MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT

NATIONAL AGRO-FORESTRY-FISHERIES QUALITY ASSURANCE DEPARTMENT

REPORT

On implementation results of

The Residues Monitoring Program for Certain Harmful Substances in aquaculture fish and products thereof in 2012

and

Program Plan in 2013

Hanoi, March 2013

PART I

RESULTS OF THE MONITORING PROGRAM FOR CERTAIN HARMFUL SUBSTANCES RESIDUES IN 2012

1. General

The Residues Monitoring Program for Certain Harmful Substances in aquaculture fish and products thereof (hereafter called as "Monitoring Program") has been implemented with allocated budget and plan approved by the Ministry of Agriculture and Rural Development. Relevant bodies carried out the Program in accordance with the regulations promulgated by the Decision No. 130/2008/QD-BNN of 31 December 2008 of the Ministry of Agriculture and Rural Development, procedures as described in the Practice Manual for residues control as well as relevant guidance published by the National Agro-Forestry-Fisheries Quality Assurance Department (NAFIQAD), which are also in compliance with EC regulations.

2. Scope and species monitored in 2012

2.1. Scope and species monitored by regions

Table 1: Scope of 2012 Monitoring Program

Region	Participating provinces	No. of aqua. areas	Aquaculture species
North	Quang Ninh, Hai Phong, Thai Binh, Nam Dinh, Ninh Binh, Thanh Hoa, Nghe An, Ha Tinh	34	Black Tiger Shrimp *(Penaeus monodon),* White shrimp *(Penaeus vannamei)*, Tilapia (*Oreochromis spp*), Crab (*Scylla serrata*), Four-eyes sleeper (*Bostrichthys sinenesis Lacepede)*
Centre	Quang Binh, Quang Tri, Thua Thien Hue, Quang Nam, Quang Ngai, Binh Dinh, Kontum, Phu Yen, Khanh Hoa, Ninh Thuan	49	Black Tiger Shrimp (*Penaeus monodon*), White shrimp (*Penaeus vannamei*), Catfish (*Pangasius hypophthalmus*), Tilapia (*Oreochromis spp*), Grass carp (*Ctenopharyngodon idellus)*
South	Ben Tre, Tien Giang, Long An, Hochiminh City, Dong Nai, Ba Ria - Vung Tau, Binh Thuan, Tay Ninh, Ca Mau, Bac Lieu, Soc Trang, An Giang, Can Tho, Dong Thap, Hau Giang, Kien Giang, Tra Vinh, Vinh Long	77	Black Tiger Shrimp (*Penaeus monodon*), Giant prawn (*Macrobrachium rosenbergii*), White shrimp (*Penaeus vannamei*), Catfish (*Pangasius hypophthalmus*), Tilapia (*Oreochromis spp*), Climbing perch (*Anabas testudineus*), Snakehead (*Ophiocephalus striatus*), Feather back Fish (*Notopterus notopterus*)
Total	**36provinces/cities**	**160**	

2.2. Sampled species

Under the Monitoring Program 2012, samples had been taken at all stages of production chain, from hatchery to commercial size farming stage. Details of sampling at each stage and groups to be analyzed are described in the Table 2.

Table 2: Samples taken in 2012

No.	Production stage	Samples taken	Testing parameters
1	Hatchery	Hatchery water	CAP
2	Aquaculture site	Fish farmed at all stages	A1, A3, A6, B1, B2a, B3a, B3c, B3d, B3e
3	Middlemen	Fishery raw materials	CAP

Note:

- *A1 group (Stilbens – salts and derivatives of stilbens): Diethylstilbestrol*
- *A3 group (Steroids): Methyltestosterone*
- *A6 group (prohibited antibiotics): Chloramphenicol (CAP), Nitrofurans (NTRs)*
- *B1 group (Anti-bacteria substances): Groups of Tetracycline, Quinolones, Sulfonamide, Trimethoprim, Florfenicol.*
- *B2a group (Anti-worm substances, parasiticides): Praziquantel and Trifluralin were tested together with B2a group.*
- *B3a group (Organochlorine pesticides): HCB, Lindane, Heptachlor, Aldrin, Dieldrin, Eldrin, Chlordan, DDT*
- *B3c group (heavy metals): Pb, Cd, Hg*
- *B3d group (Mycotoxins): Aflatoxin*
- *B3e group (Dyes): Malachite Green/Leucomalachite Green.*

3. Sampling and testing

3.1. Sampling

In 2012, the sampling was carried out by the local competent authorities in compliance with the plan approved by the Ministry of Agriculture and Rural Development. However, following monthly reports by local competent authorities, NAFIQAD Headquarter, NAFIQAD CRA (Central Region Authority) and NAFIQAD SRA (Southern Region Authority) amended monthly sampling plan to be appropriate to current local context.

