VIETNAM

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I. Introduction

In the integration into the world economy, together with technology innovation for higher productivity and lowered price, Vietnam is also interested in improving product quality to protect consumers' interests and health as well as to meet the technical and food safety requirements of importing countries. With regards to food production in general, particularly in fishery production, technical barriers are mainly focused on environment and ecology system protection and food hygiene and safety requirements to protect consumers' health.

To protect local consumers' health as well as to overcome technical barriers given by big consumers of bivalve mollusc products such as the European Union (EU) and North America, the Sanitation Monitoring Programme for Bivalve Mollusc (BM) production areas in Vietnam has been set up and implemented as a pilot project with Baby Clams (*Meretrix lyrata*) in Tien Giang and Ben Tre since July 1997. So far, the programme has been expanded to include Ho Chi Minh city, Tra Vinh, Kien Giang, Binh Thuan, Thai Binh, Nam Dinh and Quang Ninh provinces, which comprises a total of 18 EU-approved production areas with different species such as Baby Clam (*Meretrix lyrata*), White Baby Clam (*Meretrix Meretrix*), Yellow Clam (*Paphia sp.*), Antique Ark (*Anadara antiquata*) and Blood Clam (*Tegillarca granosa*).

The implementation of the programme is in accordance with the regulation on sanitation monitoring in bivalve mollusc production areas, Manual of the Sanitation Monitoring Programme for BM production areas and amending document thereof of the National Agro-Forestry-Fisheries Quality Assurance Department (NAFIQAD) is in compliance with European Commission (EC) regulations.

II. Objectives and Goals

The objectives and goals look into:

- Protecting consumer's health
- Reducing damages due to harvest of BM from insanitary production areas
- Promoting export of BM
- Contributing to sustainable development of BM resources

III. Survey Methodologies

a. Sampling Method, Sampling Site, Target Species, Number of Samples & Sampling Size

In 2011, the Monitoring Programme was applied continuously to 15 EU approved bivalve mollusc production areas located in the following eight provinces/cities in Vietnam:

- Thai Binh
- Nam Dinh
- Tien Giang
- Ben Tre

- Ho Chi Minh City
- Binh Thuan
- Tra Vinh
- Kien Giang

The sampling method and size was conducted in accordance to that stated on the Manual of the Sanitation Monitoring Programme for Bivalve mollusc production areas. Meanwhile, the species sampled includes Baby Clam (*Meretrix lyrata*), Yellow Clam (*Paphia sp.*), Blood Clam (*Tegillarca granosa*), Antique Ark (*Anadara subcrenata*), Antique Ark (*Anadara antiquata*) and Scallop (*Chlamys nobilis*). A total of 1,277 samples were analyzed in the Monitoring Programme.

b. Method of Analysis

No.	Criteria	Sampling frequency	Maximum Permitted Limits (MRLs)	Analysis method
1	Lipophilic toxins	Twice (*) or 4 times (**) per month	Negative or: • Total Okadaic acid + Dinophysis toxins + Pecteno toxins: 160 µg/kg • Yessotoxins: 1mg/kg • - Azaspiracids: 160 µg/kg	Mouse Bioassay (MBA) or High Performance Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS)
2	Paralytic Shellfish Poisoning (PSP)	Twice (*) or 4 times (**) per month	Negative or 800 µg /kg mollusc flesh and intra-valvular liquid	MBA or LC/MS/MS
3	Amnesic Shellfish Poisoning (ASP)	Twice (*) or 4 times (**) per month	20 mg domoic acid/kg mollusc flesh and intra-valvular liquid	High Performance Liquid Chromatography (HPLC) or Liquid Chromatography Mass Spectrometer (LC/MS)
(*): half-day tidal production areas *(**): production areas where harvesting is done for the whole month*				

Table V1: Analysis method and MRLs for toxins

c. Limit of Detection & Limit of Quantification

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d. National Regulatory Limits

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IV. Results and Discussions

a. Participation in Inter-Laboratory Proficiency Testing & Results

In 2011, 3 labs had participated in the programme of QUASIMEME for ASP. All of the three lab results are optimal.

b. Survey Results & Discussion

Parameters	Analysis	Number of positive samples	Value	MRLs	Number of samples with detection level exceeding MRLs
PSP (Neg- Pos)	875	0	• 0	Neg	0
Lipophylic (Neg- Pos)	1236	185	Pos	Neg	185
ASP (µg/g)	899	5	3.7-5.5 (µg/g)	20	0

Table V2: Survey results

PSP had not been detected in all the samples collected from the 15 production areas. For lipophilic toxins, 185 analysis were positive with lipophilic toxins among 1236 analysis (including samples from intensified sampling) analyzed samples, making up 14.97%. For some areas, lipophilic was detected in whole BM (in both mollusc flesh and intra-valvular liquid). However, testing result for lipophilic was negative for adductor (of scallop) or flesh (of Antique Ark) sample. Meanwhile, five out of 899 samples were found to contain 3.7 – 5.5µg/g of ASP, but this is much lower than warning limit of 20µg/g.

c. Corrective Actions

The lipophilic content was found to exceed MRL. After the positive detection of this toxin by MBA in BM, NAFIQAD notified for a stop-harvesting from the above-mentioned areas and required relevant local CA to intensify the sampling to test for this toxin and take water samples to survey the variation of alga.

V. Problems and Challenges Encountered

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VI. Recommendations and Suggestions for Future Follow-Up Action

As the budget for biotoxins monitoring activity is limited, the collected data are insufficient to reflect the real impact of biotoxins in BM. It is recommended that the new project could focus on building up capacity in food safety risk analysis and traceability of fish and fishery products in South-East Asia countries.