VIETNAM

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1. Introduction

The increase in export of fish and fish products to high-income countries requires strict standards on hygiene and safety. Specific requirements on chemical residues in fish and fish products are consequently set up.

For this reason, surveys and studies activities organized by SEAFDEC and funded by JTF IV were significant, as they contribute to providing an overview on residue levels of chemicals and contaminants in aquaculture fish in South-East Asia. , Member countries would then determine appropriate policies to ensure quality and safety of fish and fish products, meet importing countries' requirements and protect the health of domestic consumers.

In Vietnam, as the competent national authority responsible for ensuring quality, hygiene and safety of fish and fish products since 1997, the National Fisheries Quality Assurance and Veterinary Directorate – NAFIQAVED (now renamed as the National Agriculture, Forestry and Fisheries Quality Assurance Department-NAFIQAD) has been carrying out the Monitoring Program for certain harmful substances and residues in aquaculture animals. NAFIQAD had also actively participated in the survey titled "Research and Analysis of Chemical Residues and Contaminants in fish and fish products" as well as other activities organized by SEAFDEC.

2. Objectives And Goals

Surveys of antibiotic residues are carried out to provide information on the level of histamine present in 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 led to implement all activities in 2006 to 2008.
- NAFIQAD branches took samples and analyzed samples as required by the activity.
- Activities carried out by NAFIQAD including the following:
  (i) Activities using SEAFDEC's budget;
  (ii) 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.
- Raw materials of the following species were collected:
  Frozen Black Tiger Shrimps (*Penaeus monodon*)
  Crabs (*Scylla serrata*)
  Bigeye Tuna (*Thunnus albacares*)
  Octopus (*Octopus* spp.)
  Squid (*Loligo edulis*)
  Cuttlefish (*Sepia* spp.)

- The samples were collected from Northern to Southern of Vietnam. Fresh chilled samples were collected from aquaculture farms and from the sea. Frozen samples were collected from processing establishments.

b. Method of Analysis

Screening method for Chloramphenicol (CAP) and Nitrofurans (NF)
Method: Guidance of R-Biopharm using ELISA
Testing method was accredited with ISO 17025 by BoA – VILAS.

Confirmatory method for CAP and NFs for positive samples in NAFIQAVED Branch 4
Method: in-house method 5.2-CL4/ST
Equipment: Tandem LC/MS/MS
Testing method was accredited with ISO 17025 by BoA – VILAS.

Malachite Green (MG) and Leuco-Malachite Green (LMG) analysis
Method: in-house method
Equipment: LC/MS/MS
Testing method was accredited with ISO 17025 by BoA – VILAS.

c. Limit of Detection and Limit of Quantification

- Screening method for CAP, NFs:

Limit of detection (LOD) for CAP: 0.2 ppb

LOD for AOZ and AMOZ: 0.5 ppb

- Confirmatory method for CAP, NFs in case of positive samples in NAFIQAVED Branch 4:

LOD for CAP: 0.1 ppb

LOD for AOZ and AMOZ: 0.5 ppb

- MG/LMG analysis

LOD for MG and LMG: 0.5 ppb

d. National Regulatory Limits

Are not allowed by Vietnam, EU, USA, Japan and Korea

4. Results And Discussion

a. Participation in Inter-laboratory Proficiency Testing and Results

Year of participation	Program Name	Analyte Tested	Remarks
2006	FAPAS/ 2006/ Prawn	AOZ, AMOZ	Passed
2006	FAPAS/ 2006/ Fish	MG	Passed
2007	FAPAS/ 2007/ Fish	MG	Passed

b. Survey Results and Discussion

SEAFDEC's budget

Year of analysis & Sampling location	Analyte	Fish sample analysed		No. of samples analysed	Min. value of results (ppb) – wet weight basis	Max. value of result (ppb) – wet weight basis	Average value of result (ppb) – wet weight basis	Average Recovery (%)
		Common name	Scientific name					
2006	CAP	Crabs	*Portunus pelagicus*	8	ND	ND	ND	70%
		Black Tiger Shrimps	*Penaeus monodon*	8	ND	ND	ND	70%
		Frozen Black Tiger Shrimps	*Penaeus monodon*	8	ND	ND	ND	70%
		Frozen Boiled Black Tiger Shrimps	*Penaeus monodon*	8	ND	ND	ND	70%
	Nitrofuran (AOZ)	Crabs	*Portunus pelagicus*	8	ND	ND	ND	80%
		Marine fish	*Penaeus monodon*	8	ND	ND	ND	80%
		Squid/Octopus	*Sepia* spp./ *Octopus* spp.	8	ND	ND	ND	80%
		Black Tiger Shrimps	*Penaeus monodon*	8	ND	ND	ND	80%
	Nitrofuran (AMOZ)	Crabs	*Portunus pelagicus*	8	ND	ND	ND	75%
		Black Tiger Shrimps	*Penaeus monodon*	8	ND	ND	ND	75%
		Frozen Black Tiger Shrimps	*Penaeus monodon*	8	ND	ND	ND	75%
		Frozen Boiled Black Tiger Shrimps	*Penaeus monodon*	8	ND	ND	ND	75%
2007	CAP	Crabs	*Portunus pelagicus*	10	ND	ND	ND	70%
		Marine fish	/	10	ND	ND	ND	70%
		Squid/Octopus	*Sepia* spp./ *Octopus* spp.	10	ND	ND	ND	70%
		Black Tiger Shrimps	*Penaeus monodon*	10	ND	ND	ND	70%
	Nitrofuran (AOZ, AMOZ)	Crabs	*Portunus pelagicus*	10	ND	ND	ND	80%
		Marine fish	/	10	ND	ND	ND	80%
		Squid/Octopus	*Sepia* spp./ *Octopus* spp.	10	ND	ND	ND	80%
		Black Tiger Shrimps	*Penaeus monodon*	10	ND	ND	ND	80%

