry and the whole aquaculture industry. The industry found it almost impossible to compete with other suppliers in the world due to high input prices and limited markets.
   - The EC Council Directives on health requirements are very stringent and difficult to comply with by a third world country like the Philippines. In fact, with only 58 plants accredited to export to EC , it indicates that the volume of exports is limited.
   - The USFDA mandatory regulations on HACCP which will take effect on 18 December 1997 is another drawback to small-scale seafood entrepreneurs.
2. The need to strengthen government institutional support.
   The existing set up of government support to the fisheries industry is characterized by fragmented responsibilities and conflicting priorities among many agencies.
3. The need to speed up the rehabilitation and upgrading of the maintenance of infrastructure facilities such as fishing ports and complexes, landing areas, fish markets and ice plants and cold storages in major fish landing areas.
4. The need to institute an effective and extensive technology transfer program. An effective and extensive technology transfer mechanism is needed to address the industry's problem of poor handling practices, hygiene and sanitation, product quality and product development.

Future Plans

1. Strengthening the Fish Inspection and Quality Control Programme

The strategy for attaining the plans to strengthen the Fish Inspection and Quality Control Program can be achieved through :

a. Expansion of post harvest services to improve fish handling and distribution through additional infrastructure facilities such as fishing ports and fish processing complexes in strategic places.
b. Establishment of quality control standards for fish and fishery products to ensure product acceptability.
c. Formulation of Fisheries Administrative Orders (FAO) to regulate practices from the time of catch/harvest to landing areas and markets.
d. To review FAO 147 (Rules and Regulations Governing the Issuance of Permits/Commodity Clearance for the Exportation of Fish and Fishery/Aquatic Products) and E.O. No. 1016 (Withdrawing the Inspection, Commodity and Export Clearance Requirements on Philippine Export).
e. To provide additional equipment/apparatus for the Quality Control Laboratory in order to make the services more responsive to the needs of the industry. There is also a need to establish fish inspection and quality control laboratories in the regions.
f. The need for field training in fish inspection system, fish quality control and assurance program intended for fish inspectors, plant managers, supervisors and processors.
g. To implement a massive extension service program on good fish handling practices, quality consciousness and good manufacturing practices in the fish processing industry for effective and immediate transfer of technology at the regional level.
h. The need to increase the number of trained fish inspectors.

Despite the enormous problems that beset the fishery industry, both the government and the private sector are working hand-in-hand to create important steps for Philippine products to be fully accepted in foreign markets. The industry had shown considerable improvement and development over the past years as shown by the share of foreign exchange earnings. Full co-operation of these two sectors is needed to make the fishing industry survive and realize the benefits that can be derived from it.

The government will continue to provide support for traditional fisheries exports like tuna, shrimp/prawns and seaweeds as well as for non-traditional commodities like cephalopods, live fish and invertebrates. To expand exports of these products, BFAR will continue to enforce regulatory powers to strengthen the fish inspection and quality control programs.

2. The Fisheries Code is a proposed legislation which will institutionalize the fisheries management principles

This legislation is now pending in the Philippine Congress and has been certified as an urgent bill by our Honourable President. This Bill, when passed will provide further means whereby the Philippines can depend on its fisheries industry to contribute towards the country's food security.

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Table 1. Major Fishery Exports in Terms of Value (1994).

