

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 2011  
*and*  
Program Plan in 2012**

Hanoi, March 2012

# PART I

## RESULTS OF THE MONITORING PROGRAM FOR CERTAIN HARMFUL SUBSTANCES RESIDUES IN 2011

### 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/QĐ-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 2011

#### 2.1. Scope and species monitored by NAFIQAD regional authorities

**Table 1: Scope of 2011 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	35	Black Tiger Shrimp ( <i>Penaeus monodon</i> ), White shrimp ( <i>Penaeus vannamei</i> ), tilapia ( <i>Oreochromis spp</i> ), Crab ( <i>Scylla serrata</i> ), Four-eyes sleeper ( <i>Bostrichthys sinensis</i> <i>Lacepede</i> )
Centre	Quang Binh, Quang Tri, Thua Thien Hue, Da Nang, Quang Nam, Quang Ngai, Binh Dinh, Phu Yen, Khanh Hoa, Ninh Thuan	50	Black Tiger Shrimp ( <i>Penaeus monodon</i> ), White shrimp ( <i>Penaeus vannamei</i> ), catfish ( <i>Pangasius hypophthalmus</i> ), tilapia ( <i>Oreochromis spp</i> ), Grass carp ( <i>Ctenopharyngodon idellus</i> )
South	Ben Tre, Tien Giang, Long An, Hochiminh City, Dong Nai, Ba Ria - Vung Tau, Binh Thuan, Ca Mau, Bac Lieu, Soc Trang, An Giang, Can Tho, Dong Thap, Hau Giang, Kien Giang, Tra Vinh, Vinh Long	78	Black Tiger Shrimp ( <i>Penaeus monodon</i> ), Giant prawn ( <i>Macrobrachium rosenbergii</i> ), White shrimp ( <i>Penaeus vannamei</i> ), Crab ( <i>Scylla serrata</i> ), catfish ( <i>Pangasius hypophthalmus</i> ), Tilapia ( <i>Oreochromis spp</i> ), Climbing perch ( <i>Anabas testudineus</i> ), Snakehead ( <i>Ophiocephalus striatus</i> ), Feather back Fish ( <i>Notopterus notopterus</i> )
<b>Total</b>	<b>35 provinces/cities</b>	<b>163</b>	

## 2.2. Sampled species

Under the Monitoring Program 2011, samples have 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 analysed are described in the Table 2.

**Table 2:** Species samples in 2011

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, paracides): Trichlofon, Praziquantel; Trifluralin is tested together with B2a group.
- B3a group (Organochlorine compounds): 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; Crystal Violet/Leucocrystal Violet.

## 3. Sampling and testing

### 3.1. Sampling

In 2011, 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 Regional Authority) amended monthly sampling plan to be appropriate to current local context.

Sampling activities carried out in 2011 by regions covered by NAFIQAD Headquarter, NAFIQAD CRA and NAFIQAD SRA are showed in Table 3.

**Table 3: Sampling activities in 2011**

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 ( <i>Pangasius hypophthalmus</i> )	0	0	9	9	1,264	1,256	1,273	1,265	8
Tilapia ( <i>Oreochromis spp.</i> )	73	54	18	18	26	26	117	98	19
Climbing perch ( <i>Anabas testudineus</i> )	0	0	0	0	42	45	42	45	-3
Snakehead ( <i>Ophiocephalus striatus</i> )	0	0	0	0	36	34	36	34	2
Four-Eyes Sleeper ( <i>Bostrichthys sinensis</i> Lacepede)	7	7	0	0	0	0	7	7	0
Grass Carp ( <i>Ctenopharyngodon idellus</i> )	0	0	6	6	0	0	6	6	0
Featherback fish ( <i>Notopterus notopterus</i> )	0	0	0	0	20	20	20	20	0
Black Tiger shrimps ( <i>Penaeus monodon</i> )	94	84	81	81	822	780	997	945	52
White shrimps ( <i>Penaeus vannamei</i> )	140	123	400	400	210	208	750	731	19
Giants Prawn ( <i>Macrobrachium rosenbergii</i> )	0	0	0	0	26	24	26	24	2
Crab ( <i>Scylla serrata</i> )	15	13	0	0	0	0	15	13	2
Raw materials at middlemen	19	13	52	52	80	76	151	141	10
Fish breeds/hatchery water at shrimps farm	18	15	47	47	143	140	208	202	6
<b>TOTAL</b>	<b>366</b>	<b>309</b>	<b>613</b>	<b>613</b>	<b>2,669</b>	<b>2,609</b>	<b>3,648</b>	<b>3,531</b>	<b>117</b>

Under the Monitoring Program 2011, total of 3,531 samples were taken, in which 3,188 samples of aquaculture fish, 202 of juvenile fish and hatchery water and 141 of fish raw materials taken at middlemen, completing 96,8% of the Plan.

