

**QUALITY CONTROL IN PROCESSING AND DISTRIBUTION
OF FROZEN BASA CATFISH (*PANGASIUS HYPOPHTHALMUS*)
FILLETS IN VIETNAM COMPARED TO A SIMILAR PROCESS
IN ICELAND**

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ABSTRACT

In recent years, the Vietnamese fishery sector has been developing rapidly and has now become one of the key industries with high export turnover. With the world increased requirements and policies on food quality and safety and the expanding global market, the Vietnamese fisheries sector should be able to more than fulfil the basic market requirements. Vietnam has improved every activity in the management of the fisheries sector, producing products of good quality that are safe for human consumption. The changes and improvements are reviewed through laws and regulations and activities of the competent authorities and operations management of processing facilities related to quality control and food safety in the food chain. Based on the comparison of some important indicators related to the fish processing industry between Vietnam and Iceland, the present weak points of Vietnam are identified, aiming to propose further improvement.

TABLE OF CONTENTS

1. Introduction.....	5
1.1. Scope of study	7
1.2. Purpose of study.....	7
2. Methodology	7
3. Principle requirements for safety of fisheries products.....	8
3.1. Prerequisite requirement to HACCP system for food safety.....	8
3.2. Main principles of HACCP for food safety	9
4. Legal requirement of European Union countries for fisheries products	9
5. Fishery quality management in Vietnam.....	10
5.1. The legal framework	10
5.2. Role of official participants in quality control and surveillance.....	11
5.3. Inspection procedure.....	12
5.4. Certification of final products for export	13
5.5. Residue Monitoring Procedures for fish aquaculture	13
5.6. Food safety control in the fish industry in Vietnam	15
5.6.1. Prerequisite Condition	15
a. Design and layout of processing facility.....	15
b. Structure of processing facilities.....	18
c. Equipment and tools	18
d. Personnel	18
5.6.2. Good Manufacturing Practice (GMP).....	18
5.6.3. Sanitation Standard Operating Procedure (SSOP).....	19
5.6.4. Hazard Analysis and Critical Control Point (HACCP) plan.....	19
5.6.5. Traceability and recall.....	20
6. Fisheries quality management in Iceland	20
6.1. The legal framework	20
6.2. Role of official participants in quality control and surveillance.....	20
6.3. Inspection procedure.....	22
6.4. Accreditation.....	23
6.5. Residue Monitoring Procedures for fish aquaculture	23
6.6. The fish industry control in securing food safety	23
6.6.1. Design layout of processing facility	24
6.6.2. Structure of processing facilities.....	24
6.6.3. Equipment and tools	24
6.6.4. Personnel.....	24
6.6.5. Good Hygiene Practises (GHPs).....	27

7. Discussion	28
7.1. <i>Laws and regulations on fisheries quality control and management</i>	28
7.2. <i>Competent Authority</i>	28
7.3. <i>Quality and safety management for fish aquaculture</i>	29
7.4. <i>Inspection of processing conditions in regards to food safety</i>	29
7.5. <i>Certification</i>	29
7.6. <i>Prerequisite Condition</i>	30
7.7. <i>Prerequisite Programs and HACCP plan</i>	31
7.8. <i>Traceability and recall procedure</i>	32
8. Conclusions.....	32
9. Recommendation for improvements to Vietnam	33
Acknowledgements	34
Reference	35
ANNEX 1.....	38
ANNEX 2.....	39
ANNEX 3.....	40
ANNEX 4.....	50

List of figures

Figure 1: Flow diagram for the methodology used in the project.	8
Figure 2: Organizational chart for the fish quality management in Vietnam (Pers. Obs)	12
Figure 3: Role of participants in the residue monitoring program for aquaculture in Vietnam (Per.obs.2000).	14
Figure 4: Model design of a frozen basa catfish processing establishment in Vietnam (Per.obs.com).....	17
Figure 6: MAST organization chart (MAST, 2008).....	21
Figure 7: Structure of inspection system in Iceland (Zoega, pers.com)	22
Figure 8: Model design of frozen fishery processing establishment in Iceland (Gunnardóttir, pers.com)	26
Figure 9: Model of traceability from catch to processing in Iceland (Einarsson, 2008)	28
Figure 12: Illustration between Country level and Operation level (Gorris, 2003).....	31

List of tables

Table 1: Notifications of bad product by country of origin of the product in 2006 and 2007 (Europa, 2007).....	6
Table 2: Rating of fish processing plants from inspection by NAFIQAD	13
Table 3: Limits of substances allowed in aquaculture products of Vietnam	15
Table 4: Limits of substances allowed in aquaculture products of Iceland	23
Table 5: Difference in physical structure of processing facilities in Vietnam and Iceland	30
Table 6: Comparison between Vietnam and Iceland by workers and equipment	31

1. INTRODUCTION

Vietnam has a long tradition of fisheries and aquaculture practices. The fisheries sector plays an important role in the national economy. It is one of the country's key economic sectors. It made up about 6.1 % of Gross Domestic Product (GDP) in 2006 and earned about \$3.4 billion in export revenues. Total aquatic production increased almost 7% in 2006, while aquaculture production increased 14.6%. A strong export market continues to drive production, which is expected to reach 3.8 million metric tons in 2007. Export of fisheries products was expected to be \$3.6 billion (Ralph, 2007) but was more than \$3.7 billion in 2007. In the first eleven months of the year 2008, fishery products exported value was near 4 billion USD, fulfilling 85% of the yearly target and representing a year-to-year increase of 10.8%. Tra and basa catfish exports since the beginning of the year 2008 was estimated at 1.240 billion USD and 550.070 tons, a rise of 35 % over the corresponding period of 2006 (FICEN, 2008).

The total fresh water aquaculture area in Vietnam was about 254,800 ha in 2003 but has increased to about 1,065,000 ha (GSO, 2008). Catfish farming is very intensive with annual yields of 300-400 tons/ha. It is likely that small improvements in food quality, feeding efficiency and power usage could translate into large economic and environmental gains for producers. In 2007 basa catfish was exported to over one hundred countries world-wide and the main markets being the EU, Russia and the United States.

The Competent Authority for the official controls of the public health conditions of fisheries products for export to EU, Korea, Japan and China is The National Agro – Forestry – Fisheries Quality Assurance Department (NAFIQAD) under the Ministry of Agriculture and Rural Development. NAFIQAD is a governmental organizations with central headquarter in Hanoi and is comprised of six regional branches. NAFIQAD is responsible for the approval and supervision of establishments and issues certification of export for farmed fish to the EU. NAFIQAD is responsible for the Residue Monitoring Program for aquaculture and every month monitoring results are published on the website nafiqad.gov.vn. Today, there are 146 aquaculture areas in 35 provinces that are all included in the Residue Monitoring Program (NAFIQAD, 2005).

Fishing industry in Vietnam is constantly developing. In 2005, there were 171 establishments exporting to EU countries but today this number has increased to 302 establishments (SANCO, 2008). Among them, there are about 100 establishments in basa catfish production. The main products of pangasius are whole frozen fillets or portion. The processing facilities are constructed from durable materials but the operation however is all by manual labour. Most establishments receive their basa catfish raw material alive, which is an advantage in regards to the final product quality. The basa catfish is kept alive until processed.

In order to obtained access to high value markets like the EU countries, environment and processing conditions must be met and are stipulated in European Parliament Regulations and Decision such as (EC) 852/2004, (EC) 853/2004, (EC) 854/2004 (FSA, 2006).

Periodically the importing countries will detain shipment when the food safety is questionable. If unsafe food products entering the EU market are detected they will be detained and placed on a so called Rapid Alert System for Food and Feed (RASFF), Alert notifications are sent when a food or feed presenting a serious risk is on the market and when immediate action is required. Alerts are triggered by the Member State that detects the problem and has initiated the relevant measures, such as withdrawal/recall. The notification (Table 1) aims at giving all the members of the network the information to verify whether the concerned product is on their market, so they also can take the necessary measures. Information notifications concern a food or feed for which a risk has been identified, but for which the other members of the network do not have to take immediate action, because the product has not reached their market. These notifications mostly concern food and feed consignments that have been tested and rejected at the external borders of the EU (Europa, 2007).

Table 1: Notifications of bad product by country of origin of the product in 2006 and 2007 (Europa, 2007)

<i>Country</i>	<i>Number</i>	
	<i>2006</i>	<i>2007</i>
China	263	352
Turkey	254	293
The United States	236	191
Spain	117	177
Iran	244	133
Germany	117	122
France	86	109
Thailand	86	92
Poland	63	77
Italy	94	75
Brazil	90	58
The Netherlands	46	52
United Kingdom	67	52
China (Hong Kong)	29	50
Nigeria	29	49
Argentina	75	48
Vietnam	68	45
Iceland	0	1

In 2006, 68 lots of foodstuff from Vietnam entering the EU market did not meet the requirements of EU standard of which 43 lots were fishery products and in 2007 among 45 lots of foodstuff 18 lots of fisheries products were rejected. The main reasons for the rejection of the fisheries products were due to aquaculture products with high concentration of heavy metals (sea fish), bacterial infection and banned antibiotics (aquaculture fish). During the same period only one notification came from Iceland (Table 1).

1.1. Scope of study

This study focused on the legal framework in Vietnam and Iceland and how legal requirements are implemented. Comparison will be made to the official system in Iceland with the aim of analysing whether an improvement could be facilitated in Vietnam from the experiences learned in Iceland. The laws and regulations are on quality control for frozen basa catfish products (*Pangasius hypophthalmus*) in Vietnam and the laws and regulations applied in Icelandic fisheries to quality control for frozen cod fish products (*Gadus morhua*). Competent authority for this study is NAFIQAD in Vietnam and Iceland Food and Veterinary Authority (MAST) in Iceland. Furthermore the study will assess the quality control of basa catfish from farm to fork in Vietnam and the processing of cod in Iceland.

1.2. Purpose of study

Some of the fisheries products from Vietnam do not fulfil EU standards and for that reason it is necessary to review and assess the current quality control system applied in the country. The main objective of the project is to assess and improve the quality and safety of the fish processing and export in Vietnam and to review the quality and safety management of fish processing in Vietnam with emphasis on the production of farmed pangasius.

Establishments have built on and applied quality control program by Hazard Analysis and Critical Control Point (HACCP) program, including GMP, SSOP and HACCP plan for their products. This study will for that reason assess their HACCP program and recommendations made based on information gathered from the study and experience gained in Iceland.

2. METHODOLOGY

Laws, regulations and other documents related to fisheries and fish production in Vietnam and Iceland and/or EU were reviewed in terms of contents of fisheries quality management. Furthermore information on fish quality and safety management was reviewed to find strong and weak points. The implementation of the competent authorities in verifying the processing establishments was studied and compared to the activities in Iceland. The comparison was based on housing and equipment, personnel, end-product testing, environmental issues and the design and layout of the facilities. Quality and food safety management program, including traceability and product recall in Vietnam were reviewed and compared to the situation in Iceland. Steps of the study are illustrated in Figure 1.

