

VIETNAM

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1. Introduction

The control of residues of harmful substances, especially pesticides, is important because these residues affect consumers' health seriously, affecting the respiration system, central nerve system and may result in death. The more important fact is that there is no way to eliminate these substances in the processing stage when fish products are already contaminated.

The increasing import of fish and fish products into high-income countries requires strict standards on hygiene and safety, resulting in specific requirements on chemical residues in fish and fish products being set up.

For this reason, pesticide residues survey and studies activities organized by SEAFDEC and funded by JTF II are significant as the activities provide an overview of residue levels of pesticides in fish and fish products in South-East Asia. Member countries would then determine appropriate policies to control quality and safety of fish and fish products for meeting importing countries' requirements and protecting domestic consumers' health.

In Vietnam, as the national competent authority responsible for controlling quality, hygiene and safety of fish and fish product since 1997, the National Agro-Forestry and Fisheries Quality Assurance Department-NAFIQAD (known as the National Fisheries Quality Assurance and Veterinary Directorate- NAFIQAVED before February 23, 2008) has been carrying out the Monitoring Program for certain harmful substances and residues present in aquaculture animals. NAFIQAD also actively participated in the "Research and Analysis of Chemical Residues and Contamination in Fish and Fish Products" as well as other activities organized by SEAFDEC.

2. Objectives And Goals

Surveys of pesticides are carried out to provide information on the level of residues of contaminants in farmed fish and fish products. The data obtained was deposited into the database of the Fish and Fish Products Safety Information Network. The network's website: www.fishsafetyinfo.com contains general information on fishery hygiene and safety in SEAFDEC's member countries.

3. Survey Methodologies

a. Sampling Method, Location, Species, Number of Samples and Sampling Size

- NAFIQAD branches took samples and analyzed samples as required by the activity.
- Activities carried out by NAFIQAD including the following:
 - a) Activities using SEAFDEC's budget;
 - b) Activities using budget from the Monitoring Program for certain harmful substances and residues in aquaculture animals and certification activities for exported fishery consignments.
- NAFIQAD has signed contracts with its Branches for the implementation of activities, and then is responsible for data analysis and treatment and making report.
- NAFIQAD branches carry out the procedures of sampling, sample preservation, dispatch of samples to laboratories and analysis, in compliance with the Residues Monitoring Program Manual and Quality Manual of NAFIQAD.
- In 2007, the targetted samples were changed. Wild fish and processed products, not aquaculture fish, were sampled.

- Species sampled in 2006, 2007 and 2008:

2006	2007	2008
<ul style="list-style-type: none"> • Black Tiger Shrimps: <i>Penaeus monodon</i> • Clam: <i>Meretrix lyrata</i> • Basa Cat Fish: <i>Pangasius bocourti</i> • Tra Cat Fish: <i>Pangasius hypophthalmus</i> • Tilapia: <i>Oreochromis</i> spp. 	<ul style="list-style-type: none"> • Black Tiger Shrimps: <i>Penaeus monodon</i> (semi and final products were taken from processing plant and the market) • Clam: <i>Meretrix lyrata</i> • Fillet Cat Fish: <i>Pangasius hypophthalmus</i> (semi and final products were taken from processing plant and the market) 	<ul style="list-style-type: none"> • Black Tiger Shrimps: <i>Penaeus monodon</i> (semi and final products were taken from processing plant and the market) • Clam: <i>Meretrix lyrata</i> • Fillet Cat Fish: <i>Pangasius hypophthalmus</i> (semi and final products were taken from processing plant and the market)

b. Method of Analysis

Method: AOAC 983.21.1995

Equipment: GC-ECD Agilent

Testing method has been accredited with ISO 17025 by BoA – VILAS

c. Limit of Detection Limit of Quantification

Limit of Detection (LOD):

- Aldrin, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene, Lindane: 2 ppb
- Chlordane: 5 ppb
- DDT: 10 ppb

d. National Regulatory Limits

MRLs required:

- Vietnam
Aldrin: 0.2 mg/kg, Dieldrin: 0.2 mg/kg, Endrin: 0.05 mg/kg, Lindane: 2 mg/kg, DDT: 1 mg/kg, Heptachlor: 0.2 mg/kg, Hexachlorobenzene: 0.2 mg/kg, Chlordane: 0.05 mg/kg.
- EU
Aldrin: 200 ppb, Dieldrin: 200 ppb, Endrin: 50 ppb, Heptachlor: 200 ppb, Lindane: 1000 ppb, DDT: 1000 ppb
- USA
Aldrin and Dieldrin: 0.3 ppm, Heptachlor: 0.3 ppm, DDT: 5 ppm

4. Results And Discussion

a. Participation in Inter-laboratory Proficiency Testing and Results

Year of participation	Program Name	Analyte Tested	Remarks
2005	Fish meal/ FAPAS	Organo-chlorinated pesticides	Passed

b. Survey Results and Discussion

No.	Sample Name	SEAFDEC's budget			Vietnam's budget			Total		
		No. of samples	Analysis results (ppb)	No. of samples exceeding MRL	No. of samples	Analysis results (ppb)	No. of samples exceeding MRL	No. of samples	Analysis results (ppb)	No. of samples exceeding MRL
2006										
1	Black Tiger Shrimp	10	ND	0	41	ND	0	51	ND	0
2	Clam	8	ND	0	43	ND	0	51	ND	0
3	Tra/Basa Cat Fish	16	ND	0	-	-	-	16	ND	0
4	Tilapia	-	-	-	3	ND	0	3	ND	0
2007										
1	Black Tiger Shrimp	5	ND	0	407	ND	0	412	ND	0
2	Clam	15	ND	0	45	ND	0	60	ND	0
3	Tra/Basa Cat Fish	20	ND	0	294	ND	0	314	ND	0
4	Tilapia	-	-	-	54	ND	0	54	ND	0
5	Others	-	-	-	56	ND	0	56	ND	0
2008										
1	Black Tiger Shrimp	5	ND	0	-	-	-	5	ND	0
2	Clam	5	ND	0	-	-	-	5	ND	0
3	Tra/Basa Cat Fish	5	ND	0	-	-	-	5	ND	0

Note: The average recovery for Black Tiger Shrimp, Clam, and Tra/Basa catfish analysed in 2008 was 80%, 85% and 78% respectively.

ND: Not detected

Contamination levels of organochlorinated substances in fish reflect how the use of pesticides in agriculture affects the environment and aquaculture fish. Analysis results showed that there was no pesticide residues detected in tested samples. In addition, from 1999 to 2007, there was no sample detected to have exceeded MRLs for pesticides in Vietnam. This signified that pesticides used in agriculture have not much impact on Vietnam aquaculture / capture environment.

5. Problems and Challenges Encountered

Due to limited budget for each activity, collected data may not be enough to reflect the real impact of chemical contaminants and antibiotics residues on aquaculture fish.

6. Recommendations and Suggestions for Future Follow up Action

It would be highly appreciated if the Project could focus on updating and training on new analytical methods, specifically multi-residues analysis method, in order to improve the testing capabilities on fish quality and safety in Southeast Asia.