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...) in Central region.

### 3.2 Testing results

In 2011, number of violated samples was 32 over 3,531 analyzed samples ( $\approx 0,9\%$ ), less than the one in 2010, which was 57 over 4,075 ( $\approx 1,3\%$ ); Comparison in violated samples of 2010 and 2011 are as follows:

Groups	Year	Violated samples/total analyzed samples (%)	
		2010	2011
Group A1(Stilbens- salts and derivatives of stilbens)		0	0
Group A3 (Steroids)		0	0
A6 group (prohibited antibiotics)		0,93	0,87
B1 group (Anti-bacteria substances)		0,43	0,47
B2a group (Anti worm substances, paracides) and Trifluralin		3,25	0,88
B3a group (Organochlorine compounds)		0	0
Group B3c (Heavy metals)		0,52	0,46
Group B3d (Mycotoxins)		0	0
Group B3e (Dyes)		0,34	0

Testing results for harmful substances residues in 2011 are showed in Table 4.

**Table 4.** Testing results in 2011

Monitored groups	Monitored substances	Testing methods	Analysis		MRLs (ppb)	Number of unsatisfactory samples
			Plan	De facto		
<b>1. Aquaculture fish</b>						
<b>A1. STILBENES</b>	Diethylstilbestrol	LC/MS/MS	<b>70</b>	<b>72</b>	ND	00
<b>A3. Steroids</b>	Methyltestosterone	LC/MS/MS	<b>72</b>	<b>74</b>		00
<b>A6. Chloramphenicol</b>	Chloramphenicol	LC/MS/MS	<b>517</b>	<b>511</b>		<b>01</b>
<b>A6.NITROFURANS</b>		LC/MS/MS	<b>547</b>	<b>526</b>		
<b>Nitrofurantoin</b>	AOZ	LC/MS/MS	547	526	ND	<b>01</b>
<b>Furaltadone</b>	AMAZ	LC/MS/MS	547	526		00
<b>Furazolidone</b>	AHD	LC/MS/MS	547	526		<b>04</b>
<b>Nitrofurazone</b>	SEM	LC/MS/MS	547	526		<b>03</b>

Monitored groups	Monitored substances	Testing methods	Analysis		MRLs (ppb)	Number of unsatisfactory samples
			Plan	De facto		
<b>B1. Antibiotics</b> Screening methods	TETRACYCLINES SULFONAMIDES QUINOLONES	ELISA	0	0	0	0
<b>B1. Antibiotics</b> Confirmation method	<b>TETRACYCLINES</b>	LC/MS/MS	<b>153</b>	<b>149</b>		
	Chlotetracycline	LC/MS/MS	56	56	100	00
	Oxytetracycline		153	149	100	01
	Tetracycline		153	149	100	00
	<b>SULFONAMIDES</b>	LC/MS/MS	422	404	100	
	Sulfadimethoxine	LC/MS/MS	422	404	100	00
	Sulfachloropiridazine		422	404		00
	Sulfamethoxazole		422	404		00
	Sulfamethazine (Sulfadimidine)		422	404		00
	Sulfadiazine		422	404		00
	<b>QUINOLONES</b>	LC/MS/MS	<b>458</b>	<b>443</b>		
	Ciprofloxacin/ Enrofloxacin	LC/MS/MS	458	443	100	05
			458	443		
	Flumequine		458	443	600 for fish, 200 for shrimps and crabs	00
	Difloxacin		62	62	300	00
	Sarafloxacin		458	443	30	00
	Oxolinic acid		144	144	100	00
	Danofloxacin		62	62	100	00
	<b>Florfenicol</b>	LC/MS/MS	<b>100</b>	<b>100</b>	1000	00
	<b>Trimethoprim</b>	LC/MS/MS	<b>184</b>	<b>172</b>	50	00
<b>B2a. Anti worm substances, parasiticides</b>	Trichlofon (Dipterex)	GC/MS & LC/MS/MS	<b>117</b>	<b>106</b>	ND	00
	Praziquantel	GC/MS	<b>481</b>	<b>456</b>		00
	<b>Trifluralin</b>	GC/MS	<b>481</b>	<b>456</b>		09
<b>B3a. Organochlorine compounds</b>	Aldrine	GC - ECD	219	211	200	00
	Dieldrine	GC - ECD	219	211	200	00
	Endrine		219	211	50	00
	Heptachlor		219	211	200	00
	DDT		219	211	1000	00
	Chlordane		219	211	50	00
	Hexachorobenzen		219	211	200	00
	Lindane		219	211	1000	00
<b>B3c. Heavy metals</b>	Hg	AAS	220	217	500	00
	Cd		220	219	50 for fish, 500 for shrimps	01
	Pb		220	217	300 for	

