A CASE STUDY OF INDONESIAN FROZEN SHRIMPS EXPORT DETENTION BY FDA (FOOD AND DRUG ADMINISTRATION) IN 1998

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Abstract

Export detention cases of Indonesian fishery products to the United State in 1995 caused a financial lost up to $US 17.580.738. Frozen shrimps, one of the top export comodities also experienced a detention case by FDA. Up until now frozen shrimps that are exported from Indonesia to the United State have been block listed by the goverrnent of the United State and have undergone an automatically detention and inspection procedure. The objective of this research was to determine the major problems of Indonesian frozen shrimps export detention cases by the FDA in 1998, and also determine the main factors that caused these problems in order to proceed with quality correction action. The results showed that the major problems of export detention cases of Indonesian frozen shrimps was Salmonella. The main factors causing Salmonella were quality of fresh shrimps, a not well design and application of HACCP system in the frozen shrimp industries, time and sensitivity of Salmonella assay methods. Quality correction actions can be applied at shrimp farms, frozen shrimps industries and the goverment.

INTRODUCTION

Global economy has pressed all countries to create product to compete each other, not particularly for Indonesian. One dominant commodity in export and giving high contribution of foreign exchange is shrimps. Shrimps exported to America in 1997 reaches to US $ 160.133.000 (Raharjo, 1998).

However, the export is often faced prohibition by FDA (Food and Drug Administration). All shrimp's exported from Indonesia has been included in "block list" meaning that it has been included in automatically detention and inspection. Financial loss is resulted from export prohibition towards Indonesian fishing product by FDA in 1995 increases to US $ 17.580.738 (Syarief, 1996). Export prohibition affects to industrial image of Indonesian shrimps product in worldwide market. It should be prevented.

Study is designated to determine main problem of prohibition towards Indonesian frozen shrimps exported to America by FDA in year of 1998 and main considered factors. Results of study are expected to measure the quality.

METHODOLOGY

Data Collection

Data is comprised to primary and secondary data. Primary data concerns on main factors creating detention towards Indonesian frozen shrimps to America are obtained by direct observation and interviews with technology experts and practitioner. Secondary data focusing on amount and the effect of export prohibition are obtained by accessing Internet data provided by FDA.

Main Problem Determination

It is determined by pareto analysis from interview with related practitioner.

Problem Analysis

Causing-problem analysis has been conducted by using Ishikawa diagram to determine factors of problem.

Problem Verification

It is designated to determine main factors caused the main problems. It is based on field survey on frozen shrimps industry, interview

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with technological expert and related practitioners supported by checklist, and literature study. Results of problem verification determine dominant causing-problems.

Quality Improvement

Quality improvement is determined by identifying dominant causing-problems from verification result, literature study and consults with technological experts.

RESULT AND CONSIDERATION

Indonesian Frozen Shrimps Export Detention By Fda

Detention on Indonesian Frozen Shrimps export by FDA has reached US $ 17.580.738 in 1995 (Syarief, 1996). Table I consists of data obtaining from Internet on detention case between 1997 and 1998.

Main Problem Determination

Table 1. Indonesian Frozen Shrimps Detention by American

Year Periods	Detention Numbers	Detention	
		Sharing numbers	Cause
1997	39	30	Salmonella and decomposition
		5	Salmonella
		3	Decomposition and filthy
		1	Decomposition
1998	53	20	Filthy, Salmonella, Foreign OB
		12	Filthy, Salmonella
		9	Salmonella
		7	Filthy, Salmonella, Unsanitary
		1	Misteria
		1	Soaked wet, Filthy, Salmonella
		1	Soaked wet
		1	Container
		1	Unsanitary

Sumber : http://www.fda.gov

Graphic I indicate relationship between frequency and type of detention in 1998. This graphic plus pareto analysis determines that main problems of export detention by FDA in 1998 is the existence of *Salmonella*, *Filthy*, and *Foreign OB*. Recent research is focused on Salmonella case because it is often emerged.