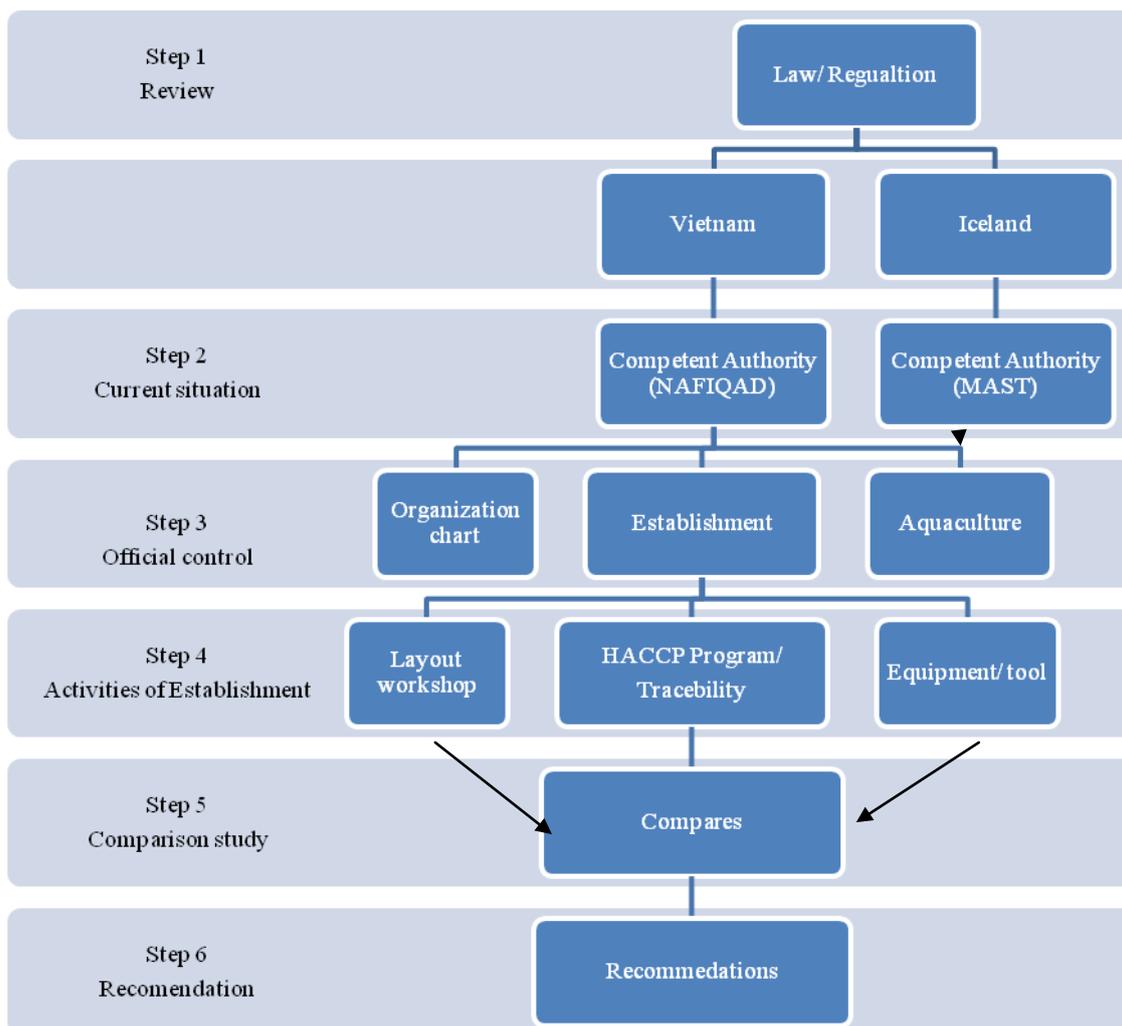


Figure 1: Flow diagram for the methodology used in the project.

3. PRINCIPLE REQUIREMENTS FOR SAFETY OF FISHERIES PRODUCTS

3.1. Prerequisite requirement to HACCP system for food safety

The design of fish processing facilities is important to reduce the possibility of contaminating food during processing and handling. The design of new buildings, or the improvement of the existing buildings and equipment, should respect the following general principles (Richard Bonne *et al.*, 2005):

- The plant should have at least four doors: one door for the entry of raw materials, one door for the entry of production staff, one door for the shipment of finished products and one door for waste disposal.
- The onward flow principle that should ensure a forward progression of products, without back return.
- Production lines should not cross or overlap.
- Separation of cool and warm zones.
- Clean and dirty areas should be separated.

3.2. Main principles of HACCP for food safety

Food safety based on Hazard Analysis Critical Control Points (HACCP) is required in all main importing countries and for protecting the health of the consumer. Enforcement of Good Manufacturing Practice (GMP) and Good Hygiene Practice (GHP) constitute essential prerequisites for the transition to the implementation of HACCP methodology (Richard Bonne *et al.*, 2005).

Current understanding of food safety management and the desire of most industrial countries to be responsive to consumers and efficient in the use of public resources has brought about changes in food safety regulatory system. A progressive food safety regulatory system includes (L. Unnevehr and Hirschhorn, 2000):

- Consolidated authority with ability to address the food system from farm to table and move resources from the most important sources of risk.
- Use of comparative risk assessment to help prioritize public action.
- Cooperation with industry and consumers to provide information and education.
- Use of HACCP principles to promote prevention and industry responsibility in place of prescription and inspection.
- An open decision making process that allows stakeholder participation.
- Evaluation of public health outcomes.

4. LEGAL REQUIREMENT OF EUROPEAN UNION COUNTRIES FOR FISHERIES PRODUCTS

The EU market is big for seafood and aquaculture products. The requirements of the market are strict with regards to safety and high quality of the fisheries products. Imports of fisheries products into the European Union are subject to official certification, which is based on the recognition of the competent authority of the non-EU country by the European Commission. For the safety of the consumer The European Commission has brought forward regulations such as (EC) 178/2002, 852/2004, 853/2004, 854/2004. In order to import to EU, countries outside the EU need to proof for the EU that their laws and regulations are equivalent to the EU regulations and that the competent authority has control over the production in their country. Regulation (EC) 178/2002 referred to as the General Food Law Regulation provides the basis of the European Food Safety Authority, and takes the importance of impartial scientific advice and forwards on emerging food issues to the EU commission. The regulation also sets out the general responsibility of food businesses to comply with the law and the local competent authorities to inspect and enforce. Regulation (EC) No 852/2004 of the European parliament and of the council from 29th April 2004 deals with hygiene of foodstuffs, principles including primary responsibility for food safety which rests with the food business operators (FBOs) and ensuring safety throughout the food chain starting with primary production and maintaining the cold chain and general implementation of procedures based on the HACCP principles. It also covers the application of good hygiene practice. The regulation applies to all stages of production, processing and distribution. It lays down

requirements of general hygiene provision for primary production and lays down general hygiene requirements for FBOs carrying out at any stage of production, processing and distribution of food. FBOs, should ensure that all the requirements are properly implemented to ensure food safety.

According to the EU regulation FBOs should have in place, implement and maintain permanent procedures or procedures based on the HACCP principle for food safety management program. The HACCP plan has seven principles:

- Identifying any hazards that must be prevented, eliminated or reduced to acceptable levels.
- Identifying the critical control points (CCP) at the step or steps at which control is essential to prevent or eliminate a hazard or reduce it to acceptable levels.
- Establishing critical limits (CL) at CCP which separate acceptability from unacceptability for prevention, elimination or reduction of identified hazards.
- Establishing and implementing effective monitoring procedures at CCP.
- Establishing correction actions (CA) when monitoring indicates that a CCP is not under control.
- Establishing that procedures verify to the principles and work effectively.
- Establishing procedures for keeping documents.

In general hygiene requirements for all food business operators consider the layout, design, construction, site and size of food premises to avoid or minimize cross contamination to fish in the processing.

In the EU the Health and Consumer Protection Directorate General (DG SANCO) is the Public authority for the health of European citizens. The EU plays an additional role as EU actions complement the Member States' national health policies (DG-SANCO, 2008). The European Food Safety Authority (EFSA), which covers all stages of food production and supply, from primary production to the safety of animal feed, right through to the supply of consumers with food. It collects information and analyses new scientific developments so it can identify and assess any potential risks to the food chain. It can carry out scientific assessments on any matter that may have a direct or indirect effect on the safety of the food supply, including matters relating to animal health, animal welfare and plant health (EFSA, 2008). To export fisheries products into the EU market, the fish processors must be issued a number code by local competent authority for the recognition of the EU. In order to check the HACCP system, inspectors from EU also visit to the processing facilities and institutions.

5. FISHERY QUALITY MANAGEMENT IN VIETNAM

5.1. The legal framework

Goods Quality Law No. 05/2007/QH12 was promulgated by the Government of Vietnam on 21st November 2007. This Decree stipulates principles to goods quality and goods quality management. This law also stipulates the rights and obligations of organizations and individuals producing and trading products, goods and organizations and individuals work related to the quality of products and goods, quality products management and goods. Products quality is the responsibility of the

producers and businesses to ensure safety for people. The responsibility is with the competent authorities to enforce provisions of the law on product quality and goods.

According to Decision No. 2744/QD-BNN-HTQT dated on 8th September 2008 by the Ministry of Agriculture and Rural Development (MARD), the National Agro – Forestry – Fisheries Quality Assurance Department (NAFIQAD) was established. NAFIQAD is the competent authority for inspection and certification of fisheries in Vietnam. It should inspect the safety hygiene and quality of facilities and update the list at approved establishments. NAFIQAD has six regional centres located in six cities or provinces important to fish production. These centres are responsible for planning and implementing official control in the fisheries product businesses.

Decision No.117/2008/QD-BNN (11th of December 2008 issued by MARD) clearly defines implementation agencies to inspect and recognize the safety and hygiene conditions of fisheries facilities, the regulation promulgated procedures and frequency of inspection and the responsibilities of the parties.

The Decision No. 650/2000/QD-BTS dated 04th August 2000 issued by MoFI on the regulation of governmental inspection and certification for the quality and hygiene safety of fishery products has been revised and updated by the Decision No.118/2008/QD-BNN of MARD dated on 11th of December 2008 (preciously 650/2000/QD-BTS dated 04th August 2000 issued by MoFI), stipulating order, process, content of inspection and certification to quality and hygiene safety of fisheries products.

To manage aquaculture and food quality and safety for consumers, MoFI issued Decision 15/2002/QD-BTS 17th of May 2002 on a monitoring program for chemical contaminants and residues in aquaculture animals and aquaculture products. Regulated procedures for implementing of the program are defined obligations, rights and responsibilities of parties from owner of farm and business of veterinary drugs to competent authority for controlling and monitoring of the program. In addition there is decision No. 07/2005/QD-BTS by MoFI on 24th of February 2005, promulgating a list of veterinary drugs permitted, restricted and banned for use in fisheries production, distribution and trading.

Along with residue monitoring program, the MARD has issued regulations on Bivalve Mollusks Monitoring Program (Decision 131/QD-BNN dated on 31st of December 2008).

5.2. Role of official participants in quality control and surveillance

Figure 2 shows the organisation of the fish quality management in Vietnam. The overall responsibility of the fish quality management in Vietnam is with the Ministry of Agriculture and Rural Development (MARD). Under MARD is the The National Agro – Forestry – Fisheries Quality Assurance Department (NAFIQAD) that is the implenting party of the fish quality management. NAFIQAD branches have four divisions carrying out various responsibilities. Under each NAFIQAD office there are also some provincial offices that carry out inspections on smaller processing facilities, vessels, landing sites and fish markets (pers. obs.com).

