

Development and Implementation of a National HACCP Training Program: The Experience of Vietnam

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Abstract

The first HACCP training course in Vietnam organized by FAO and INFOFISH took place in Ho Chi Minh City in May 1991 with the participation of the managers from both industry and government. Following the principle of "training other trainers", other training courses (where all leading lecturers were Vietnamese) were organized all over the country. Under the Government Project KN 04-15 "Upgrading the Quality of Frozen Fish Products" five fish processing plants from all important fishing areas were selected for the Trial HACCP Implementation Program. The trial gave us reasons to conclude that instead of immediate implementation of HACCP or ISO 9000 programs, the best way is to choose GMPs as the first step to lead into the implementation of HACCP in Vietnam. This paper lists the main reasons, presents the working steps and the experiences gained from various plants' GMP implementation. Attention is paid to the role that NAFIQACEN (National Fishery Inspection & Quality Assurance Center) played in the implementation of the HACCP-Based Quality Management Program in Vietnam. The present obstacles are pointed out and activities planned to achieve the strategic objectives of the fisheries sector in the coming period are described.

Introduction

During the last 15 years (1980-1995) the development of the fisheries sector of Vietnam has achieved significant results. The annual fisheries production from catching and aquaculture has increased from approx. 600,000 tonnes in 1980 to around 1.344 million tonnes in 1995, while exports for the corresponding years - from approx. 19 million to 550 million USD - increased by about 29 times. In comparison with the other economic sectors in Vietnam the fisheries sector is among those with highest development rate, its export turnover is only exceeded by those of oil and rice. In the global fisheries economy the annual fisheries production of Vietnam is ranked number 19, the fisheries export value as number 30 and the

aquaculture shrimp production as number 5. Today, Vietnamese fishery products are exported to more than 25 countries and some of these products have gained considerable prestige in several major seafood markets.

Before 1975 fish processing in Vietnam was mainly carried out by a number of household industries turning out traditional salted and dried products. In the period 1975-1980 more than 40 industrial fish processing plants, with a total daily freezing capacity of around 70 tonnes for the production of seafood were established. Today, the total number of fish processing plants in the country exceeds 180 and the total freezing capacity installed in these plants corresponds to a daily output of more than 800 tonnes of frozen finished products; about 150,000 tonnes of frozen products are produced a year. The total cold storage capacity in these plants exceeds 23,000 tonnes, and their ice-making facilities provide for a daily production output of around 3,300 tonnes. For the delivery of finished products to shipping ports and domestic markets adequate means of transportation in the form of 1,000 refrigerated trucks with a total capacity of 4,000 tonnes are used.

One of the overall development objectives for the fisheries sector is to reach an annual fisheries production of 1.6 million tonnes in the year 2000 with a corresponding export value of 1.1 billion USD. To achieve this goal the following development scenario is envisaged by the Government

- Improve offshore fishing and increase its production,
- Increase aquaculture production, and
- Improve the present quality of products by suitable measures at each step along the fish production chain, from catching/harvesting through landing, receiving and transportation to processing, storage and dispatch of finished products.

The last point is one of the most important measures to reduce post-harvest losses and to preserve the natural nutritional value of fish. Our target is to increase the percentage of first grade raw-materials from today's approx. 15% of the total production to around 50% in the year 2000.

In order to realize the above-mentioned aims our attention is concentrated on the maintenance of high hygienic and sanitary conditions, the optimization of temperature-time history, the minimization of mechanical damage risk all along the fish production chain, from raw materials to semi-processed and finished products. The strategy adopted by the Ministry of Fisheries is to apply GMP practices as the first step in implementing HACCP all along the fish production chain, from catching/harvesting to processing, transportation and marketing of fish products.

Development of the National HACCP Training Program - Preparation, Familiarization and Training Courses on HACCP

In order to protect their consumers, all leading fisheries products importing countries require a quality assurance program for the imported products, in particular :

- Japan (the most important fish products importer of Vietnam) with a program to inspect and license the export companies on the basis of voluntary quality registration;
- European Union with Directives 91/493/EEC and 91/492/EEC laying down the health conditions for the production and the placing on the EU market of fishery products from other countries;
- United States (the world's second fishery products importing market) with the voluntary control program organized by FDA/NOAA to approve the import of products into the US the market;
- Canada with the Quality Management Program.

What is the way for a poor developing country like Vietnam to follow to meet the strict requirements of the international markets? We can see the resolution of the problem in the Hazard Analysis & Critical Control Points concept.