Causing Problem Analysis

Since causal-effect diagram (Ishikawa diagram) is used, factors affecting Salmonella case in frozen shrimps comprises to:

a. Methods, include:
   - Transportation (temperatures, humidity, tools, and purity)
   - Salmonella inspection (timing, sensitivity, and methods)
   - Cleaning process (methods, timing, tools, and temperatures)
   - Washing process (washing water temperatures, chlorine concentrates)
   - Freezing process (temperatures, timing, methods)
   - Glazing (water quality, temperatures)
   - Shrimps arrangement in patch (contamination, temperatures)

b. Raw Materials, include:

- Shrimps (Salmonella contents, embankment products, post cropping management, acceptance temperatures)
- Water (quality, temperatures)
- Ice (size, quality)
- Disinfectant (concentrates, effective)

c. Labors, include:
- Training (quality, hygienic personnel)
- Motivation and patience (hygienic personnel, carefulness)
- Education

d. Equipments, include:
- Temperature controller (controlling system, calibration)
- Patch (purity, disinfectant)
- Sanitation tools and the patch
- Maintenance

e. Management, include:
- Support (sanitation and hygienic)
- Quality management system
- Quality policy
- Work procedure (cross contamination)
- HACCP System (engineering, communication)

f. Environment, include:
- Building construction (environment pests)
- Waste management
- Purity
- Maintenance

Causal-effect diagram for Salmonella case in frozen shrimps is indicated in Figure 1.

Causing Problem Verification

Main factors of Salmonella case in frozen shrimps is as follows:

1. Materials
   a. Shrimps Quality
      Interview with technological experts results in proposition that if Salmonella have contaminated shrimps as raw materials, the bacteria will grown and develop during preparation process, and it can contaminate other shrimps without Salmonella. Therefore, end product is Salmonella contaminated. Quality control should be implemented during shrimps production, such that contamination will be reduced.
      Result of interview shows that Salmonella contamination in shrimps as raw material can be produced from embankment contained by dirt or feces during shrimps preparation or frozen shrimps management. Salmonella contamination in shrimps should be from water polluted by human or animal feces.
      River contents many dirt or feces, because river is still functioned as end disposal drainage or as bath-place to animal. Instead of water contamination, land polluted by animal dirt or feces (from guardian dogs) is scraped and gone along with rainfalls to enter the embankment. Land contamination is also founded when workers are splashing into embankment in cropping process (result of interview).
      Shrimps quality should be controlled such that contamination and Salmonella case (in frozen shrimps) will be minimized. Department of Production and Purchasing should responsible for it.
      Ehry (1998) proposes that company, those having detention case, tends to accept all raw materials and without ever rejecting it. They should make strict policy in accepting raw materials and give rejection or warning statements to suppliers with Salmonella contaminated.
   b. Water
      Water is a source of contamination Salmonella. Result of survey indicates that water temperature used in processing is sometimes reached to 5^0C, even to 8^0C. The higher temperature than 5^0C give higher opportunity of Salmonella growth, because Salmonella growth temperature interval is between 5^0C – 47^0C (Defigueiredo and Splitstoesser, 1976). Water quality should be in equal standard with drinking water and has requirements of water quality used in food industry. It should be passed water purity phases (sediment cleaning, coagulation, and filtration).
2. Methods

a. Washing
   Based on HACCP requirements, water temperature of frozen shrimps should be less than 5^0C. It is also required in washing water. Survey indicates that water temperature used in preparation sometimes reaches more than 5^0C, even values to 8^0C. This condition supports Salmonella growth.
   Washing water replacement is not adjusted to HACCP standard, that is, it should be replaced after 10 times of washing. Water is replaced based on visual observation (when it seems dirty).
b. Salmonella Test
   Qualitative test is used, that is, to determine whether Salmonella case is negative rather than positive. Partnership research between *Food and Nutrition Center* of IPB and *Food Endurance and Safety Development Project* of Food and Horticulture Department (1998) has been conducted. It is reported that the export detention for Salmonella case is caused by lack of sanitation during production and processing. Salmonella test in export industry is still less sensitive than in import industry.
   The possible factor of minimal sensitivity is analysts factor. Analysts doing test on Salmonella should high skilled and thoroughness (reliability). Minimal errors or misinterpretation should be concerned.
   BAM method in Salmonella testing requires long terms (4 – 5 days). Shrimps export without Salmonella test status is often observed. It is anything to do with believes that testing method requires long period, but on the other hand, export order should be handling (sudden export). Therefore, it is not surprising that positive Salmonella case may be founded by importing countries (FDA).
c. Shrimps Arrangement in Patch
   Arrangement phase in patch before freezing is a phase often followed by Salmonella case. The case is founded for contact time between shrimps and labors are too long. There is very long contact between shrimps with external temperature. Therefore, Salmonella still remains resistant.