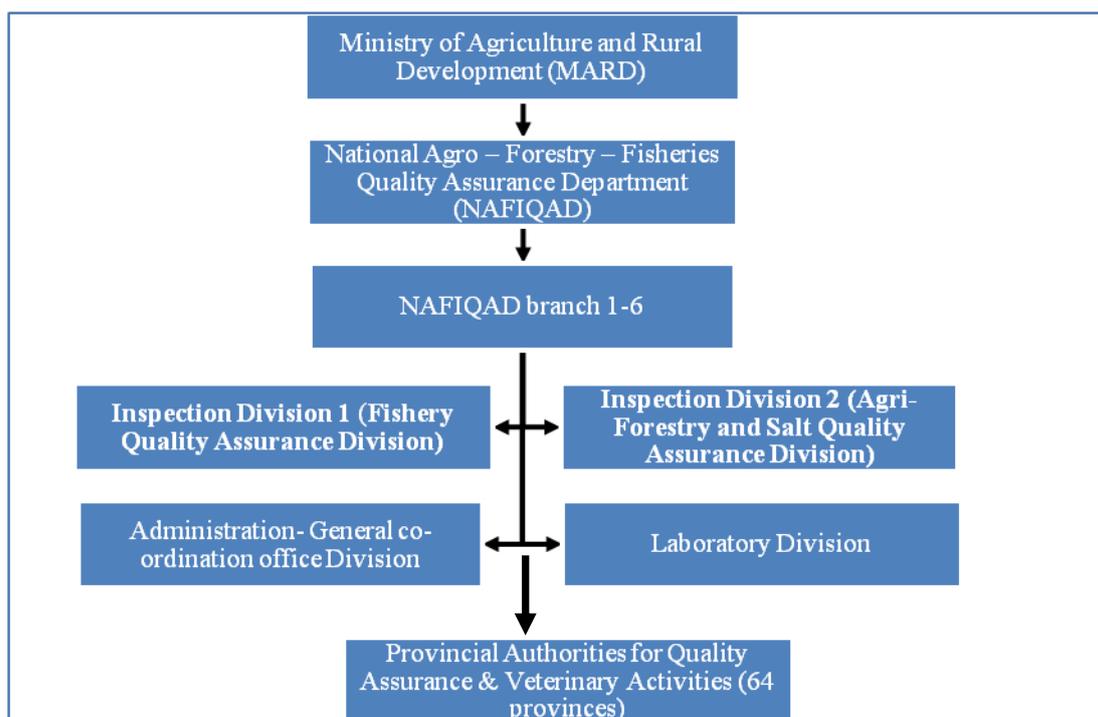


Figure 2: Organizational chart for the fish quality management in Vietnam (pers.obs.)

The National Fisheries Quality Assurance and Veterinary Directorate (NAFIQAVED) was established in 1995 and has now been The National Agro – Forestry – Fisheries Quality Assurance Department (NAFIQAD). On 17th of December 2008 the MARD issued Decision No. 4025/QD-BNN-TCCC to No. 4030/QD-BNN-TCCC on the establishment of NAFIQAD Branch 1 to 6. Promulgating the responsibility and function of NAFIQAD, in the management of quality, safety and hygiene of fisheries products, the specific tasks of NAFIQAD head office is:

- Management and co-ordination of the official quality assurance system.
- Management and organization of product testing before export.
- Management of fish diseases of exported and imported fish.

5.3. Inspection procedure

NAFIQAD is responsible for conducting the inspection in fish processing establishments (Decision No. 117/2008/QD-BNN dated on 11th December 2008 of MARD). Inspections are implemented using a detailed inspection form or checklist (see Annex 1). The results from each inspection are summarized from the checklist of inspection to rate the performance of the fish processing establishments (Table 2).

Table 2: Rating of fish processing plants from inspection by NAFIQAD

Mistake Class	Minor (Mi)	Major (Ma)	Serious (Se)	Critical (Cr)
A	≤ 10	≤ 5	0	0
B	-	≤ 10	≤ 2	0
C	-	≥ 11	≤ 4	0
D	-	-	≥ 5	≥ 1

Note:

- *Critical (Cr) means wrong in comparison with the standard, foodstuff is not safe, affecting the health of consumers.*
- *Serious (Se): means wrong in comparison with the standard, if prolonged will cause loss of safety of foodstuff, but not critical.*
- *Major (Ma): means wrong in comparison with the standard and may affect safety of foodstuff, but not serious.*
- *Minor (Mi): means wrong in comparison with the standard, hindering control of hygiene, but not as major.*

Processing facilities that are rated A or B are allowed to export their products but the frequency of testing is higher for products from companies that are rated as B. Rating of C does not allow exportation of products but they can be sold on the domestic market following official inspection. Facilities rated as D are not allowed to operate.

Frequency of periodic inspection for companies rated as A or B is twice per year to establishments that process high risk products and yearly to other establishments which do not process high risk products. For companies rated as C the frequency of inspection is twice a month (MARD, 2008 e).

5.4. Certification of final products for export

Before exporting fisheries products to EU, Japan, Russia, Korea, China, Singapore and Switzerland, establishments must register the shipments to NAFIQAD. Inspectors of NAFIQAD visit the establishments to take samples for sensory, chemicals and microbiological analysis. They also check the export records, the labelling, packaging and the temperature of the cold storage. If test results are according to the requirements of the regulations, NAFIQAD will provide a health certificate for the shipment.

5.5. Residue Monitoring Procedures for fish aquaculture

Vietnam has implemented a Bivalve Mollusks Monitoring Program and a Residue Monitoring Program for fish aquaculture (see section 5.1). The roles of participants in these programs are shown in the Figure 3.

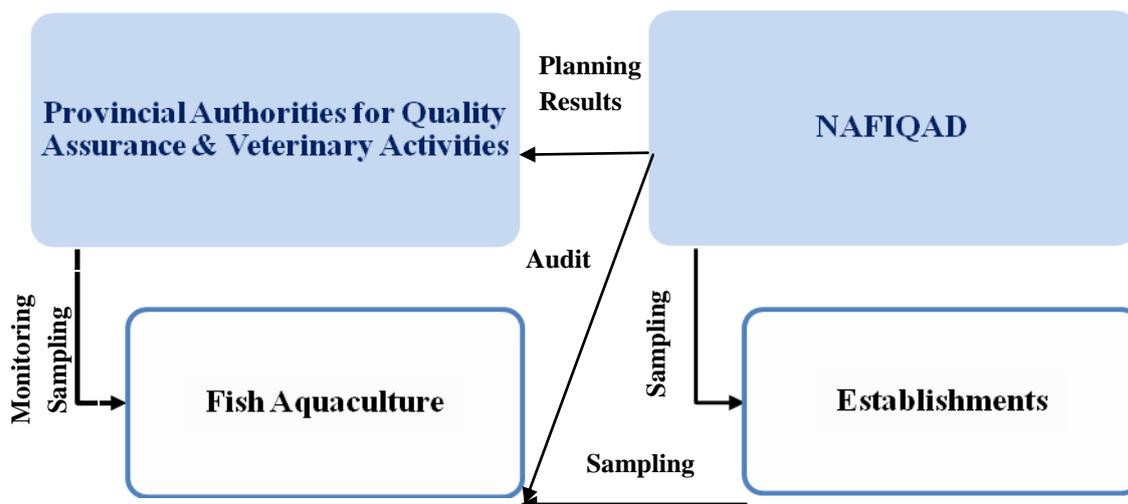


Figure 3: Role of participants in the residue monitoring program for aquaculture in Vietnam (Per.obs.com).

The Decision No. 130/2008/QĐ-BNN of MARD dated on 31st of December 2008 stipulated the responsibilities of NAFIQAD towards aquaculture. NAFIQAD is responsible for the approval of aquaculture farms. For aquaculture activities, NAFIQAD has established a Residue Monitoring Program plan (Annex 1). The Residue Monitoring Program includes the time of the sampling, test criteria of samples, the sampling periods and quantity of samples to be taken. Samples are collected monthly for testing from fish, veterinary drugs, biological products and feed by the Provincial Authorities for Quality Assurance and Veterinary Activities. The samples are sent to NAFIQAD laboratories. The staff of the Provincial Authorities for Quality Assurance & Veterinary Activities can change the test criteria and the number of samples if they realize a problem at the farm. Six months per year NAFIQAD will verify the farm and sample activities of Provincial Authorities for Quality Assurance & Veterinary Activities. Today there are 141 areas under control of the Residue Monitoring Program in Vietnam (MARD, 2008 a).

Monthly control results are sent to relevant bodies including the Provincial Authorities for Quality Assurance and Veterinary Activities, establishments and the farm owner and the results are placed in a form (Annex 2). The farmed basa catfish are harvested at 6 months old thus samples are frequently scheduled to be taken when fish are 2-5 months old, 5-6 months old and 6 months. Sample size is taken depending on the harvesting yield; normally one sample is taken for every 100 MT. Substances tested for are shown in table 3 along with the maximum residue.

Table 3: Limits of substances allowed in aquaculture products of Vietnam

Substance groups	Criteria for control	MRL - Maximum residue limit (ug/kg)
B3a Group: Chlorinated pesticides (including Polychlorine Biphenyl - PCBs	Aldrin	200
	Dieldrin	200
	Endrin	50
	Heptachlor	200
	DDT	1000
	Chlordane	50
	BHC	200
	Lindane	1000
	Sum of dioxins	0,4
Sum of dioxins and dioxin-like PCBs	0,8	
B3c Group Heavy metal	Pb	200
	Cd	500
	Hg	500
Group A1	Diethylstilbestrol	Not allowed
Group A3	Methyltestosterone	Not allowed
Group A6	Chloramphenicol & Nitrofurans (AOZ, AMOZ, SEM, AHD)	Not allowed
Group B1	- Group Tetracycline:	
	Tetracycline	100
	Oxytetracycline	100
	Chlotetracycline	100
	- Group Sulfonamide (9).	100
	- Group Quilonone (6)	100
	Oxolinic acid	
- Trimethoprine	50	
- Flophenicol	1000	
Group B2a	Trichlofon	Not allowed
Group B3d	Aflatoxin (4)	4
Group B3e	Green malachite &	Not allowed
	L-Green malachite	

5.6. Food safety control in the fish industry in Vietnam

The food safety management at the industrial level in Vietnam is secured through three basic operations that are the: i) prerequisite conditions, that deals mainly with the basic structure and layout of the processing facilities; ii) the prerequisite program, that covers the Good Manufacturing Practices (GMP) and the Sanitation Standard Operating Procedures (SSOP) and iii) the Hazard Analyzed Critical Control Point (HACCP) program.

5.6.1. Prerequisite Condition

The prerequisite condition must be secured at the fish processing establishments before constructing and implementing the quality program. Prerequisite condition includes design and layout of processing facilities, equipment and tools and as well as personnel. The requirement of the prerequisite conditions depends on kind of products being produced. For frozen basa catfish, prerequisite conditions are as follows:

- a. Design and layout of processing facility

Depending on the nature of the processing activities, processing facilities should be designed and constructed to ensure that contamination is minimized. The design and layout must permit appropriate maintenance, cleaning and disinfections and minimize air-borne contamination. Surfaces and materials used, especially those in directly contact with food must be non-toxic as well as suitably durable and easy to maintain and clean. Production lines must be arranged by a reasonable flow of its own raw materials, finished products, packaging materials and disposal of waste in processing which can minimize cross contamination during processing. Processing room must be of appropriate size and be able to be disinfected. The surfaces of walls and floors must be made of impervious materials with no toxic effects. Walls must be designed in such way that the processing area is protected from outside contamination and pets, as well as to the height appropriate to the operation. The windows and the doors must be constructed to minimize the build-up of dust and be easy to clean (MOFI, 1998 b). The model design of a frozen basa catfish processing establishment in Vietnam is shown in figure 4.