Sampling activities carried out in 2012 by regions covered by NAFIQAD Headquarter, NAFIQAD CRA and NAFIQAD SRA are showed in Table 3.

Table 3: Sampling activities in 2012

Regions	North		Centre		South		Total		
Samples by species	**Plan**	**De facto**	**Plan**	**De facto**	**Plan**	**De facto**	**Plan**	**De facto**	**Difference**
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)=(8)-(9)*
Catfish (*Pangasius hypophthalmus*)	0	0	13	13	1425	1365	1438	1378	-60
Tilapia (*Oreochromis spp*),	70	69	13	13	142	129	225	211	-14
Four-Eyes Sleeper (*Bostrichthys sinenesis Lacepede)*	5	3	0	0	0	0	5	3	-2
Climbing perch (*Anabas testudineus*)	0	0	0	0	49	49	49	49	0
Snakehead (*Ophiocephalus striatus*)	0	0	0	0	71	69	71	69	-2
Grass Carp *(Ctenopharyngodon idellus)*	0	0	5	5	0	0	5	5	0
Featherback fish *(Notopterus notopterus)*	0	0	0	0	9	9	9	9	0
White shrimps (*Penaeus vannamei*)	126	90	383	386	397	353	906	829	-77
Black Tiger shrimps (*Penaeus monodon*)	96	84	66	66	1194	1150	1356	1300	-56
Giants Prawn (*Macrobrachium rosenbergii*)	0	0	0	0	23	22	23	22	-1
Crab (*Scylla serrata*)	18	13	0	0	0	0	18	13	-5
Raw materials at middlemen	18	18	48	48	95	95	161	161	0
Fish breeds/hatchery water at shrimps farm	30	30	44	43	144	119	218	192	-26
TOTAL	**363**	**307**	**572**	**574**	**3549**	**3360**	**4484**	**4241**	**-243**

Under the Monitoring Program 2012, total of 4241 samples were taken, in which 3888 samples of aquaculture fish, 192 of juvenile fish and hatchery water and 161 of fish raw materials taken at middlemen, completing ≈ 97% of the Plan.

The above table shows that the sampling done in regions was relatively close to the plan. However, there is still insignificant difference compared to the plan mainly due to the adjustment of sampling plan in accordance with the actual farming process (based on monthly monitoring results). Number of samples taken was less than the one planned for some reasons such as: reduction of aquaculture surfaces and production, diseases occurred in some areas causing death and impossible sampling and natural disaster (flood, tornado…).

3.2 Testing results

In 2012, number of violated samples was 64 over 4241 analyzed samples (≈1.5%), higher than that in 2011, which was 32 over 3531 (≈0.9%), due to the detection of Enrofloxacin residues (41 samples); however, of which there were only 03 samples detected with Enrofloxacin/Ciprofloxacin at level of ≥ 100ppb as prescribed by the EU regulations. Enrofloxacin has been included in the list of chemicals and antibiotics prohibited from use in fishery production and trade in Vietnam as stipulated in Circular No. 03/2012/TT-BNNPTNT of January 16, 2012 of the Ministry of Agriculture and Rural Development. Comparison in violated samples of 2011 and 2012 is as follows:

Groups \ **Year**	**Violated samples/total analyzed samples (%)**	
	2011	**2012**
Group **A1**(Stilbens- *salts and derivatives of stilbens*)	0	0
Group **A3** (Steroids)	0	0
A6 group (prohibited antibiotics)	0.87	0.29
B1 group (Anti-bacteria substances)	0.47	2.48
B2a group (Anti-worm substances, parasiticides) and Trifluralin	0.88	0.48
B3a group (Organochlorine compounds)	0	0
Group **B3c** (Heavy metals)	0.46	0.48
Group **B3d** *(Mycotoxins)*	0	0
Group **B3e** (Dyes)	0	0

Testing results for harmful substances residues in 2012 are showed in Table 4.