Commodity/Kind	Quantity (tonnes)	FOB Value (000P)	% Share (Value P)
1) Shrimps and Prawns	22,418	6,411,535	42.67
Frozen/Chilled	21,676	6,271,377	
Shrimp & Prawn other than Frozen	742	140,131	
Prepared/Preserved	-	27	
2) Tuna	78,365	4,397,932	29.27
Frozen/Chilled	20,332	709,079	
Prepared or preserved in airtight container	58,033	3,607,853	
3) Seaweeds	24,826	581,945	3.87
Seaweeds & other Algae	23,557	572,171	
Seaweeds & Algae, used for food	56	3,099	
Kelp Powder	1,213	6,675	
4) Cuttlefish/Squid	3,191	548,261	3.65
Fresh/Chilled	33	3,832	
Frozen, dried, salted in brine	3,123	539,897	
Prepared/preserved whether or not in air tight container	35	4,532	
5) Octopus	7,633	511,233	3.40
Frozen, dried, salted in brine	7,633	511,233	
6) Crabs/crab/fats	1,938	244,702	1.63
Frozen/other than frozen	1,652	160,797	
Prepared/preserved (includes crab fats)	286	83,905	
7) Ornamental Fish	6,211	213,328	1.42
8) Worked capiz shells and articles (including art, obtained by molding)	900	187,361	1.25
9) Lobster	912	157,402	1.05
Frozen	910	156,402	
Prepared/Preserved	2	857	
10) Live *Lapu-Lapu*	5,329	118,068	0.79
Total Major Commodities	151,723	13,371,767	88.98
Total of Other Commodities	20,357	1,655,567	11.02
GRAND TOTAL	172,080	15,027,334	100.00

1 US$ = P 26.02

Table 2. Major Fish Processing Industries by Region

Regions	Location	Major Processing Industries	Fish Used
I	Ilocos	fermenting/salting drying	fish & shrimp
II	Cagayan Valley	drying freezing smoking	*Acetes* sp. cephalopods roundscads, sardines, mackerel
III	Central Luzon	drying fermenting/salting smoking	fish/shrimp slipmouth roundscad
IV	Southern Tagalog	drying smoking canning freezing	sardines fish/shrimp tuna sardines
NCR	Metro Manila	canning drying smoking salting freezing chilling value-added products	milkfish, mackerel, tuna, sardines pelagics pelagics tuna, cephalopods grouper shrimps/prawns shrimps/cephalopods
Region V	Bicol Region	value-added products smoking drying salting canning	shrimps/cephalopods, sardines roundscads anchovies croaker, lizard fish, squid mackerel, sardines roundscad, *Acetes* sp., octopus, abalone, akigae/clams
VI	Western Visayas	drying chitin-chitosan salting freezing canning	pelagic fish, shrimp, squid, mussel, cephalopods, crabs, jelly fish shrimps heads (shell waste) *Acetes* sp., anchovies shrimp/prawns tuna, bangus, squid, abalone, tuna, crab meat
VII	Central Visayas	drying salting freezing	squid, fish, mackerel, croaker, shrimp, *Acetes* sp. anchovies, roundscad, bangus, shrimp, scallop, jelly fish
VIII	Eastern Visayas	curing drying freezing salting canning	abalone shrimp, pelagic fish shrimp, octopus, cuttlefish squid pelagic fish, fresh water fishes
X	Northern Mindanao	drying freezing fermentation	pelagics shrimps/prawns, cephalopods anchovies, pelagics
XI	Southern Mindanao	drying, fermentation,canning, icing, smoking	cephalopods, shrimp pelagic fishes, stone fishes, shell products, sea cucumber

XII	Central Mindanao	drying fermentation canning smoking	tuna fish & tuna like, cephalopods, nylon shell, abalone, pelagic fishes, aquaculture fishes, sea cucumber, tuna & like fishes
XIII	Caraga Region	drying smoking freezing fermentation	pelagic, fresh water fishes, shrimp, aquaculture product, fresh/seawater fishes, cephalopods, croaker, crabs, pelagic fishes

Table 3. Number of Fish Inspectors and their Corresponding Areas of Inspection.

BFAR / DA Regional Office	Areas of Inspection	No. of Fish Inspectors	No. of Plants
BFAR	Metro Manila area	7	28
Region 6	Iloilo City and vicinities	3	7
Region 7	Cebu City and vicinities	3	5
Region 8	Tacloban City and vicinities	3	2
Region 9	Zamboanga City and vicinities	2	7
Region 10	Cagayan de Oro and vicinities	2	2
Region 11	Davao City and vicinities	2	6
Region 13	Caraga Region	1	1
Total		23	58