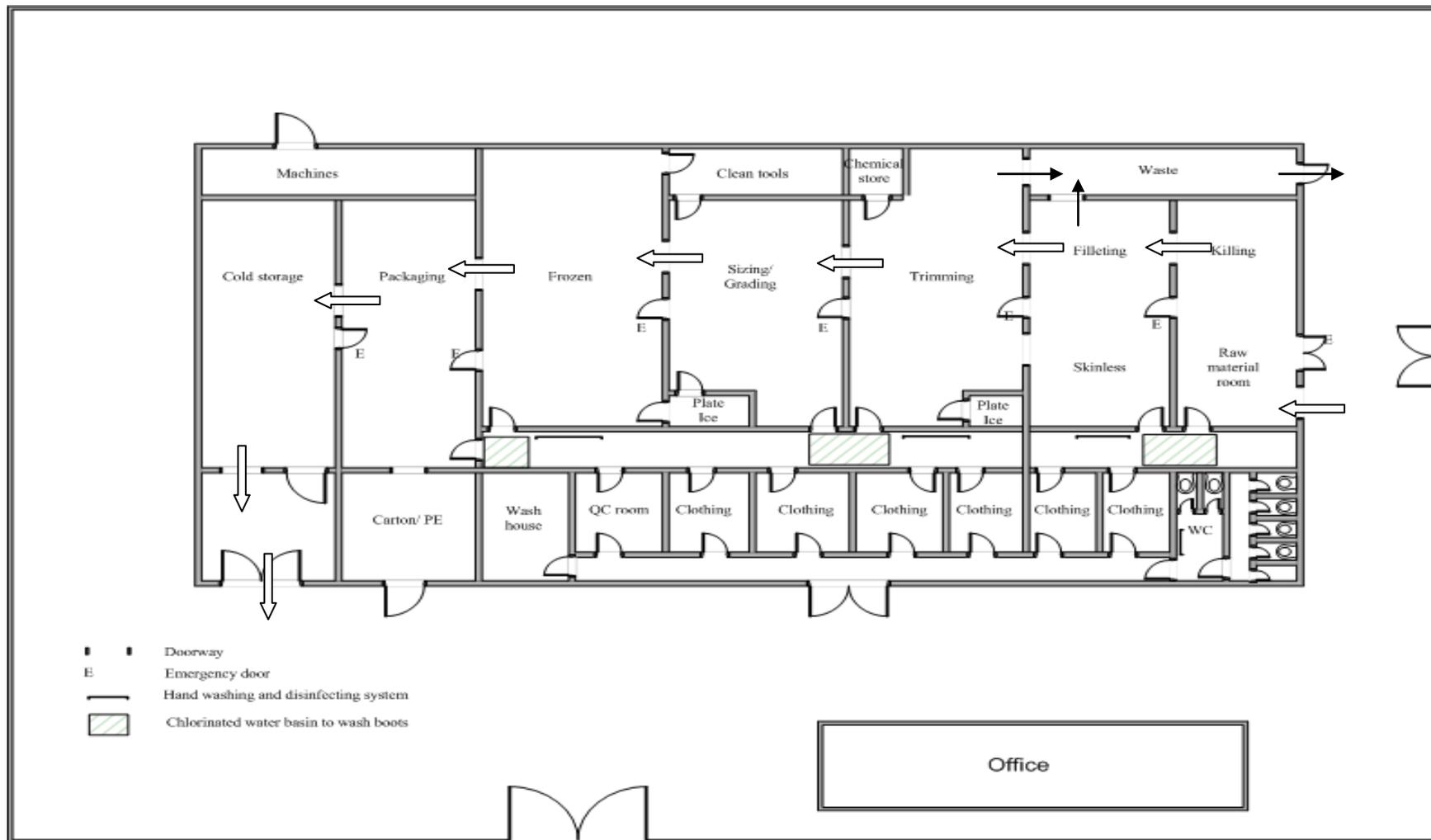


Figure 4: Model design of a frozen basa catfish processing establishment in Vietnam (Per.obs.com)

b. Structure of processing facilities

The structure within a food establishment must be built of durable materials and be easy to maintain, in accordance with the nature and scale of production to ensure good hygiene. Surface materials should not contain toxic chemicals, be waterproof and be easy to clean and disinfect. The ventilation system and the waste water drainage system must be designed in such a way that it does not allow transfer from unclean areas to clean areas (not from the previous processing area to the next) (MOFI, 1998 b).

c. Equipment and tools

Common requirements for equipment and tools, including surfaces is that they are made of durable materials and easy to clean (MOFI, 1998 b). Basa catfish processing factories have microbiological laboratories that are able to test for Total Plate Count, Coliform, Salmonella, Vibrio cholerae and Escherichia coli. In addition they have Elisa equipment for testing antibiotics.

d. Personnel

Personnel must be well trained and in good health. Staff involved in quality control are regularly updated with knowledge of quality control (MOFI, 1998 b). Fish processing in Vietnam is mainly carried out by manual labour. Therefore the number of workers in the fish processing factories ranges from 400 to 500. Some big factories may have more than 1,000 workers.

Establishments must have documents identifying the needs and planning for the training of employees. Demand for training must be reviewed after the period of appropriate time. The knowledge content of HACCP programs and training for each group of subjects must be suitable to HACCP, in accordance with standard and appropriate production conditions of the establishment. Note files for each training class, the staff, and workers must be stored fully. Members of HACCP team and staff of laboratory departments have certificates of training from appropriate external companies.

5.6.2. *Good Manufacturing Practice (GMP)*

GMP is written for each processing step or several steps, if the same procedures apply to more than one, and include (MOFI, 1998 a):

- The manufacturing process that describes clearly the procedures used in the processing step.
- Justification of the procedures and necessary activities in the processing step.
- The implementation of those procedures and activities that needs to be implemented in order to secure the quality and safety of the product.

Responsibilities need specifically to be defined at each step of the GMP. Generally, the management of the processing facility is responsible for the implementation of GMP, and the workers at each step will perform all written GMP activities. Special responsibilities are placed on the quality control staff (QC) and their responsibilities

must be described in detail, including what is to be controlled, how it should be controlled, how frequently and how their activities should be recorded. All records are kept for at least as long as the shelf life of the product in question and for at least two years for frozen fisheries products.

5.6.3. Sanitation Standard Operating Procedure (SSOP)

There are ten main subjects to be covered in a SSOP program and for each subject there are four items that must be addressed:

- A goal/ aim.
- Current conditions at the establishment.
- Procedure for implementation.
- Responsibilities and record keeping.

Goals are needed for requirements to be achieved to ensure the safety of food. Current conditions of the establishment mean the full description of the conditions of material and structure of the equipment and establishment, which has links with domain of SSOP. In every SSOP the following must be included:

- Water and water supply system.
- Ice.
- Food contact surfaces.
- Prevention of cross – contamination.
- Personal hygiene.
- Product adulteration and contamination.
- Proper storage and use of chemicals.
- Health of employees.
- Pest control.
- Waste control.
- Protection for products to avoid the cause of the contamination.

The SSOP is verified by regular testing of microbiological contamination. For water and ice chemical and physiochemical parameters are also tested. Every establishment must construct a sampling plan for testing defined parameters that indicate the efficiency of the sanitary procedures that at least include sampling of workers hands and gloves and all food contact surfaces.

5.6.4. Hazard Analysis and Critical Control Point (HACCP) plan

HACCP plan has become the international reference system for food safety assurance. Tools for effective control need to be developed to implement HACCP program (P. Wareing and Carnell, 2007). Vietnam has applied a HACCP program with the general twelve steps (seven principles) since 1995. The twelve steps are: (MOFI, 1998 a)

Stage 1: Select a HACCP team.

Stage 2: Describe the product.

Stage 3: Identify intended use.

Stage 4: Construct a flow diagram.

Stage 5: On-Site Verification of the flow diagram.

Stage 6: List all the potential hazards, conduct a hazard analysis and consider control measures (Principle 1).

Stage 7: Determine Critical Control Points (CCPs) (Principle 2).

Stage 8: Establish critical limits for each CCP (Principle 3).

Stage 9: Establish a monitoring system for each CCP (Principle 4).

Stage 10: Establish corrective action (Principle 5).

Stage 11: Establish verification procedures (Principle 6).

Stage 12: Establish documentation and record keeping (Principle 7).

5.6.5. Traceability and recall

According to 28TCN129:1998 standard of the MOFI regulated establishments must have written procedure on traceability and recall for products in order to withdraw products from the market if food safety is not ensured. Establishments must implement the procedures and inform the authorities in case withdrawal of products from the market is activated.

6. FISHERIES QUALITY MANAGEMENT IN ICELAND

6.1. The legal framework

Main laws and regulations regarding to safety and quality management of fisheries products are the Foodstuffs Act 93/1995 by Ministry for Environment on 28th of June 1995. This Act is to ensure as far as possible the quality, safety and wholesomeness of foodstuffs for the domestic market. Besides that there are also Acts such as Public Health and Pollution Control Act No.7/1998, Act No. 25/1993 on Animal Diseases, Act No. 66/1998 on Veterinarians, Act No. 54/1990 on the Import of Live Animals, Act 55/1998 on the Handling, Processing and Distribution of Seafood Products.

In order to assure safety and quality of fisheries products as well as to comply with the requirements of importing countries, Iceland has promulgated regulations based on act 55/1998 on the Handling, Processing and Distribution of Seafood Products. These include Regulation 233/1999 on Hygiene in Handling, Processing and Distribution of Marine Catch and Products, Regulation 558/1997 on Own Check s-System in Fisheries Products (HACCP), Regulation 429/1992 on Inspection of Fisheries Products, Regulation 450/1997 on the Operation of Accredited Independent Inspection Bodies in the fisheries sector, Regulation 512/2005 on Control of Health of Sea-cage Animals and their products in trade inside the EEZ (European Economic Zone) and Regulation 448/2005 regarding Control of Health of Aquaculture Animals and their Products on trade inside the EEZ.

6.2. Role of official participants in quality control and surveillance

The Act No. 167/2007, passed by the Icelandic Parliament on 14th of December 2007, provides for the establishment of the Iceland Food and Veterinary Authority (MAST) (Figure 5). The Act lays the foundation for the merger of authorities and services dedicated to food and agriculture related inspection and administration into a single inspection and administrative body, the Icelandic Food and Veterinary Authority (MAST, 2008).