Table 4. Testing results in 2012

Monitored groups	Monitored substances	Testing methods	Analysis		MRLs (ppb)	Number of violated samples
			Plan	De facto		
1. Aquaculture fish						
A1. STILBENES	Diethylstilbestrol	LC/MS/MS	**66**	**64**	ND	0
A3. Steroids	Methyltestosterone	LC/MS/MS	**63**	**62**		0
A6. Chloramphenicol	Chloramphenicol	LC/MS/MS	**685**	**669**		**2**
A6.NITROFURANS		LC/MS/MS	**976**	**948**		0
Nitrofurantoin	AOZ	LC/MS/MS	**976**	**948**	ND	0
Furaltadone	AMOZ	LC/MS/MS	**976**	**948**		0
Furazolidone	AHD	LC/MS/MS	**976**	**948**		0
Nitrofurazone	SEM	LC/MS/MS	**976**	**948**		0
B1. Antibiotics Screening methods	TETRACYCLINES SULFONAMIDES QUINOLONES	ELISA			0	0
B1. Antibiotics Confirmation method	**TETRACYCLINES**	LC/MS/MS	**164**	**165**		0
	Chlotetracycline	LC/MS/MS	**164**	**165**	100	0
	Oxytetracycline		**164**	**165**	100	**2**
	Tetracycline		**164**	**165**	100	0
	SULFONAMIDES	LC/MS/MS	**711**	**694**	100	0
	Sulfadimethoxine	LC/MS/MS	**711**	**694**	100	0
	Sulfachloropiridazine		**711**	**694**		0
	Sulfamethoxazole		**711**	**694**		**1**
	Sulfamethazine (Sulfadimidine)		**711**	**694**		**1**
	Sulfadiazine		**711**	**694**		**1**
	QUINOLONES	LC/MS/MS	**840**	**818**		0
	Enrofloxacin/Ciprofloxacin	LC/MS/MS	**840**	**818**	100	**3** ***(EU regulations)*** **41** ***(Vietnamese regulations)***
	Enrofloxacin		**840**	**818**	ND	
	Flumequine		**840**	**818**	600 for fish, 200 for shrimps and crabs	0
	Difloxacin		**840**	**818**	300	0
	Sarafloxacin		**840**	**818**	30	0
	Oxolinic acid		**840**	**818**	100	0
	Danofloxacine		**840**	**818**	100	0
	Florfenicol	LC/MS/MS	**130**	**124**	1000	0
	Trimethoprim	LC/MS/MS	**168**	**135**	50	0

Monitored groups	Monitored substances	Testing methods	Analysis		MRLs (ppb)	Number of violated samples
			Plan	De facto		
B2a. Anti-worm substances, parasiticides Trifluralin	Praziquantel	GC/MS	**423**	**408**	ND	**1**
	Trifluralin	GC/MS	**442**	**429**		**3**
B3a. Organochlorine pesticides	Aldrine	GC - ECD	**219**	**209**	200	0
	Dieldrine	GC - ECD	**219**	**209**	200	0
	Endrine		**219**	**209**	50	0
	Heptachlor		**219**	**209**	200	0
	DDT		**219**	**209**	1000	0
	Chlordane		**219**	**209**	50	0
	Hexachorobenzen		**219**	**209**	200	0
	Lindane		**219**	**209**	1000	0
B3c. Heavy metals	Hg	AAS	**219**	**212**	500	0
	Cd		**219**	**209**	50 for fish, 500 for shrimps	0
	Pb		**219**	**209**	300 for fish, 500 for shrimps	**1**
B3d. Mycotoxins	Aflatoxine	HPLC	**161**	**156**	4	0
B3e. Dyes	Malachite Green/ Leucomalachite Green	LC/MS/MS	**249**	**232**	ND	0
	Crystal Violet/ Leucocrytal Violet	LC/MS/MS	**35**	**35**		0
2. Raw materials at middlemen						0
A6. Chloramphenicol	Chloramphenicol	LC/MS/MS	**161**	**161**	ND	0
3. Hatchery water						0
A6. Chloramphenicol	Chloramphenicol	LC/MS/MS	**217**	**193**	ND	**9**
Total						**26 (EU regulations) 64 (Vietnamese regulations)**

3.2.1. For fish samples collected at farms

- *Diethylstilbestrol* ***(group A1)*** residues were not detected in 64 analyses; *Methyltestosterone* ***(group A3)*** were not detected in 62 analyses of aquaculture fish. As previous years, these results showed no abuse of hormones or growth stimulators in aquaculture industry in Vietnam.