Monitored groups	Monitored substances	Testing methods	Analysis		MRLs (ppb)	Number of unsatisfactory samples
			Plan	De facto		
					fish, 500 for shrimps	
<b>B3d. Mycotoxins</b>	Aflatoxine	HPLC	<b>140</b>	<b>131</b>	4	00
<b>B3e. Dyes</b>	Malachite Green/Leucomalachite Green	LC/MS/MS	271	255	ND	00
	Crystal Violet/Leucocrytal Violet	LC/MS/MS	109	104		00
<b>2. Raw materials at middlemen</b>						
<b>A6. Chloramphenicol</b>	Chloramphenicol	LC/MS/MS	<b>151</b>	<b>141</b>	ND	
<b>3. Hatchery water</b>						
<b>A6. Chloramphenicol</b>	Chloramphenicol	LC/MS/MS	<b>207</b>	<b>202</b>	ND	<b>08</b>

### 3.2.1. For fish samples collected at farms

- *Diethylstilbestrol* (group A1) residues were not detected in 72 analysis; *Methyltestosterone* (group A3) were not detected in 74 analysis of farmed fish. As previous years, these results showed no abuse of hormones or growth stimulators in aquaculture industry in Vietnam.

- Prohibited antibiotics (Group A6):

+ Among 511 analysis, 01 sample of commercial-sized black tiger shrimps (0.2%) were detected with *Chloramphenicol* residue of 0,52 ppb;

+ *Nitrofurans* were detected in 04 samples of aquaculture fish / 526 analysis (0,76%) (a reduction of 53% in comparison with 2010: 11 violated samples / 768 analysis), of which 01 commercial-sized catfish with AOZ and AHD residues level of 0,22 ppb and 6,52 ppb, 03 commercialized-sized black tiger shrimps with AHD and SEM residues level of 1,33ppb and 5,31 ppb.

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 has to be intensively controlled in 2012.

- Group B3e – Dyes: Malachite Green was not detected in farmed fish. This no-detection and monitoring results of previous years showed that the farmer's awareness in the use of Malachite Green 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 among 104 analyses.

- For restricted antibiotics (group B1):

+ *Oxytetracycline* residue level of 356 ppb was detected in 01 white shrimp sample /149 analysis for Tetracycline group (accounting for 0,67 %). Residues of this group had not been found between the years 2006-2010.

+ Sulfonamide residues exceeding permitted MRLs was not found (positive sign in comparison with the year 2010 of which 2 violated samples/577 analysis was detected, accounting for 0,35 %).

+ 29 farmed fish samples were found with *Enrofloxacin/Ciprofloxacin* residues levels of 1,07 ppb and 1.727,74 ppb, of which 05 samples (including 03 commercialized-size catfish, 01 black tiger shrimp and 01 tilapia) over 443 analyses for *Quinolones* (representing for 1,13%) were exceeding EU MRLs (total residues of *Enrofloxacin* and *Ciprofloxacin* do not exceed 100ppb), from 178,9 ppb to 1.727,74 ppb; an increase of 66% in comparison with 2010 (04 violated samples / 581 analysis, accounting for 0.68%).

+ *Trimethoprim* residues exceeding MRLs were not detected in 172 analysis.

+ *Florfenicol* residues exceeding MRLs were not found in 100 analysis.