3. Labors
   a. Training
      Ehry (1998) reports that company provides the employees with less specific training. Development is only focused on the field, and meetings are arranged after problems are occurred. Training is not based on the demand analysis. Lack of training on hygienic personnel will cause to the Salmonella case in frozen shrimps.
   b. Motivation and patience
      Less motivation and patience from hygienic personnel affects shrimps quality. It can result in contaminated shrimps. The features are common in processing area. They are supported by less utility of production facility (glove, mask), less awareness to wash hand or to use soap after toilet in processing area. Carefulness is still less, that is, shown by high frequency of falling shrimps to the ground. It supports Salmonella case.
      Motivation and realization development on hygienic matters can be done by good example from management, and giving statements about the danger of Salmonella case. Direct observation can be implemented, such as examine labor hands on the cup, compare the washed and unwashed hands, and announce the results to all employees. Giving incentives to employees who achieved hygienic requirements, and giving penalties to whom disobey, are other solution to develop motivation and realization.
4. Management
   a. Management Supports
      Management supports to hygienic and sanitation matters remains less. Training about hygienic personnel principal is rarely programmed. Training is not along with need assessment rather than not well scheduled. Development should be in field and meetings are only held after problems.

Ensuring washed hands after toilet in processing area is less realized. Employee without processing facility (glove, mask) shows the control weakness on management sides. Healthy examination is not periodically implicated. Therefore, it is difficult to detect whether employees with small ill do not absent in their work.

b. HACCP System
HACCP is a management system to guarantee food safety and quality. Recent requirements of HACCP for exported fish and fishing product to US have been effective since December 18 1997. It should be main consideration. Imperfect engineering and implication of HACCP system is important factor of Salmonella case. However, many companies have possessed quality management guidelines with HACCP concepts. The problem is that the implication is far from perfect.
Many employees do not common with HACCP system (50 % of them understand it). Less communication between management and all employees remains clear. Therefore, product quality will be out of control. QA department and production unit must communicate HACCP system to all employees and control the implication.
HACCP system engineering, through CCP phase, in certain company should be reviewed. Salmonella case in frozen shrimps is resulted in the phase instead of CCP.

c. Working Procedure
Working procedure-giving opportunity to cross contamination should be shortened. Movement orders affect the contamination, particularly employee's movement in processing area, both for original shrimps and frozen shrimps. Employees worked for frozen shrimps production are also worked for raw shrimps processing. Therefore, cross contamination is possible.

It is summarized that dominant causing factors of Salmonella case in frozen shrimps is:

a. Fresh shrimps quality
b. System engineering and implicating of HACCP
c. Salmonella testing method timing and sensitivity

Quality Improvement Effort Determination

With the identification of dominant causing problem from problem verification of Indonesian frozen shrimps export detention by FDA in 1998, and it is supported by results of interview with technological experts and practitioners, reviews of literature, quality improvement behavior is determined, such as follows:

1. Raw Materials
Product quality from preparation process is affected by raw materials quality. Shrimps handling in embankment can be implemented by partnership between interested industries and embankment farmers. Industrial sides can implicate short course, observation, and training for farmers to obtain controlled quality.
Raw materials determination can be done by water treatment such as sedimentation, chemical, and bio-filter. It is also conducted during raw materials acceptance. Strict policy has to be decided whether company should accept or reject supplier with positive Salmonella case.
2. Management (HACCP system)
In general, frozen shrimps industry has not provided with correct HACCP system. Appropriate HACCP application will observe hygienic and sanitation process to control product quality. Common problem in HACCP implication is that employees are not common with it. Its solution is by communicating the system to all employees through training and controlled implication.
HACCP engineering through CCP phase in frozen shrimps industry should be reviewed and referred to control the process and product quality. HACCP sheet for frozen shrimps is shown in Table 2. During HACCP implication, controlling is not only provided in CCP phase, but also in CP, but less strict than CCP.