- Prohibited antibiotics ***(Group A6)***:

+ Among 669 analyses, 02 samples of aquaculture fish (0.29%) were detected with *Chloramphenicol* residues of 0.35-5.0 ppb; compared with 2011: Among 511 analyses, there was only 01 violated sample (0.2%).

+ *Nitrofurans* were not detected in samples of aquaculture fish / 948 analyses, there is a reduction in comparison with 2011: 04 violated samples / 526 analyses (0.76%).

This demonstrated that the abuse of prohibited antibiotics group A6 in aquaculture is in ongoing, but the tendency is reduced in comparison with previous years. Therefore, this group needs to be intensively controlled in 2013.

- Group B3e – Dyes: Malachite Green and Crystal Violet (Gentian violet) were not detected in samples of aquacultured fish designated for analysis of these criteria (232 analyses of Malachite Green, 35 - Crystal Violet). This no-detection and monitoring results of previous years showed that the farmer's awareness in the use of Malachite Green and Crystal Violet (Gentian violet) for fish disease prevention/treatment has been improved. Since 2009, Crystal Violet (Gentian violet) has been added to group B3e, but it was not detected in aquaculture fish. Therefore, it will be taken out of the Monitoring Program in 2013.

- For restricted antibiotics ***(group B1)***:

+ *Oxytetracycline* residue level of 3.745-3.973 ppm was detected in 02 samples of aquaculture fish / 165 analyses for Tetracycline group. Residues of this group had not been found between the years 2006-2010; therefore, this group needs to be controlled in 2013.

+ Sulfonamide residues exceeding permitted MRLs was not found in 694 analyses (a reduction in comparison with the year 2010 of which there were 2 violated samples / 577 analyses, accounting for 0.35 %).

+ Since March 2012, Circular No. 03/2012/TT-BNNPTNT of January 16, 2012 adding Enrofloxacin to the list of antibiotics, chemicals banned from use in fishery production and trade in Vietnam has been implemented, Enrofloxacin criterion was included in the Residues Monitoring Program. In 2012, 41 aquaculture fish samples over 818 analyses for *Quinolones* (accounting for 1.13%) were found with *Enrofloxacine* residue levels of 1.8 ppb up to 3.480 ppb. However, of which only 03 samples (including 01 commercialized-size catfish, 01 climbing perch and 01 snakehead) were detected with total residues of *Enrofloxacine/Ciprofloxacin* $\geq$ 100 ppb, exceeding EU MRLs.

+ *Trimethoprim* residues exceeding MRLs were not detected in 135 analyses.

+ *Florfenicol* residues exceeding MRLs were not found in 124 analyses.

All above mentioned results showed that there is still the abuse of antibiotics groups B1 (especially *Enrofloxacine/Ciprofloxacin – Quinolones* group) for fishery disease treatment.

- For anti-worm substances and parasiticides ***(B2a group)***, there was 01 sample detected with *Praziquantel* residues in 408 aquaculture fish analyses.

+ *Trifluralin* was detected in 03 aquaculture fish samples (including commercial-sized catfish and black tier shrimp) over 429 analyses with detection levels from 4.59 ppb to 50.22 ppb (accounting for 0.69%, a reduction of 1,27% in comparison with 2011: 29 samples / 456 analyses – 1.97%). Monitoring results showed that in spite of Circular No. 20/2010/TT-BNNPTNT of 02 April 2010 adding *Trifluralin* to the list of chemicals and antibiotics prohibited in aquaculture, *Trifluralin* is still abused but with a reducing tendency in comparison with 2011. Therefore, in 2013, together with control measures taken by Directorate of Fisheries to fish farms, establishments producing and trading chemicals and antibiotics prohibited in aquaculture, intensified control measures to this substance should be continued under the Monitoring Program 2013.

- For environment contaminants:

+ There was no detection of Organochlorine pesticides residues ***(Group B3a)*** in 209 analyses.