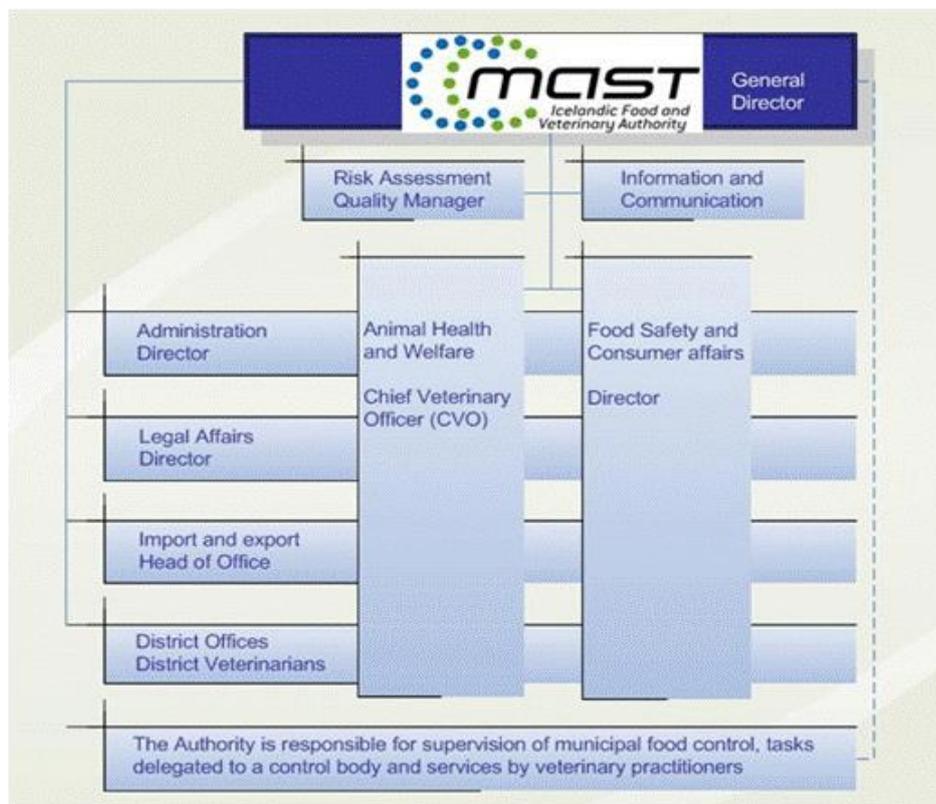


Figure 5: MAST organization chart (MAST, 2008)

On 1 January 2008 the Icelandic Food and Veterinary Authority (MAST) commenced operation as an inspection and administrative body, with the following primary roles:

- Food safety, control of primary production of animal products, including fish products, import and export control of all foodstuffs.
- Supervision of domestic food control by municipal authorities.
- Veterinary services.
- Plant protection services.
- Feed, seed and fertilizer services.
- Meat classification services.
- Administration of organic production of agriculture products.
- Management, monitoring of supplies and surveillance of animal welfare.

MAST is directly under the Ministry of Fisheries and Agriculture and is the implementing party of the relevant laws and regulations. As Iceland is an EFTA country and part of the European Economic Zone the EFTA Surveillance Authorities (ESA) makes regular visits to Iceland to inspect if the competent authorities are working in accordance to the EU requirements. Regular inspection to processing facilities are carried out by an independent inspection body and as the inspection bodies do not have any authority they are closely monitored by MAST. As the inspection bodies are required to be accredited in accordance to the international standard ISO 22000, they are also closely monitored and their work is verified by an international certified accreditation body (Figure 6).

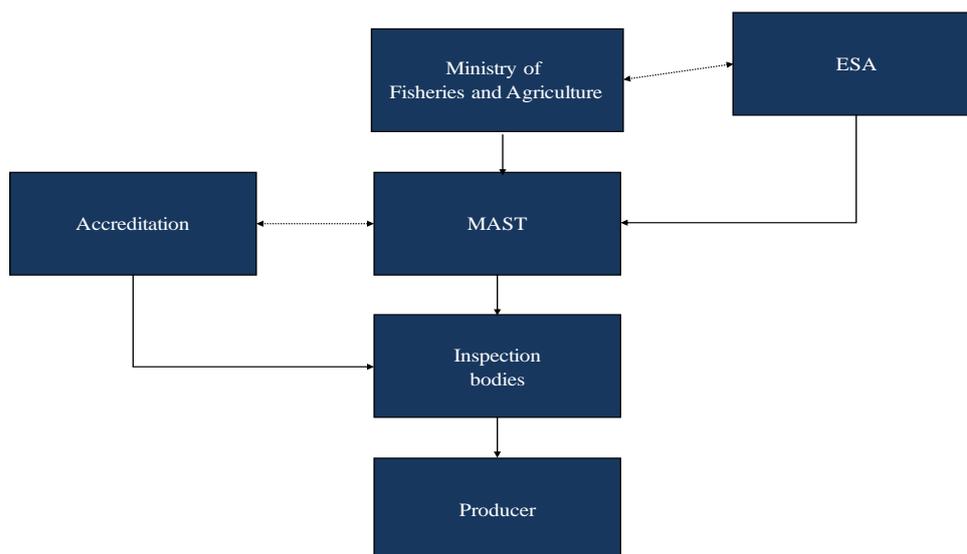


Figure 6: Structure of inspection system in Iceland (Zoega 2008, pers.com)

6.3. Inspection procedure

All official inspection in Iceland is guided by an inspection manual where the inspection procedures are described, the limits of deviations, and how to judge each inspection item is listed. The inspection manual is a practical version of the relevant regulations that the inspectors can use to evaluate if the structure and operations of fish establishments are in accordance with set laws and regulations (Per. obs. at MAST).

First inspection of a fish establishment is carried out by the competent authority (MAST) and after the establishment has been approved, regular inspections are made by an independent accredited inspection office in accordance to the inspection manual. Evaluations of defects are pre-defined by the competent authority as either a serious defect or simply a defect. If a serious defect is observed by the inspection body the competent authority is noticed within 24 hours and appropriate actions are taken by them to correct the problem. If only defects are observed during inspection a corrective action plan is made and regular inspection continues at a frequency of 4 times a year. If no serious defects are observed results of all inspection made by the inspection office is sent electronically to the competent authority where statistical analysis is made to evaluate the status of the fish industry and to co-ordinate and harmonize the efficiency of the inspection system (Per. obs. at MAST).

Results of inspection are reported in the Inspection certificate (Annex 4). If an establishment gets no non-conformities it will next be inspected according to frequency laid down by the MAST. On the inspection certificate inspector will evaluate one of three levels 0, D or S level (0: without remarks, and fit the time for next inspection, D: Defect and fit the time for next inspection, and S: Serious defect and corrections without delay). Inspectors do not classify the establishment on the inspection certificate (Per. obs. at MAST).

6.4. Accreditation

The fish inspection bodies are accredited through the Icelandic patent office that has a co-operation with the Swedish Accreditation body (SWEDAC). The accreditation bodies cannot perform a direct role on inspection of producers. However, one of the foreseeable consequences of the new system will be an increase in demand for accreditation of quality systems. In the future, accreditation bodies may therefore be expected to perform an important role on certification of quality management under the ISO 22000 on food safety and IFS and BRC standards, where part of the certification is conditional upon an “own checks” mechanism based on the principles of HACCP (Wallis, 1998).

6.5. Residue Monitoring Procedures for fish aquaculture

MAST is responsible for residue monitoring in live animals and animal products. The National residue control plan is based on the total national production and on the requirements of the Council Directive 96/23/EC. However, to ensure that all essential substance groups are included in the residues control plan and that appropriate residues are included in the scope, taking account of the availability of medicines on the domestic market and the likelihood of their use in each of the production sectors, so that the monitoring of residues has an effect on at least equivalent to that provided for in Council Directive 96/23/EC (FVO, 2007 a). The Substance group A1 (stilbenes), A3 (steroids), A6, B2a (anthelmintics), B3a (organochlorines), B3c (chemical), B3d (mycotoxins) and B3e (dyes, e.g. malachite green and leucomalachite green) were not included. The aquaculture products plans comprised only substance group B1 and only two substance within that group, i.e. oxolinic acid and oxytetracycline (FVO, 2007 a). Substances of sample are tested with maximum residue limit following the table 4.

Table 4: Limits of substances allowed in aquaculture products of Iceland

Substance groups	Criteria for control	MRL - Maximum residue limit (ug/kg)
B3a Group: Chlorinated pesticides (including Polychlorine Biphenyl - PCBs	Aldrin	50
	Dieldrin	50
	Endrin	50
	Heptachlor	50
	DDT	500
	Chlordane	100
	Sum of dioxins	0,4
	Sum of dioxins and dioxin-like PCBs	0,8
B3c Group Heavy metal	Pb	200
	Cd	50
	Hg	500
Group B1	Oxytetracycline	100
	Oxolinic acid	100

6.6. The fish industry control in securing food safety

In order to assure safety and quality of fisheries products to ensure for the consumers that they are wholesome, in line with quality requirements and processed under

satisfactory conditions of hygiene (MoFA, 2008), the requirement in Regulation (EC) No 852/2004 whereby food business operators carrying out any stage of production, processing and distribution of food after primary production and associated operations must put in place, implemented and maintain procedures based on hazard analysis and critical control point (HACCP) principles also permits simplification. The requirements of Regulation (EC) No 852/2004 are generally sufficient to ensure food safety in establishments carrying out retail activities involving the direct sale or supply of food of animal origin to the final consumer.

6.6.1. Design layout of processing facility

The fish processing plant is designed and constructed for giving adequate area for equipment, installations and materials storage. Processing rooms must be separated to prevent cross-contamination, as well as to protect pests from entering the processing facilities. Processing areas should also have enough lighting and ventilation (Per. obs. at MAST). The model design of a frozen fish processing establishment in Iceland is shown in figure 7. From that figure the following can be identified:

- Entry of workers, raw materials, packaging materials and chemicals are through different doors.
- Exit of waste and products is through different doors.
- The production line is designed in order to prevent crossing of products.
- Separation of unclean and clean areas is secured.
- Support areas like dressing rooms, toilets, washing hand system are in appropriate position (outside of the production area or before the workers go into the production areas).

6.6.2. Structure of processing facilities

The structure of processing facilities has to follow the EU regulation 852/2004/EEC and 853/2004/EEC. As an example the internal structure of the processing facilities are neat and of appropriate materials. The ceilings, walls, doors, windows, ventilation system, lighting system, water system, ice, transport systems, maintenance of packaging and cold storage must be designed and constructed to minimize the dirt accumulation and be easy to clean.

6.6.3. Equipment and tools

Most factories use conveyor belts to transfer operations of fish through the processing. Semi-products or final products are stored in plastic tubs and transported mechanically (per. Obs.).

6.6.4. Personnel

According to the General Requirements (food hygiene) – Codex Alimentarius (FAO, 1997), food hygiene training is fundamentally important. All people should be aware of their role and responsibility in protecting food from contamination. Therefore, they must be fully trained in food hygiene to a level appropriate to the operations they are supposed to perform. They also need to have good health. The staff involved in quality control is regularly updated with knowledge of quality control. The numbers

of workers are relatively low as the processing is highly mechanized. Workers are regularly tested for good health.