Table 2. HACCP Sheets on Frozen Shrimps Processing

Process	Potential Danger	CCP	Prevention, Observation, and Control
Freezing	Microbial growth (Salmonella)	- Freezing temperature and timing - Freezing smoothness	- Freezing temperature is arranged from -32^0C to -40^0C for 1,5 – 2 hours by quick freezing. - Temperature determining tools calibration - Skilled operators
Frozen storage	Microbial growth (Salmonella)	- Storage temperature	- Frozen storage temperature should be at -18^0C or less. - Temperature determining tools calibration. - Skilled operators
Transportation	Microbial growth (Salmonella)	- Transportation temperature	- Transportation temperature should be at -18^0C or less. - Temperature determining tools calibration.
Distribution	Microbial growth (Salmonella)	- Product temperature during distribution	- Transportation temperature should be at -18^0C or less.
Salmonella test	Testing errors and misinterpretation	- Careful and skilled reliable) analysts	- Training to analysts - GLP (Good Laboratory Practices) - Reliability testing

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3. Methods (Salmonella testing)
   Skill and reliability from analysts give large influence to methods sensitivity. Minimal errors should be obtained. Controlling actions in these matters are:
   a. Provide training to analysts
   b. Provide reliability test to analysts
   c. Well implicated GLP (Good Laboratory Practices)
   d. Determine Salmonella testing phases as CCP.

Shrimps delivery without known Salmonella status is often caused by the use of quite classic testing methods during short order handling intervals. Management should produce strict policy to decide that shrimps delivered should be tested and known the status. Some actions required by concerning parties with export detention by FDA for Salmonella case is shown in Table 3.

CONCLUSIONS

Financial loss caused by Indonesian fish production export detention by FDA in 1995 has reached to US $ 17.850.738. Main problem of export detention to America is Salmonella case. Main factors causing Salmonella case in frozen shrimps is as follows:

a. Materials, comprise to shrimps and water quality
b. Methods, comprise to washing temperature, timing and sensitivity of Salmonella test, and shrimps arrangement in patch.
c. Labors, comprise to less motivation and awareness to hygienic and sanitation, and less training to employees on it.
d. Management, comprise to less support from management, imperfect engineering and implication of HACCP, and working procedure possible to cross contamination.

Some main factors above determines dominant causing factors, such as:

a. Fresh shrimps quality

Table 3. Controlling actions to reduce Salmonella case

Efforts	Related Party/Parties
1. Partnership between industry and farmers	Company, farmers
2. Develop course and plan towards embankment farmers concerning on shrimps production and hygienic and sanitation principals.	General Directorate of Fishery
3. Provide strict control to raw material quality	Company
4. Develop course and plan towards entrepreneurs concerning on HACCP system implication as required by FDA.	General Directorate of Fishery and Export Directorate from Department of Trade and Industry
5. Provide correct engineering, communication, and implication of HACCP system.	Company
6. Develop sensitivity test of Salmonella testing method and GLP implication (Good Laboratory Practices)	Company
7. Provide training about quality based on need assessment.	Company
8. Assess the quality development and problems in frozen shrimps export related with automatic detention	Export Directorate from Department of Trade and Industry, GAPKINDO (Unification of Indonesian fish entrepreneur)

b. Imperfect engineering and implication of HACCP
c. Timing and sensitivity of Salmonella test

Quality improvement that can be determined is as follows:

a. Partnership between entrepreneurs and farmers.
b. Develop course and plan towards embankment farmers concerning on shrimps production and hygienic and sanitation principals.
c. Provide strict control to raw material quality.
d. Develop course and plan towards entrepreneurs concerning on HACCP system implication as required by FDA.
e. Provide correct engineering, communication, and implication of HACCP system.
f. Develop sensitivity test of Salmonella testing method and GLP implication (Good Laboratory Practices)
g. Provide training about quality based on need assessment.
h. Assess the quality development and problems in frozen shrimps export related with automatic detention.