+ For heavy metal residues ***(Group B3c):*** 01 white shrimp sample / 209 analyses (0.46%) was found with heavy metal residue level of 400 ppb, which was exceeding MRLs.

- No *Aflatoxin* (B1) was detected in 156 analyses.

3.2.2. For fish samples collected at middlemen

Chloramphenicol residues were not found in fish samples collected at middlemen.

3.2.3. For juvenile fish and shrimp hatchery water samples

09 shrimp hatchery water samples / 193 analyses (3.96%) were found with *Chloramphenicol* residue levels of from 0.26 ppb to 3.76 ppb. These results reflect the ongoing abuse of *Chloramphenicol*, but with a decreasing tendency in comparison with the years 2010 and 2011.

3.3. Actions taken against violations

3.3.1. For aquaculture fish

a. *Violations related to Chloramphenicol, Nitrofurans contaminations*

- Requesting farm owners to suspend the harvesting and apply relaying regime / surveillance;
- Requesting processors not to purchase raw materials from aquaculture sites contaminated with residues of banned chemicals and antibiotics;
- Carrying out the investigation of contamination cause and intensifying the sampling. When the results of intensified samples testing were satisfactory, the harvesting in relevant aquaculture sites was allowed;
- Intensifying the sampling in contaminated aquaculture farms/areas in the following crop;
- Strengthening communication on relevant regulations and harmfulness of using banned chemicals and antibiotics to farmers.

b. *Violations related to Tretracycline, Quinolones residues exceeding the MRLs*

- Requesting farms to suspend the harvesting, apply relaying regime / surveillance;

- Intensifying the sampling;
- Until the antibiotics detection levels were under the MRLs, the relaying regime was removed and the harvesting was allowed.
- Guiding farmers to comply with the withdrawal time of veterinary drugs prior to harvesting.

c. Violations related to Pb residues

- Requesting farms to suspend the harvesting, apply relaying regime / surveillance;
- Carrying out investigation of contamination cause and intensifying the sampling.
- When the results of intensified samples testing were satisfactory, the relaying regime was removed and the harvesting was allowed.

3.3.2. For hatchery water

- Requesting to stop sale and apply relaying regime / surveillance from contaminated hatchery;
- Carrying out investigation of contamination cause and intensifying the sampling.
- Revoking relaying regime when the testing results of intensified samples were satisfactory, then sale was allowed;
- However, since juvenile shrimps in contaminated hatchery basins died of disease, the hatchery let water out and stopped farming. Therefore, intensified samples would be taken when the farming restarts.
- Strengthening communication on relevant documents and harmfulness of using banned chemicals and antibiotics to farmers, recommending hatchery and farm owners to check composition of drugs indicated on the label prior to purchase and use, do not use drugs containing banned substances or substances without clear origin…

PART II

2013 PLAN - RESIDUES MONITORING PROGRAM FOR CERTAIN HARMFUL SUBSTANCES IN AQUACULTURE FISH

Based on monitoring results of 2012 and survey results on current aquaculture status, the 2013 Plan has been set up as follows:

1. Species and subjects to be monitored:

a. Principles to identify species and subjects to be monitored:

- Aquaculture species with large production;

- No sampling of veterinary drugs, aquatic feeds, aquatic breeds and hatchery water to test for banned chemicals and antibiotics residues. This activity will be carried out by relevant Departments in charge of veterinary drugs, feeds and breeds control.

b. Some inland fisheries with small production (5-10 tons/year) as reported by local competent authorities such as: carps, grass carps, tilapia, pomfret… shall be monitored and sampled under Post-harvest Monitoring Program.

c. In 2013, following species will be sampled:

Species:

- Tra catfish (*Pangasius hypophthalmus*)
- Tilapia (*Oreochromis spp*)
- Climbing perch *(Anabas testudineus)*
- Snakehead *(Ophiocephalus striatus)*
- Black tiger shrimps (*Penaeus monodon*)
- White shrimp (*Penaeus vannamei*)
- Giant prawn (*Macrobrachium rosenbergii*)
- Crab (*Scylla serrata*)

2. Criteria to be analyzed

Following EU guidelines on the setting up of the Residue monitoring program of chemicals and antibiotics residues in aquaculture fish for third countries, monitoring results of previous years and feedbacks from importing markets, testing groups in 2013 are designated as follows:

Table 5: Testing groups in 2013

No.	Substrates	Designated testing groups
1	Extensive aquaculture fish	- B3a: Organochlorine pesticides, including Lindan, HCB, Heptachlor, Aldrin, Dieldrin, Endrin, DDT, Chlordane - B3c: Pb, Hg, Cd

No.	Substrates	Designated testing groups
2	Intensive aquaculture fish	- A6: Chloramphenicol and Nitrofurans (AOZ (3-amino-2 oxazolidinone); AMOZ (3- amino - 5 morfolinomethyl-1,3 oxazolidin-one); AHD (1-aminohydantoin); SEM - Semicarbazide). - B1: Tetracylines group (Oxytetracycline, Tetracycline), Sulfonamides (Sulfadiazine, Sulfadimidine (Sulfamethazine), Sulfamethoxazole, Sulfadimethoxine, Sulfachlorpyridazine), Quinolones group (Sarafloxacine, Ciprofloxacine, Enrofloxacine, Flumequine), Trimethoprim, Florfenicol. - B2a and Trifluralin: Trichlorfon; Trifluralin. - B3a: Organochlorine pesticides, including Lindan HCB, Heptachlo, Aldrin, Dieldrin, Endrin, DDT, Chlordane - B3c: Pb, Hg, Cd - B3d: Aflatoxin (B1) - B3e: Malachite Green/Leuco Malachite Green For aquaculture fish, following additional tests are required: - A1: Diethylstillbestrol - A3: Methyltestosterone

3. Scheduled sampling plan

Samples shall be monitored for harmful substances residues throughout the aquaculture, the sampling based upon production volume will be carried out as follows:

- For intensive shrimps farming: the rate will be 1 sample / 100 tons of produce for black tiger shrimps; 1 sample / 150 tons for white shrimps. There is a difference between these rates because white shrimps are now intensively farming with high density and production (an average of 8-12 tons/ha, doubled compared to black tiger shrimps production). Consequently, the rate applied to white shrimps is adequate to an effective control of chemicals and antibiotics residues.

- For extensive shrimps farming: this farming method is only applied in several provinces with large water surface and saline forest for aquaculture; farmers localize big tidy areas (over 5 ha) and use natural breeds. With big aquaculture areas and low raising density, farmers do not use feeds and veterinary drugs for fish disease prevention/treatment in this case. Therefore, farmers applying this aquaculture method never feed and treat the fish with veterinary drugs. For this reason, for extensive shrimps farming, the sampling will be carried out to test for environmental contaminants (B3a, B3c) with a frequency of 1-2 samples/area/year at the time of commercial-sized products.

- For Tra catfish: The rate is 1 sample / 500 tons of produce. A such low rate has been proposed due to the super-intensive farming method at 1-hecta farm with 300-500

tons/ha of production. For this reason, the proposed rate can assure the effective control of chemical and antibiotics residues on Tra catfish.

Samples must be taken in compliance with procedures described in the Practice Manual of the Monitoring Program in order to ensure the accuracy of testing results and reflect the current situation of farming areas.

Sampling plan scheduled for 2013 are showed in Table 6.

Table 6: Number of samples to be taken by species

No.	Aquaculture fish / Others species	Estimated production in 2013 categorized by farming methods			Number of samples to be taken
		Intensive farming (ton)	Extensive farming (ton)	Total production (ton)	
1	Tra catfish	710,710	-	710,710	1,344
2	Tilapia	41,079	50	41,129	191
3	Climbing perch	13,000	-	13,000	26
4	Snakehead	13,315	-	13,315	47
5	Black tiger shrimp	130,112	541	130,653	1,152
6	White shrimp	164,797	-	164,797	1,372
7	Giant prawn	1,797	-	1,797	15
8	Crab	1,600	-	1,600	16
Total		**1,076,409**	**591**	**1,077,000**	**4,163**

4. Sampling plan and criteria to be tested by groups

In accordance with the EU regulations (Directives 96/22/EC, 96/23/EC, 2377/90/EC and 86/363/EC ...) and guidelines on setting and carrying out control of chemical, antibiotics residues in aquaculture fish in third countries, residues monitoring program in 2013 focuses on monitoring aquaculture subjects, specifically:

- Continuing to intensively test aquaculture fish for CAP and NTRs.