The Vietnamese fish quality management experts were first acquainted with the concept from the HACCP International Training Workshop organized in Cochin (India) in October 1990. Following that, 65 quality managers from the fisheries industry got their initial knowledge on the first HACCP training course in Vietnam organized by FAO and INFOFISH in Ho Chi Minh City on May, 1991 led by Dr. Carlos Alberto Lima Dos Santos, Senior Expert of UNDP/FAO Training Program in Fish Quality Assurance. Many Vietnamese fisheries managers and quality control experts also participated in international training courses and workshops on HACCP held in Thailand in 1991, Malaysia in 1992, Indonesia in 1992, and Denmark in 1995.

In order to apply the HACCP concept to the fisheries sector, the Ministry of Fisheries developed a national HACCP training program. To start off the program, the Ministry of Fisheries, in cooperation with the Quality Control Center of Seaprodex (the largest fishery company in Vietnam) organized HACCP training courses in the most important fishery centers of Vietnam, viz Ho Chi Minh City and Minh Hai Province in the South, Danang in the Central and Haiphong in the North. All lecturers of the training courses were Vietnamese experts, who had attended international or local training courses and workshops. The 230 participants of the training courses were members of factory directorates and their quality managers, and government quality management experts. Moreover, the other training courses on "Seafood Inspection and Laboratory Techniques" and "The Instruction to Establish GMPs in Fish Processing Factories" organized on April and December, 1995 by UNIDO/DANIDA Project US/VIE/93/058 in cooperation with the NAFIQACEN had improved the HACCP understanding in Vietnam. The most important result from the National HACCP Training Program is the positive change in thinking manner of many fish processing factory quality managers, and more importantly, the minds of many company and factory directors, who are responsible for all activities of the establishments.

Implementation of the HACCP-Based Quality Management Program - The Trial HACCP Implementation Program

In parallel with the HACCP training activities, the Ministry of Fisheries carried out a comprehensive investigation on the production technology for frozen fish products (period 1991-1992), the industrial capacity for value-added products (1992-1993) and the inspection for production conditions at 92 factories registered to export fish products to the EU (1993-1994).

The Ministry of Fisheries used the results from the investigations to classify all fish processing factories according to their investment input, export value, types of products and quality management status. Furthermore, 5 representative factories from the North, Central and South of the country were chosen for the trial program for HACCP implementation under the Government Project KN 04-15 "Upgrading the Quality of Frozen Fish Products". The selected factories were :

- Frozen seafood factory No 49, Quang Ninh Province (North)

- Frozen seafood factory No 10, Danang City (Central)
- Frozen seafood factory No 1, Ho Chi Minh City (South)
- Frozen seafood factory No 3, Ho Chi Minh City (South)
- Frozen seafood factory No 29, Minh Hai province (South)

The methodology used for the trial HACCP implementation program was as follows:

1. Factory's registration was made on a voluntary basis.
2. Evaluation of present conditions of the factories followed a system of checklists, score scale and grading based on NOAA/FDA documents.
3. Documents prepared:
 - Regulation on Health Conditions for the Production of Fishery Products (based on Directives 91/493/EEC and 91/492/EEC and the regulations on Good Manufacturing Practices of Canada and FDA).
 - Setting up of Good Manufacturing Practices (GMP) in shrimp, fish, cuttlefish or squid processing plants (based on Codex criteria).
 - Formulate guidelines for expanding the Quality Management program according to the HACCP method (based on NOAA/FDA documents).
4. In-house HACCP training for QC staff and workers.

The training has to be in accordance with suitable programs for each relevant subject. It is conducted for directors, managers, workers and quality control staff who have direct responsibility for its implementation.

5. Setting up a HACCP based Quality Management Program.

The program has to concentrate on raw materials, production conditions, final products and staff and consisted of 7 steps as follows :

- Identify potential hazards associated with all stages in the production line. Analyze the risks related to those hazards.
- Determine the Critical Control Points in the production line.
- Establish critical limits for every CCP which must be met.
- Set up monitoring procedures for each CCP (using scheduled testing and/or observations).
- Establish a plan and implement it to ensure that corrective action is taken whenever procedures indicate that a particular CCP is not under control.
- Set up verification and review procedures including supplementary tests to ensure that the monitoring system is working effectively.

- Establish an effective record-keeping system to document how every aspect of the system is working and to ensure that every failure in the system is traceable.

6. Submission of the HACCP-Based Quality Management Program to the Ministry of Fisheries for approval.

7. Implementation of the approved program.

Table 1 is a summary of the trial HACCP implementation program in the 5 factories.