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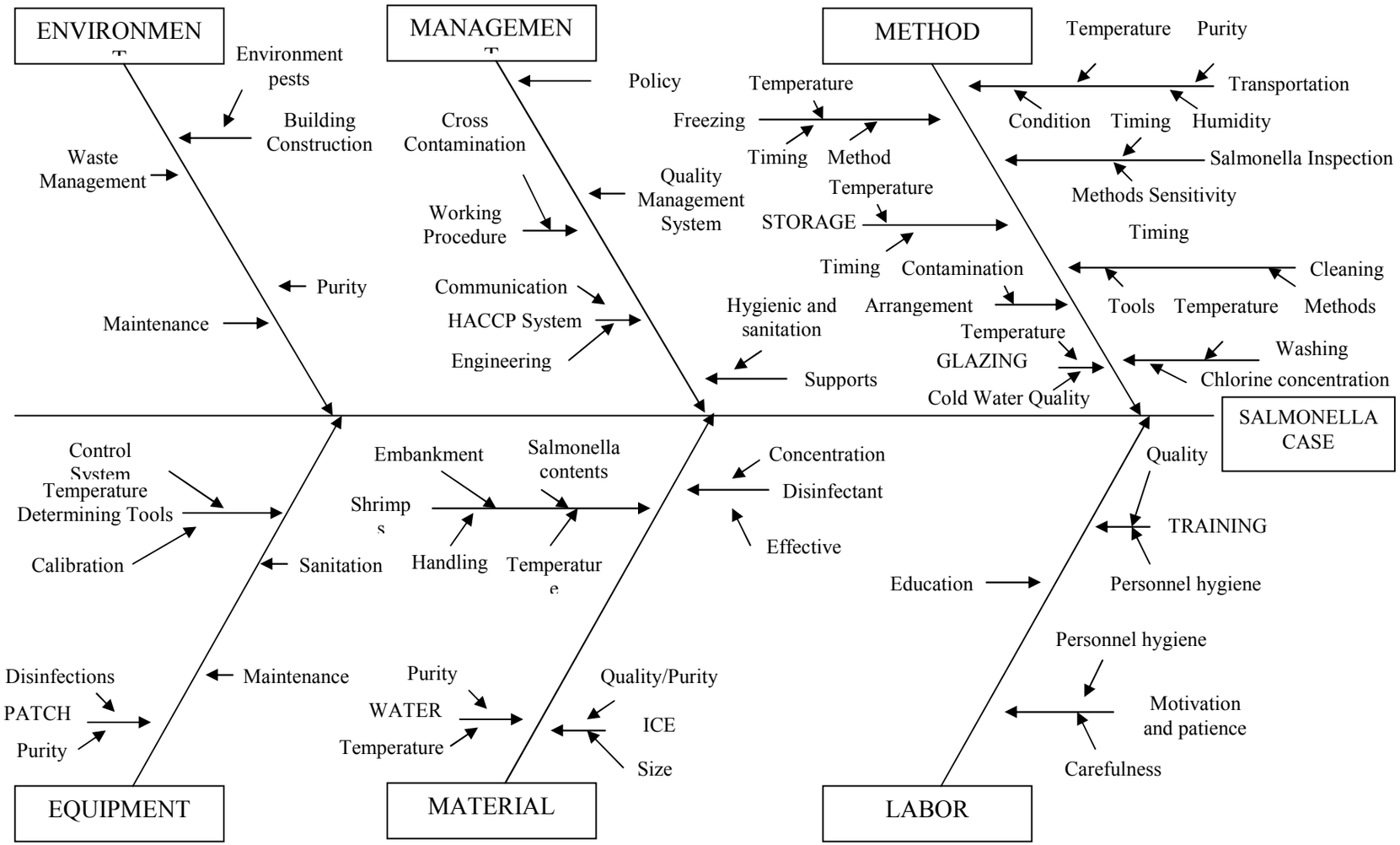
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