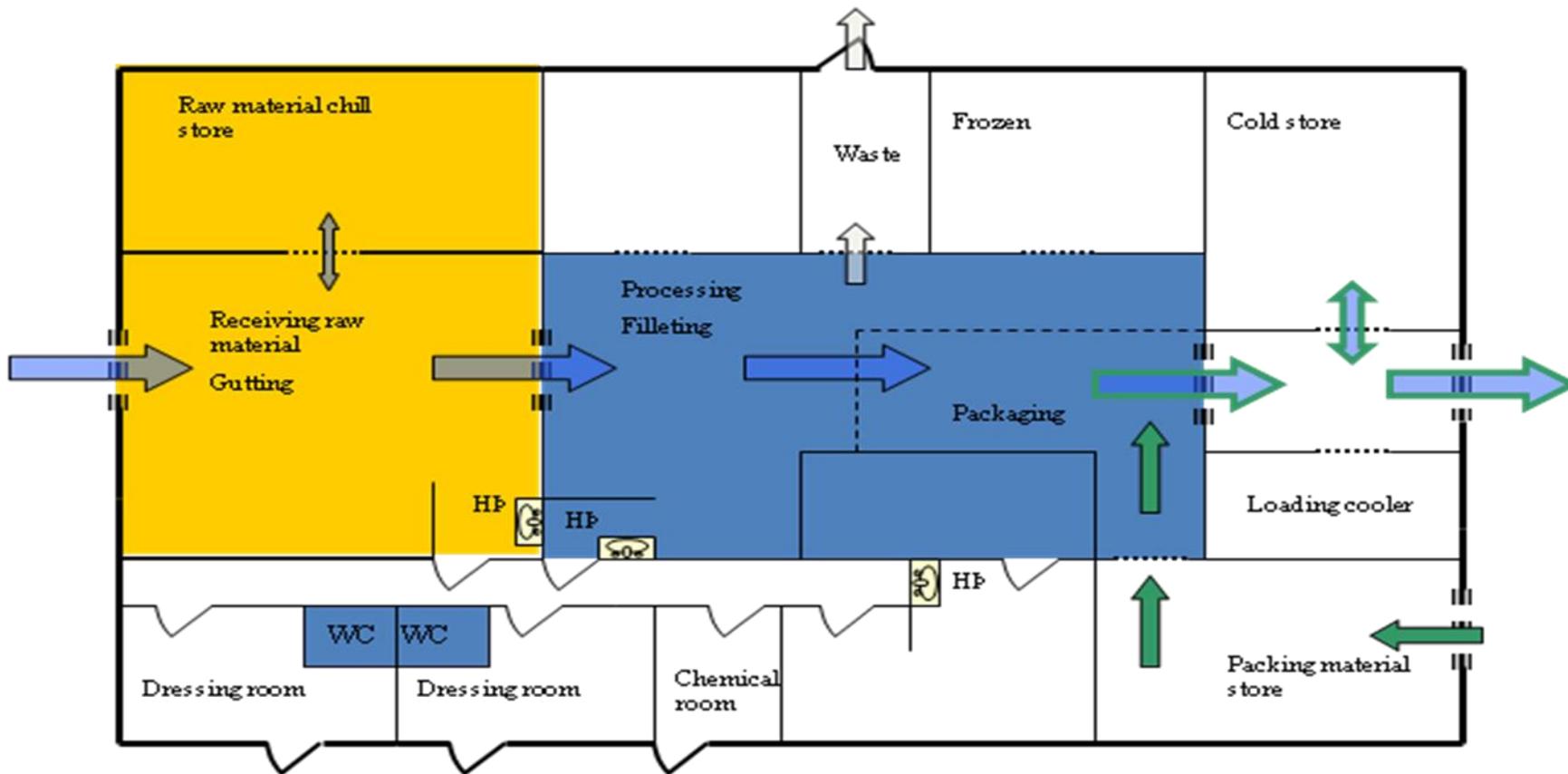


Figure 7: Model design of frozen fishery processing establishment in Iceland (Gunnardóttir, pers.com)

6.6.5. Good Hygiene Practises (GHPs)

Good Hygiene Practises have been in place in Iceland for many years in fish processing facilities. It is still the bases of the prerequisite program of the HACCP system along with the GHP. The basic components of the GHP are in most cases the same today although emphases on certain areas have changed like traceability that is becoming more important (per. obs).

GHP in Iceland covers the following items (Margeir.per.com):

- Operational conditions and procedures of GHP including contents following.
- Safety of water and ice (qualitative conditions) Chlorination.
- Sanitation and maintenance practices Cleaning Plan.
- Prevention of cross contamination.
- Personal hygiene.
- Protection of food from adulterants.
- Safe storage and use of toxic compounds.
- Control of employee health conditions.
- Pest control.
- Waste management.
- Transportation.
- Traceability and recall procedure.
- Training.

Of the above, the traceability and recall procedure system is done in a scientific way to ensure high reliability.

According Act 178/2002, food and feed business operators shall be able to identify any person from whom they have been supplied with a food, a feed, a food-producing animal, or any substance intended to be, or expected to be, incorporated into a food or feed. To this end, such operators shall have in place systems and procedures which allow for this information to be made available to the competent authorities on demand. Food and feed business operators shall have in place systems and procedures to identify the other businesses to which their products have been supplied. This information shall be made available to the competent authorities on demand. Food or feed which is placed on the market or is likely to be placed on the market in the European Community shall be adequately labelled or identified to facilitate its traceability, through relevant documentation or information in accordance with the relevant requirements of more specific provisions (Huetting *et al.*, 2005).

Traceability needs to be fully carried out throughout the whole production chain. In order to fulfil this requirement, processing plants should require raw material suppliers to submit a declaration of origin for raw materials of each fisheries batch. Iceland has been implementing a traceability system in the fish production sector at all stages. Data from catch, landing and processing is collected (Fisheries.is.2009). The model of traceability from catch to processing is shown in figure 8.

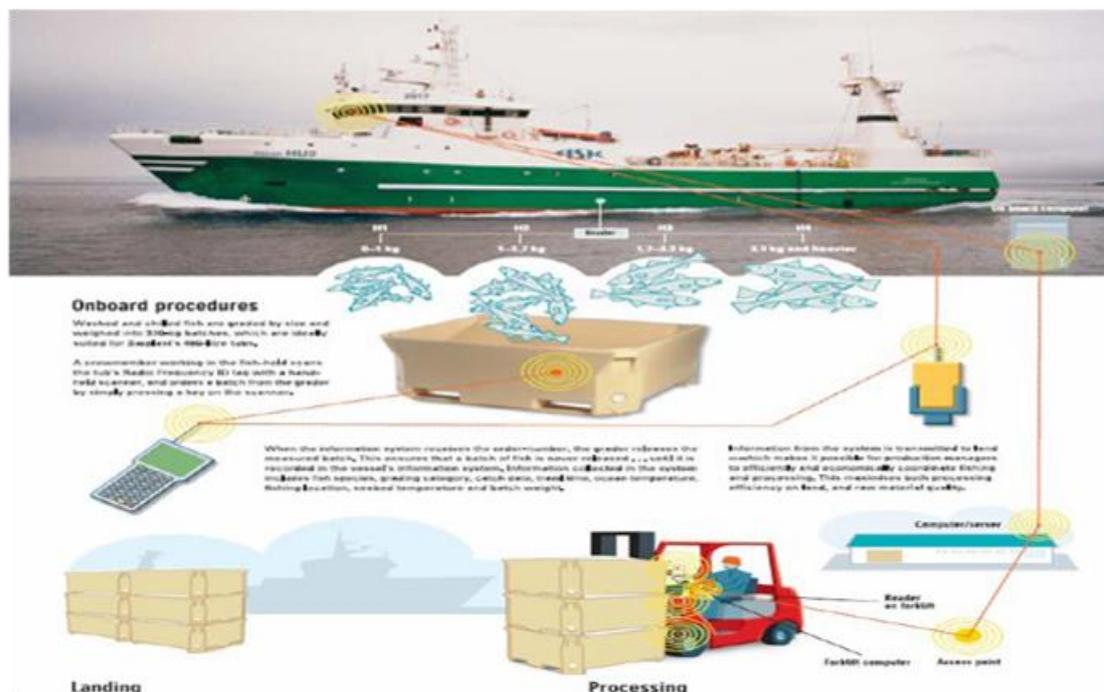


Figure 8: Model of traceability from catch to processing in Iceland (Einarsson, 2008)

7. DISCUSSION

7.1. Laws and regulations on fisheries quality control and management

In recent years Vietnam and Iceland have been updating their laws and regulations on quality and safety of fish production in accordance to global criteria. However, due to the social and economic differences between the countries, the fisheries sector in Vietnam is different from Iceland.

The domestic and imported raw material for production in Vietnam is regulated by the Ministry of Agriculture and Rural Development, but the products for the domestic market is regulated by the Ministry of Health. In Iceland, however both are regulated by the Ministry of Fisheries and Agriculture. Placing the whole food chain under one Ministry is in line with global developments.

Effective implementation of laws and regulations require not only people's awareness, but also coordination between Ministries and sectors. In Iceland the awareness of people is high and the laws and the regulations are implemented strictly, while in Vietnam awareness is not high, and in some cases the coordination of the Ministries or sectors is limited, so the effect of laws or regulations is not high.

7.2. Competent Authority

Both organizations NAFIQAD and MAST meet all requirements of the EU, and both are the competent authority office. A difference between Vietnam and Iceland is that in Iceland private third party inspection bodies conduct regular inspection activities.

In Vietnam this is done by the competent authority directly which perform evaluation on the plants own checks systems, the housing and equipment used for processing. The inspection bodies in Iceland do not have any authorities as within the MAST.

7.3. Quality and safety management for fish aquaculture

Vietnam and Iceland both have Residue Monitoring Program plan for fish aquaculture. However, the construction and implementation of the plan is different. For aquaculture in Iceland, substance group A1 (stilbenes), A3 (steroids), A6, B2a (anthelmintics), B3a (organochlorines), B3c (chemical), B3d (mycotoxins) and B3e (dyes, e.g. malachite green and leucomalachite green) are not included. The aquaculture products plans comprised only of substance group B1 and only two substances within that group, i.e oxolinic acid and oxytetracycline (FVO, 2007 a). For aquaculture in Vietnam, NAFIQAD has been implementing an approved control program. However, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAH) and dioxins are not in the program (FVO, 2007).

Iceland has a good monitoring program for marine aquaculture fish. This program ensures that fisheries products from the marine environment are safe in regards to environmental pollution. In Vietnam the control of pollutant in marine fish has not been implemented adequately and effectively, except for shellfish. The establishments themselves have to carry out the risk assessment and risk management of marine fisheries. This has led to the fact that some marine seafood products from Vietnam tested has contained pollutants above legal limits (heavy metals).

7.4. Inspection of processing conditions in regards to food safety

In Vietnam there are no factory or freezing vessels. The number of boats above 90HP was about 11,900 in 2003 (FICEN, 2004). Due to the high number of boats it will take many years to confirm their hygienic conditions with the current human resources available. Their numbers also affect the traceability of the raw material.

In Vietnam different regulations apply to different processing activities, for each regulation, work procedures are issued in a form of a check list that are used by official inspectors in verifying the different processing facilities. A different checklist is therefore used for different types of activities. In Iceland, however there is only one checklist being use to inspect different activities. The check list is simple and backed up by the inspection manual that gives greater details of what to inspect, how it should be inspected and what are the limits for each inspection item.

Frequency of periodic inspection in establishments in Vietnam is twice per year and yearly to other establishments. The frequency of periodic inspection in Iceland is four times per year. Based on the fact that low risk products are rarely detected on the list of rapid alert system of EU, Iceland could consider reducing the frequency of inspection on facilities producing low risk products.

7.5. Certification

In Vietnam, the final products are tested before a health certificate is issued for export, while in Iceland testing of the final product is not done except for verification purposes. This activity is costly in terms of time and money of the government and its

establishments. Vietnam is in the process of strengthening management activities, stabilising quality and securing the safety of the products, reducing the risk of shipments deviate from set standards of the importing countries. At presents Vietnam is implementing regulation to reduce testing for final products from establishments who have class A of production condition (MARD, 2008 d).

7.6. Prerequisite Condition

Comparison of layout of processing facilities in Vietnam and Iceland for a frozen fish products leads to the conclusion that the organization in Icelandic processing plants are simpler. Reason for this is that factories are highly mechanized, transfer links between the processors is good, workers are few and the surrounding environment is clean. Comparison of the structure of the several frozen fishery processing factories in Vietnam and Iceland results can be seen in table 5.