Evaluation

In spite of some positive results of the trial HACCP program, we came to the conclusion that immediate implementation of HACCP or ISO 9000 programs at Vietnamese fish processing factories will face some restrictions and difficulties because:

- We still don't have enough suitable government standards, legislation and facilities to satisfy all the conditions and activities influencing the quality of raw materials, especially offshore fishing and inland distribution. As a consequence, raw material quality is a very big problem for our factories to resolve before embarking on the HACCP or ISO 9000 programs.
- The mechanical sophistication is rather low at most Vietnamese fish processing factories. The fact that one factory produces many kinds of products in small quantities had sometimes created overlaps in the production lines. This creates remarkable difficulties for the reports documentation, records updating and storage as required by HACCP and ISO 9000 schemes. Although the overlapping is undesirable, it takes time to get rid of the present situation at our factories.
- The ISO 9000 programs, as illustrated in Fig. 1, are too complicated (in "paper work" terms) and require very high investment not only for the "hard-ware part" (upgrading facilities, cost for inviting advisers and assessors etc.) but also for the "soft-ware part" (effective training for staff, setting up a suitable quality management system etc.)

And that is why we have chosen GMPs as the first step for the implementation of HACCP in specific conditions in Vietnam.

Using the experience received from the trial HACCP implementation program, and in accordance with the requirements of EU, the NAFIQACEN and its 5 branches located all over the country organized the GMP implementation at

all factories which have registered to export their fish products into EU markets. This exercise was carried out at the beginning of 1996.

The implementation of the GMP program at a factory was organized through the following steps :

1. Investigation of present production conditions (technology, products list, hygiene conditions, quality of products etc.) to establish GMP objectives.
2. Setting up GMP documentation for the factory, including :

- Final products standards.

It may be Vietnamese standards, Seaprodex standards or standards based on the requirement of customers (but they should be equivalent to Vietnamese standards).

- Raw material standards.

To be set up according to the final products standards.

- Hazard Analysis Tables (for every step in production line of each product) as a basis to set up related GMPs. Each table has five points :

Production operations: List all steps in the production flow chart at the factory for every product; for example, PUD shrimp production flow : Raw Material - RM Receiving - RM Storage - Preparation - Sizing and Grading - Washing - Weighing - Moulding - Interim Storage - Freezing - Glazing - Packaging - Storage.

Hazards: Analyze every step to identify which hazard could reduce quality of product (for example, in RM Receiving step, there could be : bad quality of raw material, bacteriological and physical contamination, abundant growth of bacteria, and weight shortage, wrong size, wrong grade...) to identify the CCP location.

Preventive actions: Identify the cause of the hazards (for example high storage temperature can cause abundant growth of bacteria) to set up suitable preventive actions.

Documentation: Fill out the control forms at suitable frequency to be sure that all CCPs are under control.

General requirements: List general hygiene requirements and corrective actions which should be taken when a CCP is out of control.

- Listing of GMPs.

- personnel hygiene;
- cleaning and sterilization of utensils and working areas;

- use and storage of chemicals (mainly chlorine, additives) and packaging materials;
- use of water; water treatment, storage and use of ice;
- storage and transportation of final products;
- use of measuring equipment (balances, thermometers, etc.);
- receiving and storage of raw materials;
- freezing, icing, packaging; and
- any other specific GMPs.

- Monitoring and records keeping system.

3. GMP verification, approval and announcement by factory director.

4. GMP implementation.

- GMP dissemination and learning (in QC staff and workers). Set up reward and punishment measures.

- After GMP is implemented, carry out daily supervision and monitoring using record forms.

- Records keeping.

5. Verification and approval of factory GMP implementation program by authorized agency (NAFIQACEN).

- NAFIQACEN periodically inspects factory or make random unannounced visits to the factory to check on their GMP implementation (following approved program).

- NAFIQACEN/factory discussions to set up corrective actions (if necessary).

6. Further implementation. Putting up documents for government approval.

General assessment

NAFIQACEN has issued authorization to 59 Vietnamese fish processing plants for export of their products to the EU. The names of these 59 factories have been submitted to the EU by the Ministry of Fisheries as a step towards the achievement of a general agreement between Vietnam and EU for the export of Vietnamese fish products to the EU.

In the individual agreements signed between the factories and NAFIQACEN as a part of the authorization procedures, it is stated that the factories will have to implement proper documentation as a part of their required upgrading activities.

Due to the above mentioned urgent requirements by major fish importers by the end of 1995, 75% of the fish processing factories have registered with the HACCP-based GMP program. The factories understand that instead of checking

only the finish products they must shift to a preventive strategy. They also understand that in order to eliminate all non-safe and non-hygiene products, to improve the quality (and the price) of their own products, there isn't any other way.