2008	CAP	Crabs	*Portunus pelagicus*	5	ND	ND	ND	70%
		Marine fish	/	5	ND	ND	ND	70%
		Squid/Octopus	*Sepia* spp./ *Octopus* spp.	5	ND	ND	ND	70%
		Black Tiger Shrimps	*Penaeus monodon*	5	ND	ND	ND	70%
	Nitrofuran (AOZ, AMOZ)	Black Tiger Shrimps	*Penaeus monodon*	5	ND	ND	ND	80%

Vietnam's budget

Year of analysis & Sampling location	Analyte	Fish sample analysed		No. of samples analysed	Min. value of results (ppb) – wet weight basis	Max. value of result (ppb) – wet weight basis	Average value of result (ppb) – wet weight basis	Average Recovery (%)	Remarks (No. of samples exceeding MRL)
		Common name	Scientific name						
2006	CAP	Crabs	*Portunus pelagicus*	175	0.1	1.3	0.7	70%	49
		Black Tiger Shrimps	*Penaeus monodon*	869	0.1	0.6	0.4	70%	2
		Frozen Black Tiger Shrimps	*Penaeus monodon*	6192	ND	ND	ND	70%	3
		Frozen Boiled Black Tiger Shrimps	*Penaeus monodon*	1992	0.1	0.8	0.5	70%	3
		Others	/	8303	0.1	4.5	1.4	70%	56
	Nitrofuran (AOZ)	Crabs	*Portunus pelagicus*	40	ND	ND	ND	80%	0
		Marine fish	*Penaeus monodon*	660	ND	ND	ND	80%	0
		Squid/ Octopus	*Sepia* spp./ *Octopus* spp.	5774	0.5	1.4	0.8	80%	7
		Black Tiger Shrimps	*Penaeus monodon*	1459	0.5	1.2	0.7	80%	6
		Others	/	5878	0.5	3.2	1.3	80%	16
	Nitrofuran (AMOZ)	Crabs	*Portunus pelagicus*	45	ND	ND	ND	75%	0
		Black Tiger Shrimps	*Penaeus monodon*	659	0.7	0.7	0.7	75%	1
		Frozen Black Tiger Shrimps	*Penaeus monodon*	3834	ND	ND	ND	75%	0
		Frozen Boiled Black Tiger Shrimps	*Penaeus monodon*	1458	ND	ND	ND	75%	0
		Others	/	5671	ND	ND	ND	75%	0

2007	CAP	Crabs	*Portunus pelagicus*	515	0.1	124.1	10.3	70%	15
		Marine fish	/	3,273	0.3	3.3	1.7	70%	9
		Squid/ Octopus	*Sepia* spp./ *Octopus* spp.	3,062	0.1	11.1	3.5	70%	18
		Black Tiger Shrimps	*Penaeus monodon*	24,718	0.1	23.9	3.6	70%	50
		Others	/	2,861	0.1	5.43	1.2	70%	34
	Nitrofuran (AOZ, AMOZ)	Crabs	*Portunus pelagicus*	856	0.5	5.4	1.8	80%	14
		Marine fish	/	1,982	0.5	6.6	2.3	80%	18
		Squid/ Octopus	*Sepia* spp./ *Octopus* spp.	1,230	0.5	8.5	3.1	80%	8
		Black Tiger Shrimps	*Penaeus monodon*	22,403	0.5	51.6	5.7	80%	64
		Others	/	1,300	0.5	2.7	1.5	80%	6
	MG/ LMG	Tra/Basa catfish	*Portunus pelagicus*	22,191	3.3	25	12.2	85%	24
		Black Tiger Shrimps	*Penaeus monodon*	2,913	ND	ND	ND	85%	0
		Others	/	827	4	64	10.7	85%	15

c. Corrective Actions

Not applicable.

5. Problems and Challenges Encountered

Analysis results showed that there were still samples detected with residues of banned substances. This signifies that the use of banned substances in aquaculture does exist. The number of overall violated samples in 2007 was increased to 0.38% from 2006's 0.33%. but the rate of defected samples and total sample in CAP was reduced (2006:0.64%; 2007:0.37%). The number of Vietnamese fishery consignments notified by importing countries due to detection of banned substances residues, such as CAP, NFs, MG/LMG in 2007 is much fewer than previous years. It means that the awareness of the need to stop using banned substances has raised among Vietnamese farmers and the applied control measures for the residues of banned substances in Vietnam proved to be effective.

6. Recommendations and Suggestions for Future Follow up Action

- Due to limited budget for each activity, collected data are not representative enough to reflect the real impact of chemical contaminants and antibiotics residues on fish.
- It would be highly appreciated if the Project could focus on training in new analytical methods, specifically in multi-residues analysis methods in order to improve testing capabilities in fish quality and safety control in the South-East Asia region.