Table 5: Difference in physical structure of processing facilities in Vietnam and Iceland

Items	Vietnam	Iceland	Remark
Ceilings	Smooth, below are light system only.	Smooth but below there are many load pipes. Easy to accumulation of dirt, difficult to cleaning	In factories in Iceland: easy to accumulation of dirt, difficult to cleaning
Hand washing and disinfecting system for workers in workshop	Arranged at the front door entrance processing area	Arranged at the rearward door entrance of the processing area	Depends on awareness of workers and management of the factory to all workers required implementation
Cleaning and disinfecting facilities for processing premises, equipment, utensils	Most implemented manually	Most use high pressure tap, the pipeline that supply cleaning, disinfecting agents	In factories in Iceland cleaning is faster
Drainage of waste water	Road floating drainage of waste inside of workshops with width is larger, average 30cm	Road floating drainage of waste inside of workshops with width is small, average 10cm	Difficult to cleaning for the system in factories in Iceland
Ice	Layout of plate ice store is fixed in workshop, implemented manually.	There are ice pipeline that supply ice to everywhere.	Ice supply system is more advanced preventing a risk of contamination of ice.
Harmful animal and pest prevention and killing system	There are yellow or orange insect curtain at the doors of workshops	Not curtain at the doors	Necessary layout because insect in Vietnam are more intensive.
Cold store	The most maintained at appropriate temperature is – 18°C	The most maintained at appropriate temperature is - 25°C	Products in Cold store in Iceland are better. -18°C is the maximum allowed temperature.

The number of workers in processing establishments is often from 400 to 500 in Vietnam and some big factories may have more than 1,000. In Iceland, the number

of workers in a large factory is 30-50 workers that can have some advantages and disadvantages as seen in table 6.

Table 6: Comparison between Vietnam and Iceland by workers and equipment

Items	Vietnam	Iceland
Advantages	Easy to clean or disinfect. Production norm is low.	Production management is easy. Production area is smaller.
Disadvantages	Production management is difficult, easy to contamination. Production area is larger.	Difficult to clean or disinfect. Production norm is higher.

7.7. Prerequisite Programs and HACCP plan

Vietnam has a Decision No. 56/2008/QĐ-BNN by Ministry of Agriculture and Rural Development on 29th April 2008, promulgating regulation to inspect and certify for fish aquaculture. Depending on the inspection the factory can be certified at three levels: Better Management Practices (BMP), or Good Aquaculture Practices (GAqP) or Code of Conduct for Responsible Aquaculture (CoC) (figure 9) (MARD, 2008 c). However, not many aquaculture factories are built and certified for this program, so the competent authorities should have the appropriate measures to ensure the management programs will be developed equally in all establishments as it is in Iceland. At present activities in Iceland to ensure food safety is well developed, the parties have set up and implemented a good management program so the competent authorities can implemented safe monitoring programs for marine fisheries.

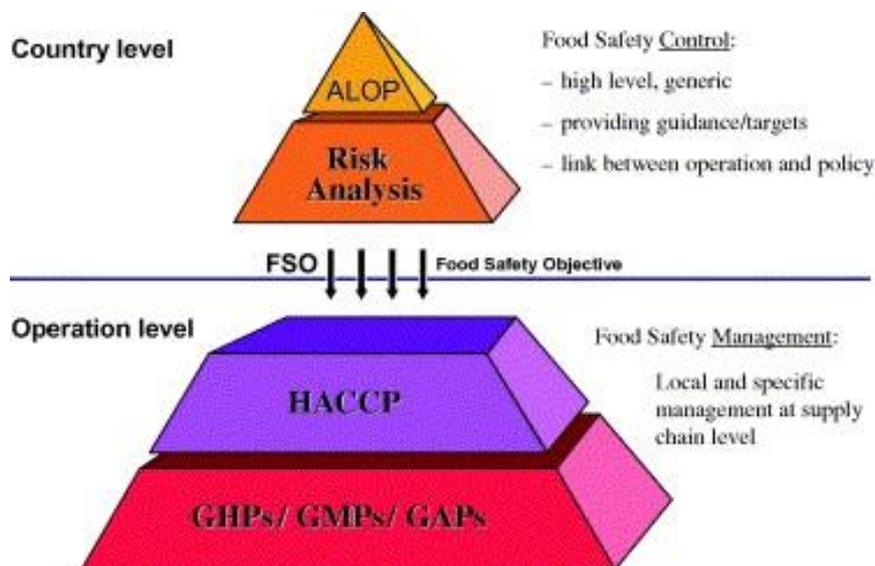


Figure 9: Illustration between Country level and Operation level (Gorris, 2003).

Both Vietnam and Iceland have prerequisite for HACCP derived from the general principle that is to ensure safety and hygiene to fisheries products and a platform to build the HACCP plan, but the implement action is different. Vietnam divided prerequisite for HACCP into three parts: prerequisite condition, GMPs prerequisite program and SSOPs. Prerequisite condition is the infrastructure, to maintain it or how to use it is defined in GMPs and SSOPs.

7.8. Traceability and recall procedure

Regulations in Iceland on traceability are more specific than in Vietnam. The regulation in Iceland is for different objects such as ice, fishing vessel/boat, auction market, primary processing and secondary processing (MATIS, 2007). For bigger vessels and fisheries processing factories, they have suitable equipment, so most of the necessary information is recorded automatically from catching to processing. Radio-frequency identification (RFID) system is being applied in Iceland.

8. CONCLUSIONS

Laws and regulations related fisheries products in Vietnam and Iceland do harmonize to the regulations of the European Union. The enforcement of laws and regulations in Vietnam is limited.

The competent authority for fishery management in Vietnam is NAFIQAD and in Iceland it is MAST. The organizations of structure and responsibilities have to meet the requirements of the EU. However activities of NAFIQAD have not been fully implemented

Both Vietnam and Iceland have residue monitoring programs for fish aquaculture. Vietnam has not built a specific monitoring plan for marine fish (except for shellfish). Iceland does not test banned antibiotics because they are not used.

Vietnam and Iceland have a checklist when inspecting processing establishments. In Iceland, the checklist is short with main contents listed. But in Vietnam, the checklists are long with description of details required for inspection.

Frequency of inspection between Vietnam and Iceland is different. In Iceland the frequency of inspection is not included in the regulation; it is a decision of MAST. But in Vietnam, it is frequency regulated. The regulation for frequency of inspection depends on the type of processing facilities.

Seafood products exported are certified in Vietnam. Competent authorities of Vietnam test the final products before they issue the certificate, but Iceland does not. As Iceland is a member of the EEZ there is a free movement into the European market of all products from Iceland.

At the processing establishments both Vietnam and Iceland have the prerequisite programs GMPs, SSOPs to build the HACCP program. The form of program is different, but the content is in accordance with the terms and conditions in each country.

Processing establishments in Vietnam and Iceland have applied food safety program by HACCP to ensure the safety of the consumers. Iceland has to distinguish clearly the responsibility of risk assessment and the ALOP at the country level, while Vietnam does not.

Fisheries processing factories in Iceland are using modern equipment, and production is highly automatic, while factories in Vietnam still produce manually.

Both Vietnam and Iceland have traceability regulations and recall shipment procedures. The fisheries sector in Vietnam has just started the application of traceability, while in Iceland, the traceability system has been applied for a long time.

9. RECOMMENDATION FOR IMPROVEMENTS TO VIETNAM

Vietnam should have measures to implement laws and regulations effectively. Competent authorities need to coordinate and synchronize with higher awareness and responsibilities for securing safe fisheries products.

Vietnam should invest money in a residue monitoring program to marine fish as well as residue monitoring program of fish aquaculture or monitoring program of shellfish.

Institutions need to strengthen measures to control the quality and safety of fish ports, fish markets and fish boats, by strengthening guidance and training of inspectors in local agencies, and proposes building regulations to ensure that management is effective.

Building checklist for inspection of condition of fish ports, fish markets and fish boats is needed.

Fisheries processing factories should work toward changing the method of production, using more automatic equipment, and modernization of production.

Agencies of the state should fully implement their regulations and have a better research program, risk assessment of fishery products, and more effective tools for the construction of HACCP program in the fisheries facilities.

Strict regulations and consistency are needed for a traceability system. A traceability system is only effective when the conditions for implementation of the food chain are met.

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ANNEX 1

The form of Residue Monitoring Program plan for a year (NAFIQAD, 1998)

Code of areas	Month	Fish of supplier	Feed	Vet. drugs	Quantity of fish	Kind of fish aquaculture	Test criteria of samples													
							A1	A3	A6		B1					B 2a	B 3a	B 3c	B 3d	B 3e
									CAP	NTR	TC	SUL	QUI	Trime	Flor					
<i>Provinces/ Cities</i>																				

ANNEX 3

MINISTRY OF FISHERIES
 NAFIQAVED
 No.: /CLTY-CL

**REPORT ON INSPECTION RESULTS OF PRODUCTION CONDITIONS
 FOR PROCESSING ESTABLISHMENT OF FROZEN FISHERY PRODUCTS (NAFIQAD, 1998)
 (Attached with inspection report dated.....)**

I. Name of the establishment:						II. Code number				
III. Date of inspection:						IV. Inspection manner:				
V. Inspection criteria and results:										
Item	Reference articles	Parameters	Valuation Results						Notes	
			Levels of valuation					General valuation		
			Acceptable	Mi	Ma	Se	Cr	In accordance with Regulation of Viet Nam		In accordance with Regulation of EU
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	28TCN 130 3.2.4,5,6 3.3.1 3.3.4.6 3.3.9.4 3.4.1.4 3.12.1.2 28 TCN 138 4.1	Facilities and equipment layouts: a. Actual possibility of contamination b. Not convenient for processing and cleaning			[]	[]	[]			

	91/493/EEC III.I.1								
2	28TCN 130 3.3.3 3.3.4.1.a 3.3.8.1 3.12.2 91/493/EEC III.I.2.a III.II.A.1	Floor of processing workshop and support areas: a. Lack of waterproof b. Unsmooth, unflat, insufficient slope c. The junctions between floor and walls are ungrooved d. Not maintained properly			[]	[]			
3	28TCN 130 3.3.5 3.3.7.7 3.12.2 91/493/EEC III.I.2.b III.II.A.1	Wall: a. Untight, lack of waterproof b. Dark colour c. Uneasy to clean d. Window sills are not executed with a slope. e. Not being maintained properly			[]	[]			
4	28TCN 130 3.2.3 3.3.6 3.12.2 91/493/EEC III.I.2.c III.II.A.1	Ceilings: a. Uneasy to clean b. Untight c. Dark color d. Not maintained properly			[]	[]			
5	28TCN 130 3.3.7 3.4.4.2 3.12.2 91/493/EEC III.II.A.1	Doors: a. Undurable materials, lack of waterproof b. Untight c. Uneasy to clean d. Door ribs are not executed with a slope e. Not maintained properly			[]	[]			
	91/493/EEC III.I.2.d	a*. Undurable materials, water absorbent			[]	[]			
6	28TCN 130 3.3.9.1,2,3 3.11.3.2.@ 3.11.4.1.c 28TCN 138 4.1.5	Ventilation and condensation: a. Condensation inside of processing areas b. Bad odour, smoke in processing areas			[]	[]			