The Trial HACCP Implementation Program gave us some of the following experiences:

First, it is obvious now that the most important thing we should change first is the mind-set of every factory director, who is responsible for all the problems concerning quality management.

Secondly, the defects in the "hard-ware part" of the factory during HACCP implementation on many occasions could be overcome by suitable actions from the "soft-ware part". It means that by re-orientating the thinking of concerned people, and by using some suitable preventive action without very big changes to the building structure, a factory could sometimes improve the quality of their products.

Third, in addition to knowing HACCP and GMP concepts only in theory, by the GMP implementation program the quality management staff (not only of NAFIQACEN but also of fish processing factories) have gained invaluable initial practical experiences essential for the development of HACCP-based quality management programs suited for specific production conditions in Vietnam.

The initial achievements in economic benefits and improved product prestige reached by the factories which have implemented the program was recognized by the Ministry of Fisheries. Having acknowledged the achievements, the Ministry of Fisheries has decided to implement HACCP-based quality management programs to all activities in the fish production chain from fishing/catching, aquaculture farming, handling to processing and marketing. This is also an important point in the development strategy of the fisheries sector for the years between 2000 and 2010.

Present obstacles

The infrastructure of the Vietnamese fish processing industry, especially raw material storage at catching and landing sites, as well as transportation conditions are at a low level and may not entirely meet the safety and hygiene requirements. To satisfy HACCP concepts all factories need to invest on a scale that their present accumulated profits cannot meet.

The number of factories whose quality management systems need to be upgraded in terms of HACCP concept is rather big, while the human

resources for aiding them in HACCP implementation program is not sufficient and not experienced enough at the present.

The Vietnamese legislative papers concerning HACCP-based quality management programs in fish processing factories have not been drafted or promulgated yet. The necessary guidelines and inspection forms for the program are still under elaboration.

Implementation plan for the coming period

To achieve the objectives of the fisheries sector for the year 2000, the fisheries authorities should carry out the following activities :

- Elaborate and submit to the Government and the Ministry of Fisheries the Inspection Regulation on production conditions in fish processing factories, the Decision on application of HACCP and GMP in fish processing and trading establishments and other legislative papers on approval procedures for HACCP implementation and work towards their eventual promulgation.
- Establish policies concerning finance, technology and personnel to support factories which have implemented HACCP-based quality management programs.
- Reinforce information dissemination activities, prepare/publish suitable teaching documents and organize training courses to prepare the establishment's directorate members, factory quality management staff and workers for HACCP and GMP implementation.
- Classify all fish processing and trading establishments according to their production competence level, technological compliance level and staff capability as a basis to identifying establishments which follow HACCP-based GMP programs and which ones could start their HACCP plan.
- Set up action plans to reach the year 2000 when all fish processing factories will implement HACCP plan, and all fishing vessels, fishing ports, etc apply the HACCP-based GMP program.
- Perfect the infrastructure, organization work and activities of NAFIQACEN headquarters and its branches as the main instrument to implement the HACCP-based quality management program in Vietnam.

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Discussion

Mr Hung emphasized that one way of overcoming the obstacles in the development of quality assurance program is through cooperation among countries and agencies in the region. There should be a continuous training of staff from ASEAN on HACCP and GMP programs.

The Seminar suggested that SEAFDEC could conduct the training programs and continue the activities from where the ASEAN-Canada Fisheries Post-Harvest Technology Project - Phase II has ended. Such training programs could be conducted directly at the industry level.

Table 1. The results of the Trial HACCP Implementation Program in 5 factories.

	Implementation activities	Factory 1	Factory 3	Factory 10	Factory 29	Factory 49
1	Voluntary registration to participate in the program	+	+	+	+	+
2	Preliminary investigation of production conditions	+	+	+	+	+
3	Estimated capability of HACCP program implementation	Medium	Medium	Medium	Good enough	Good enough
4	Registered products	IQF squid fillet	IQF squid fillet	Cuttlefish, squid, <i>sashimi</i> and frozen fish fillet	Block-frozen shrimp	Cooked shrimps
5	Personnel involved (HACCP team)	6	4	7	7	7
6	Investment for premise upgrading	Small repairs	Total upgrading	Partial repair	Partial repair	Partial repair
7	Evaluation of Trial HACCP Implementation Program established by factory: - Documents submitted - Definition of Production Flow Diagram - Determination of Critical Control Points - Record papers for Critical Control Points - Preventive actions - Corrective actions - Do they have necessary measures to overcome?	Good Good Too many Many Not enough Satisfied Yes	Good Good Medium Medium Satisfied Some are not reasonable Yes	Good Good Too many No Satisfied Satisfied No	Good Good Medium Medium Satisfied Satisfied Yes	Good Good Medium Medium Satisfied Satisfied No
8	Efficiency - Quality aspect - Economic aspect	Good New purchase orders for value-added commodities exceed factory's capability	Good Reduced the percentage of block frozen shrimp to 15%. Start the production of value-added products	Good Became one of the first factories in the Central region which processed products that excluded microorganism contamination in <i>sashimi</i>	Good First-class shrimp products increased by 10%; the highest product price in comparison with the other factories in the South.	Good Joint venture with Japan to process value-added products.
9	Social aspect - Worker's income	Improved	Improved	Improved	Improved	Improved