- Continuing to intensively test aquaculture fish for Enrofloxacine/Ciprofloxacin – Quinolones residues.

- Reducing number of follow-up samples for B3d, B3e and Florfenicol.

- Continuing to intensively test Tra catfish for Trifluralin, together with Group B2a.

- Removing tests for Crystal Violet/Leucocrytal Violet – Group B3e because the 3-year monitoring results did not show any violation and no-consignments have been notified.

Sampling plan and criteria to be tested by groups are shown in Table 7 and ensure the rate of 1/3 of the samples tested for criteria in group A and 2/3 - for criteria in group B in accordance with the guidance of the EU.

Table 7: Sampling plan for 2013

No	Substrates	Estimated production in 2013 categorized by farming methods		Samples to be taken	Number of samples to be analysed upon testing groups													
					A1	A3	A6		B1					B2a and Triflu ralin	B3a	B3c	B3d	B3e
		Intensive farming (ton)	Extensive farming (ton)				CAP	NF	TC	Sul	Qui	Flor	Trime					
1	**Tra catfish**	710,710	0	1,344	46	49	213	214	50	169	173	53	51	94	54	56	48	101
2	**Tilapia**	41,079	50	191	12	12	26	23	12	17	22	11	12	19	13	16	10	13
3	**Climbing perch**	13,000	0	26	1	1	4	4	1	3	3	1	1	2	1	1	1	2
4	**Snakehead**	13,315	0	47	2	2	8	7	2	7	7	2	2	4	3	3	2	2
5	**Black tiger shrimp**	130,112	541	1,152	0	0	239	232	60	157	158	43	49	85	53	47	50	57
6	**White shrimp**	164,797	0	1,372	1	1	265	256	102	157	174	45	80	142	85	94	71	101
7	**Giant prawn**	1,797	0	15	0	0	3	3	1	2	3	0	1	2	2	2	1	1
8	**Crab**	1,600	0	16	0	0	4	1	0	4	3	0	3	3	4	5	0	3
Total		**1,076,409**	**591**	**4,163**	**62**	**65**	**762**	**738**	**228**	**516**	**543**	**155**	**199**	**351**	**215**	**224**	**183**	**280**

Note: CAP - Chloramphenicol; NF – Nitrofurans; TC - Tetracyclines; Sul - Sulfonamides; Qui - Quinolones; Flo – Flofenicol; Trime – Trimethoprim.

5. Testing plan by each group (please see Annex attached)

PART III
CONCLUSION

The 2012 Residues Monitoring Program for Certain Harmful Substances in aquaculture fish was set up and implemented in accordance with the regulations promulgated by the Decision No. 130/2008/QD-BNN of 31 December 2008 of the Ministry of Agriculture and Rural Development, procedures as described in the Practice Manual for residues control as well as relevant guidance published by the National Agro-Forestry-Fisheries Quality Assurance Department (NAFIQAD), which are also in compliance with EC regulations.

The setting up of the Plan 2013 is based upon EC relevant legislation documents/guidance on the establishment of the Third Country Residue Monitoring Program, results of the 2012 program as well as notifications of importing countries and information from the Post-harvest Monitoring Program. This Plan could be modified in accordance with monthly reports on aquaculture status, disease situation and the use of veterinary drugs, feeds, chemicals and probiotics in aquaculture industry in Vietnam.

Annex: TESTING PLAN BY GROUP

Group of substances		No. of analysis	Substance	Matrices	Screening method	Confirmatory method	LOD by screening method (ppb)	LOD by confirmatory method (ppb)	MRLs (ppb)	NAFIQAD Laboratory	Other Laboratories (designated)
A1	Stilbenes	**64**	Diethylstilbestrol	Fish meat	-	LC-MS/MS	-	0.5	ND	NAFI 4,6	
					ELISA		0.5	-		NAFI 6	
A3	Steroids	**67**	Methyltestosterone	Fish meat	-	LC-MS/MS	-	0.2-0.5	ND	NAFI 4,6	
A6	Chloramphenicol + Nitrofurans								ND		
A6	Chloramphenicol	**791**	Chloramphenicol	Fish meat, hatchery water	ELISA	-	0.2 -0.3		ND	NAFI 1,2,3,4,5,6	
				Fish meat, water	-	LC-MS/MS	-	0.1		NAFI 1,2,3,4,5,6	
	Nitrofurans	**773**							ND		
	Furaltadone metabolite	**773**	AMOZ	Fish meat	-	LC-MS/MS	-	0.1-0.5		NAFI 1, 2,3,4,5,6	Intertek Vietnam, Can Tho Branch
	Furazolidone metabolite	**773**	AOZ								
	Nitrofurantoin metabolite	**773**	AHD					0.3-1.0		NAFI 1,2,3,4,5,6	
	Nitrofurazone metabolite	**773**	SEM								