	91/493/EEC III.I.2.e									
7	28TCN 130: 3.3.10 3.4.1.5 3.11.3.2.® 3.11.4.1.c 3.12.2 91/493/EEC: III.I.2.f III.II.A.1	Lighting system: a. Insufficient lighting b. Lights not protected, where necessary. c. Uneasy to clean d. Not maintained properly			[]	[]				
8	28TCN 130 3.11.1,2 3.12.2 28TCN 138 4.2.3,4 91/493/EEC III.I.2.g III.II.A.1	Hand washing and disinfecting facilities for workers: a. Insufficient number b. Wash-basin taps are hand-operation c. Liquid-soap unavailable d. Unsuitable drying unit for hands e. Without facilities for disinfecting hands and cleaning dust on protecting clothes of workers. f. Unsuitable chlorinated water basin to wash boots before entering processing areas f. Unsuitable located g. Not maintained properly			[]	[]	[]			
9	28TCN 130: 3.11.5.1,2,3,4 3.11.6; 3.4.4.2; 3.7.1 3.12.4.4 28 TCN 138: 4.6.1.2 91/493/EEC: III.I.2.h	Cleaning and disinfecting facilities for processing premises, equipment, utensils: a. Insufficient facilities for cleaning, unprofessional, not preserved by accurate measures b. Unsuitable cleaning, disinfecting agents c. Inappropriate materials and structure			[]	[]				

10	<p>28TCN 130 : 3.4.1 3.4.2.1 3.4.3,4 3.8 3.12.2 28 TCN 138: 4.2.1 91/493/EEC: III.I.1, 5 III.II.A.1,3</p>	<p><u>Surfaces directly contacting products (cutting-boards, knives, containers, wash-tubs, baskets, surface of working tables...):</u> a. Unsuitable materials b. Structure, joining knots, unsmooth surface, untightness make it uneasy for cleaning c. Misuse, possibility of contamination d Not maintained properly</p>			[] [] [] []	[] [] [] []	[] [] [] []			
11	<p>28TCN 130: 3.4.1,3,4 3.4.4.2 3.8; 3.12.2</p>	<p><u>Surfaces not directly contacting products:</u> a. Made of unsuitable materials, unsuitable structure and uneasy to clean c. Not maintained properly</p>	[] []	[] []						
	<p>91/493/EEC: III.I.5</p>	<p>a*. Unsuitable materials and structure, uneasy to clean</p>		[]	[]					
12	<p>28TCN 130 : 3.4.2.2 3.9.2 91/493/EEC: III.I.6</p>	<p><u>Disposing waste materials (solid):</u> 12.1. Collecting tools of waste materials inside processing areas: a. Uneasy to clean b. Not specialised for use, easily confused with product containers. 12.2. Container for removing waste materials out of the processing areas: a. Untight, without lid b. Not specialized for use c. Unsuitable structure, uneasy to clean 13.3. Waste material containers and premises outside of production areas: a. Untight, uneasy to clean b. Not specialised for use</p>	[] [] []	[] [] [] []						
13	<p>28TCN 130 3.3.4.1.b 3.3.4.2,3,4,5 3.12.2</p>	<p><u>Drainage of waste water:</u> a. Insufficient capability of drainage. b. Without soakage pits or soakage pits with improper model.</p>		[] []	[] []	[] []	[] []			

	91/493/EEC III. I. 8 III.II.A.1	c. Absorbent, unsmooth, unflat. d. Drainage from processing areas is connected with drainage from toilets. e. Not maintained properly.			[]	[]	[]			
14	28TCN 130: 2.11 3.1.3.1 3.5 3.7 91/493/EEC III.I.7 80/778/EEC	Water supply system: 14.1. Water for processing: a . Without diagram of the water distribution or non-up-dated b . Unsafe c . Insufficient quantity for use 14.2. Control of water quality a. Without plan or implementation not complying with plan b. improper implementation			[]	[]	[]			
	91/493/EEC III.I.7 80/778/EEC	14.1.b*. Unsafe 14.2.a*. Without plan or Implementation not complying with plan 14.2.b*. improper implementation			[]	[]	[]			
15	28TCN 130: 3.4.4.1 3.4.6 3.6	Ice: a. Unsafe water sources b. produced, handled, stored, transported not in a sanitary manner					[] []			
15	91/493/EEC: III.I.7 80/778/EEC	c. Improper control of ice quality			[]	[]				
16	28TCN 130: 3.8	Compressed air: a. Unsafety b. Unsuitable air supply source c. Improperly maintained			[] []	[] []	[]			

17	<p>28TCN 130: 3.2.3 3.3.7.1.2,5 3.12.3.1 3.12.1.6</p> <p>91/493/EEC: III.I.4 III.II.A.2</p>	<p><u>Harmful animal and pest prevention and killing system:</u> 17.1. Prevention: a. Presence of shelters for pests and harmful animals inside processing areas b. Presence of shelters of pests and harmful animals outside processing areas c. Unavailable measures to prevent pests and harmful animals 17.2. Killing: a. Without control plan or unsuitable plan b. Presence of pests and harmful animals</p>		[]	[]	[]	[]			
18	<p>28TCN 130: 3.11.4 3.12.2</p> <p>91/493/EEC: III.I.9 III.II.A.1</p>	<p><u>Personal hygiene areas:</u> a. Insufficient quantity b. Unsuitable facilities and layouts (arrangement of rooms, equipments, drainage, toilet-paper...) c. Improperly located d. Improperly maintained</p>	[]	[]	[]	[]	[]			
19	<p>28TCN 130 3.11.3 3.13.2</p> <p>28 TCN 138 4.6.2.1,2,3</p> <p>91/493/EEC III.II.B.1.a</p>	<p><u>Working uniforms:</u> 19.1. Supplying working uniforms: a. Insufficient number or types b. Unsuitable system for laundry c. Unclean uniforms 19.2. Changing-rooms: a. Without changing rooms b. Unsuitable or without separated changing-rooms from processing areas of ready-to-eat fishery products. c. Without separated changing-rooms in areas having different levels of risks d. Improperly located e. Improperly maintained</p>			[]	[]	[]	[]	[]	[]

20	28TCN 130 3.12.1.1,2 5.2,3 5.4.1 5.5.2 28TCN 138 4.4 91/493/EEC IV.II. 1.a,b	Freezing and glazing system: a. Unsuitable pre-freezing methods b. Freezing equipment with insufficient capacity to lower temperature in accordance with regulations c. Ready-to-eat fishery products not yet tightly packaged are frozen with other types of products at the same time by using the same equipment d. Unsuitable equipment for removing blocks from trays and glazing			[]	[]				
	91/493/EEC IV.II. 1.a,b	a*. Unsuitable pre-freezing methods b*. insufficient freezing time d*. Unsuitable equipment for removing blocks from trays and glazing			[]	[]				
21	28TCN 130 : 3.4.5 5.4.2 5.5 7.1 7.3.2 28TCN138 4.5.2,3 91/493/EEC IV.II. 1.b IV.II.3	Cold store and transports: 21.1. Cold store: a. Not maintained at appropriate temperature b. Without temperature recording device c. Without temperature diagram or in improper way d. Thermometer-sensor is installed in improper place e. Inadequate cleaning and storage methods 21.2. Refrigeration means for transportation are not maintained at suitable temperatures			[]	[]				
	91/493/EEC IV.II. 1.b IV.II.3	21.1.b*. Without automatically recording thermometer				[]				
22	28TCN 130: 3.1.3.2	Reserved electric source: Not available or not enough			[]	[]				
23	28TCN 130 5.4; 6.2 28 TCN 138 4.5.1, 4 91/493/EEC VI, VII Circular No.	Packaging, labeling: 13.1. Packaging: a . separated packaging area not available b. Unsuitable packaging materials 13.2. Labeling: Carried out under unhygienic conditions 9.2. Labeling a . Not enough information			[]	[]				
					[]	[]				

	03/2000/ TT-BTS	b. Improper labeling				[]	[]			
24	28TCN 130 3.4.8;3.12.1.2 91/493/EEC VI.4	<u>Packaging materials store:</u> a. Without separated store for packaging materials b. Improper methods of storing and transporting				[]	[]			
25	28TCN 130 3.11.5.5 3.12.3.2 3.12.4.4 28TCN 156 91/493/EEC III.II.A.2	<u>Chemicals and additives:</u> 25.1. Chemicals and additives: a. Not authorized or used over acceptable limit, unclear origin. b. Improperly used and stored 25.2. Chemicals for cleansing, sterilizing and killing pests a. Not authorized or unclear origin b. Improperly using or storing				[]	[]			
26	28TCN 130 3.1.1; 3.1.3.3 3.2.1; 3.3.2 91/493/EEC III.II	<u>Surrounding environment:</u> a. Surround environment affecting the plant b. Surround environment affecting processing areas		[]		[]				
27	28TCN 130 6; 7.1.3,5 7.2; 7.3.1,3 91/493/EEC II	<u>Supply system of raw materials:</u> 27.1.Records of supplying raw materials: a. Records of raw material suppliers not available b. Insufficient, unreliable 27.2. Unloading, landing, transportation and storage in unhygienic conditions				[]	[]			
	91/493/EEC II	27.1.a*. records of controlling hygiene and safety production conditions of raw material suppliers not available 27.1.b*. Insufficient, unreliable				[]	[]			
28	28TCN 129 5.1,2,3 5.10 5.12 28TCN 130 3.10	<u>Organization structure and assuring conditions of quality control system:</u> 28.1. Organization structure: a. insufficiently professional and capable staff b. Insufficient given authority 28.2. Assuring conditions:				[]	[]			

	91/493/EEC Article 6 (1)	a. Insufficient legal basis for implementing quality control b. Insufficient necessary equipment to implement quality control suitably and sufficiently c. Staff involving in quality control is not regularly updated with knowledge of quality control.			[] [] []	[] [] []				
29	28TCN 130 28TCN 129 28 TCN 138 28TCN 156 91/493/EEC 94/356/EEC	Quality management program: a. Not available or insufficient b. not complying with regulations and practices			[] []	[] []				
30	28 TCN 129 28TCN 130 28TCN 138 28TCN 156 91/493/EEC Article 6(1) 94/356/EEC	Implementation of GMP, SSOP and HACCP: a. Arrangement and management of production generate potential risks of contamination to products b. Without control or inadequate over temperature of semi-products and time of production. c. Operations of workers may cause unsafety of products d. Inadequately cleaning workshops and equipment e. Not maintaining general hygiene conditions f. Inadequately implementing personal hygiene g. Not monitoring health of workers or not in accordance with regulations h. Not control CCP or inadequately i. Inadequately and not timely implementing corrective actions when acceptable limits are out of control			[] [] [] [] [] [] [] []	[] [] [] [] [] [] [] []				

31	28 TCN 129 28TCN 130 28TCN 138 28TCN 156 91/493/EEC article 6 (1) 94/356/EEC	<u>Verification:</u> a. Without implementation or inadequately of the verification of control records b. Without implementation or inadequately of the verification of sampling plan c. Without implementation or inadequately of the verification of calibration monitoring equipment d. Without implementation of verification plan and adjustment of the program when necessary			[]	[]				
32	28TCN 129 3 4.8 94/356/EEC article 6 III	<u>Quality control records:</u> a. Unavailable or inadequate b. Unreliable c. Uneasy to access d. Time of keeping documents is not in accordance with regulations			[]	[]	[]			
Total : 32 groups of criteria			IN ACCORDANCE WITH VIETNAMESE REQUIREMENTS							
			IN ACCORDANCE WITH EU REQUIREMENTS							

.....(Place),(date).....(month).....(year)
REPRESENTATIVE OF INSPECTED ESTABLISHMENT
 (Sign and seal)

.....(Place),(date).....(month).....(year)
HEAD OF INSPECTION TEAM
 (Sign)