Legend: + completed

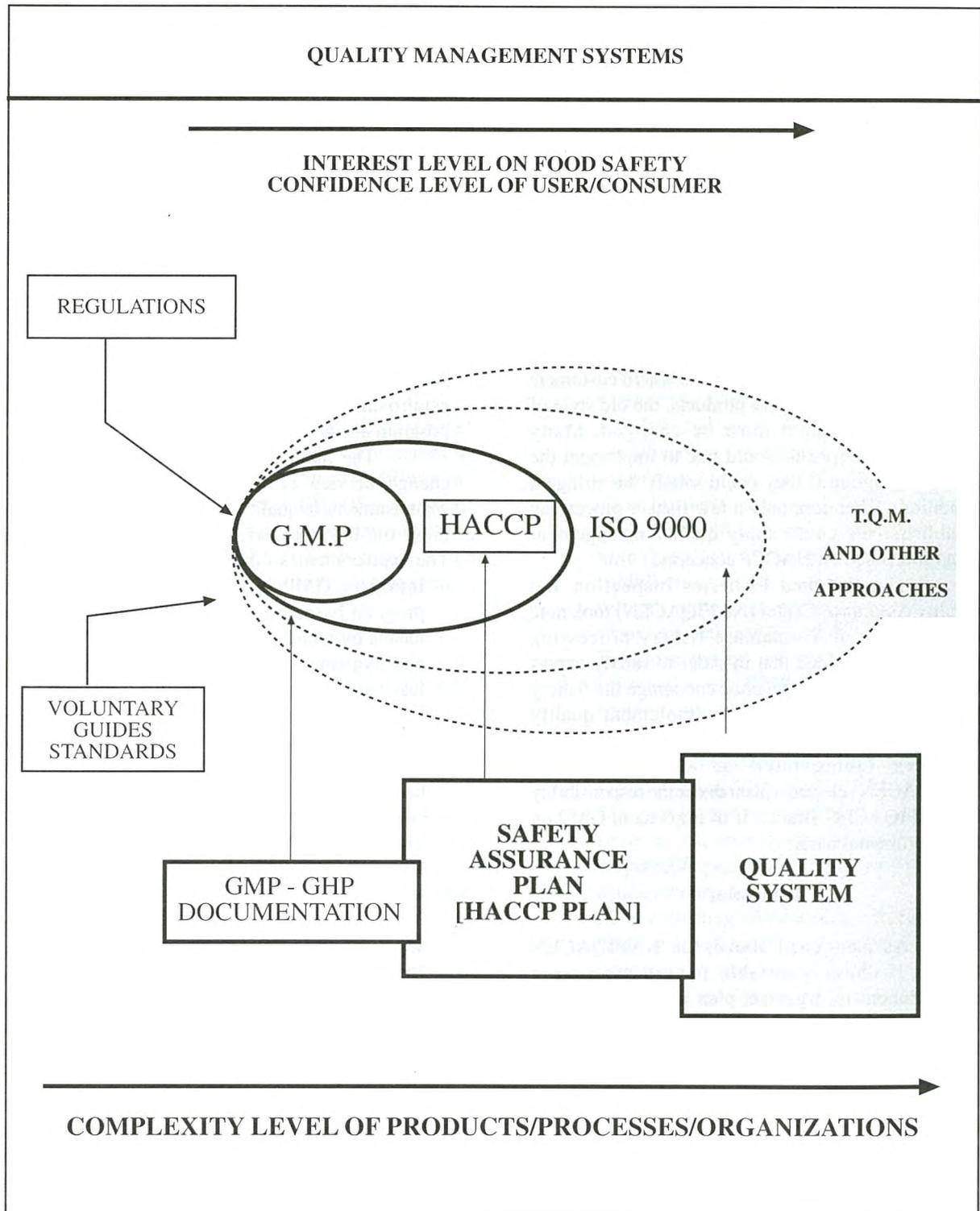


Fig. 1. Diagram of overlap of quality management system.