All above mentioned results showed that there is still the abuse of antibiotics groups B1 (especially *Enrofloxacin/Ciprofloxacin* – *Quinolones* group) for fishery disease treatment. Therefore, in 2012, these criteria need to be strictly controlled, parallelly with the enforcement of the Circular No. 03/2012/TT-BNNPTNT dated January 16, 2012 on the adding of *Enrofloxacin* to the list of chemicals and antibiotics banned for use in fishery production and trading.

- There was no detection of anti worm substances and parasiticides (B2a group) *Trichlorfon (Dipterex)* in 286 analysis, of *Praziquantel* in 456 fish farmed analysis.

+ *Trifluralin* was detected in 9 samples (including 07 commercial-sized catfish, 01 black tier shrimp and 01 climbing perch) over 456 analysis (9,9%) with detection levels from 1,5ppb to 265,69ppb (accounting for 1,97%, a deduction of 80,1%in comparison with 2010: 22 samples/222 analysis – 9,9%). Monitoring results showed that in spite of the 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 2010. Therefore, in 2012, 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 2012.

- For environment contaminants:

+ There was no detection of Organochlorine compounds residues (Group B3a) in 211 analysis.

+ For heavy metal residues (Group B3c): 01 white shrimp sample / 217 analysis (0,46%) was found with Cadimi residues of 580ppb, which was exceeding MRLs

- No *Aflatoxin* (B1) was detected in 131 analysis.

### **3.2.2. For fish samples collected at middlemen**

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



### 3.2.3. For juvenile fish and shrimp hatchery water samples

08 shrimp hatchery water samples / 202 analysis (3,96%) were found with *Chloramphenicol* residue levels of from 0,26 ppb to 3,76ppb, a decrease of 43,3% in comparison with 2010: 10 violated samples/143 analysis – 6,99%. These results reflect the ongoing abuse of *Chloramphenicol*, but with a decreasing tendency in comparison with the years 2009 and 2010.

## 3.3. Actions taken against violations

### 3.3.1. For farmed 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 harmfulness of using banned chemicals and antibiotics to farmers.

#### b. Violations related to *Tetracycline*, *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 *Cd* 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 farming 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

### PLAN 2012 - RESIDUES MONITORING PROGRAM FOR CERTAIN HARMFUL SUBSTANCES IN AQUACULTURE FISH

Based on monitoring results of 2011 and survey results on current aquaculture status, the Monitoring plan 2012 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;
- Samples of raw materials at middlemen for verification of the use of banned chemicals, antibiotics in fishery preservation;
- No sampling of veterinary drugs and aquatic feeds to test for banned chemicals and antibiotics residues. This activity will be carried out by relevant Departments in charge of veterinary drugs and feeds 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 2012, following species and subjects will be sampled:

Species:

- Tra catfish (*Pangasius hypophthalmus*)
- Tilapia (*Oreochromis spp*)
- Climbing perch (*Anabas testudineus*)
- Feather back fish (*Notopterus notopterus*)
- Four-eyed sleeper (*Bostrichthys sinensis Lacepede*)
- Snakehead (*Ophiocephalus striatus*)
- Grass carp (*Ctenopharyngodon idellus*)
- Black tiger shrimps (*Penaeus monodon*)
- White shrimp (*Penaeus vannamei*)
- Giant prawn (*Macrobrachium rosenbergii*)
- Crab (*Scylla serrata*)

Subjects:

- Hatcheries
- Middlemen

#### 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 2012 are designated as follows:

**Table 5: Testing groups in 2012**

No.	Substrates	Designated testing groups
1	Extensive aquaculture fish	<ul style="list-style-type: none"> <li>- B3a: Organochlorine compounds, including Lindan, HCB, Heptachlor, Aldrin, Dieldrin, Endrin, DDT, Chlordane</li> <li>- B3c: Pb, Hg, Cd</li> </ul>
2	Intensive aquaculture fish	<ul style="list-style-type: none"> <li>- A6: Chloramphenicol and Nitrofurans (AOZ (3-amino-2 oxazolidinone); AMOZ (3- amino - 5 morfolinomethyl-1,3 oxazolidin-one); AHD (1-aminohydantoin); SEM - Semicarbazide).</li> <li>- B1: Tetracyclines group (Oxytetracycline, Tetracycline), Sulfonamides (Sulfadiazine, Sulfadimidine (Sulfamethazine), Sulfamethoxazole, Sulfadimethoxine, Sulfachlorpyridazine), Quinolones group (Sarafloxacin, Ciprofloxacin, Enrofloxacin, Flumequin), Trimethoprim, Florfenicol.</li> <li>- B2a and Trifluralin: Praziquantel; Trifluralin.</li> <li>- B3a: Organochlorine compounds, including Lindan HCB, Heptachlo, Aldrin, Dieldrin, Endrin, DDT, Chlordane</li> <li>- B3c: Pb, Hg, Cd</li> <li>- B3d: Aflatoxin (B1)</li> <li>- B3e: Malachite Green/Leuco Malachite Green</li> </ul> <p>For farmed fish, following additional tests are required:</p> <ul style="list-style-type: none"> <li>- A1: Diethylstilbestrol</li> <li>- A3: Methyltestosterone</li> </ul>
3	Hatchery waters	- A6: CAP
4	Raw materials at middlemen	- A6: CAP