Group of substances		No. of analysis	Substance	Matrices	Screening method	Confirmatory method	LOD by screening method (ppb)	LOD by confirmatory method (ppb)	MRLs (ppb)	NAFIQAD Laboratory	Other Laboratories (designated)
B1	Tetracycline	**236**	Oxytetracycline	Fish meat	-	HPLC LC/MS/MS	-	10 -20	100	NAFI 1,2,3,4,5,6	
			Tetracycline					10-20	100		
	Quinolones	**566**	Ciprofloxacin	Fish meat	ELISA	HPLC-FLD, LC/MS/MS	5-10	2-10	100	NAFI 1,2,3,4,5,6	Intertek Vietnam, Can Tho Branch
			Enrofloxacin					2-10			
			Difloxacin					2-10	600 for fish, 200 for other fisheries		
			Sarafloxacin					2-10	300		
			Danofloxacin					0.2-10	30		
			Flumequin					3-10	100		
			Oxolinic acid					5-10	100		
	Sulfonamides	**538**	Sulfadiazine	Fish meat		HPLC-FLD, LC/MS/MS		10-30	100	NAFI 1,2,3,4,5,6	Intertek Vietnam, Can Tho Branch
			Sulfathiazole								
			Sulfadimidine								
			Sulfamethoxazole								
			Sulfadimethoxine								
			Sulfachlorpyridazine								
	Trimethoprim	**205**	Trimethoprim	Fish meat	-	HPLC-PDA, LC-MS/MS	-	10 - 20	50	NAFI 1,2,3,4,5,6	
	Florfenicol	**154**	Florfenicol	Fish meat	-	LC/MS/MS	-	0.1	1000	NAFI 1,2,3,4,5,6	Intertek Vietnam, Can Tho Branch
B2a and Triflu -ralin	Anthelmintics	**358**	Trichlorfon (Dipterex)	Fish meat	-	LC/MS/MS	-	5	ND	NAFI 4	
					HPLC/PDA		20	-		NAFI 1,6	
	Trifluralin	**358**	Trifluralin	Fish meat	-	GC/MS GC-ECD	-	0.5-1.0	100	NAFI 1,3, 4,5,6	
					Elisa		1.0			NAFI2	

Group of substances		No. of analysis	Substance	Matrices	Screening method	Confirmatory method	LOD by screening method (ppb)	LOD by confirmatory method (ppb)	MRLs (ppb)	NAFIQAD Laboratory	Other Laboratories (designated)
B3a+B3c+B3d + B3e											
B3a	Organochlorine compounds including PCBs	**221**	Aldrin	Fish meat		GC-ECD GC-MS		0.7 – 18.5	200	NAFI 1,3,4,5,6	Intertek Vietnam, Can Tho Branch. - EDC
			Dieldrin						200		
			Endrin						50		
			Heptachlor						200		
			DDT						1000		
			Chlordane						50		
			BHC						200		
			Lindane						1000		
B3c	Chemical elements	**229**	Pb	Fish meat	-	AAS ICP-OES ICP-MS	-	5-25	300 for fish, 500 for shrimps	NAFI 1,2,3,4,5,6	- SGS Vietnam. - Intertek Vietnam, Can Tho Branch. - EDC
			Hg				-	5-10	500		
			Cd				-	5	50 for fish, 500 for shrimps		
B3d	Mycotoxins	**187**	Aflatoxine (B1)			HPLC -FLD		0.3-1	4	NAFI 1,2,3,4,5,6	
B3e	Dyes	**283**	Malachite Green/ Leucomalachite Green	Fish meat	ELISA		0.5		ND	NAFI4,6	Intertek Vietnam, Can Tho Branch
					-	LC-MS/MS	-	0.5		NAFI 1, 2,3,4,6	
					-	HPLC-PDA	-	1.0		NAFI 1,5	