### 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. an actual The low sampling rate is applied due to the super-intensive farming with a productivity of 300-500 ton/ha. 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 2012 are showed in Table 6.

**Table 6:** Number of samples to be taken by species

No.	Farmed fish / Others species	Estimated production in 2012 categorized by farming methods			Number of samples to be taken
		Intensive farming (ton)	Extensive farming (ton)	Total production (ton)	
1	Tra catfish	767,366	-	767,366	1,539
2	Tilapia	38,468	-	38,468	162
3	Climbing perch	14,750	-	14,750	52
4	Snakehead	5,845	-	5,845	58
5	Feather back fish	2,900	-	2,900	29
6	Four-eyed sleeper	800	-	800	5
7	Grass carp	580	-	580	5
8	Black tiger shrimp	148,904	126,261	275,165	1,430
9	White shrimp	154,679	-	154,679	953
10	Giant prawn	2,263	-	2,263	23
11	Crab	1,835	-	1,835	18
12	Raw materials at middlemen	-	-	-	166
13	Juvenile catfish	-	-	-	139

14	Hatchery water	<b>1,118,390</b>	<b>126,261</b>	<b>1,244,651</b>	<b>4,579</b>
	<b>Total</b>	767,366	-	767,366	<b>1,539</b>

#### **4. Sampling plan and criteria to be tested by groups**

- Intensifying the sampling of farmed fish for CAP and NTRs.
- Intensifying to test farmed fish for Enrofloxacin/Ciprofloxacin – Quinolones residues.
- Reducing number of follow-up samples for Tetracyclines, B3d, B3e, 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.

**Table 7: Sampling plan for 2012**

No.	Substrates	Samples to be taken	Number of samples to be analysed upon testing groups											
			A6			B1				B2a and Trifluralin	B3a	B3c	B3d	B3e
			A1	A3	CAP	NF	TC	Sul	Qui	Flor	Trime			
1	Tra catfish	1,539	47	46	250	228	64	182	189	64	65	59	74	106
2	Tilapia	162	10	11	28	23	6	17	22	8	7	12	5	12
3	Climbing perch	52	1	1	11	8	2	6	6	2	2	2	2	4
4	Snakehead	58	3	3	8	8	3	4	6	3	3	3	3	4
5	Feather back fish	29	1	1	5	4	1	3	4	1	1	2	1	1
6	Four-eyed sleeper	5	0	0	2	1	0	1	1	0	1	1	0	1
7	Grass carp	5	1	1	1	0	1	0	1	1	0	2	0	0
8	Black tiger shrimp	1,430	0	0	284	278	55	190	211	54	59	74	62	60
9	White shrimp	953	0	0	155	188	35	118	165	13	51	66	29	71
10	Giant prawn	23	0	0	4	5	1	1	3	1	1	3	1	1
11	Crab	18	0	0	3	5	0	3	3	0	1	3	1	3
12	Raw materials	166	0	0	169	0	0	0	0	0	0	0	0	0
13	Hatchery water	139	0	0	139	0	0	0	0	0	0	0	0	0
	<b>Total</b>	<b>4,579</b>	<b>63</b>	<b>63</b>	<b>1,059</b>	<b>748</b>	<b>168</b>	<b>525</b>	<b>611</b>	<b>147</b>	<b>191</b>	<b>227</b>	<b>178</b>	<b>263</b>

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

## 5. Testing plan by groups

(please see Annex I)

### PART III CONCLUSION

The residues monitoring program for certain harmful substances in aquaculture fish 2011 was set up and implemented in accordance with the regulations promulgated by the Decision No. 130/2008/QĐ-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.

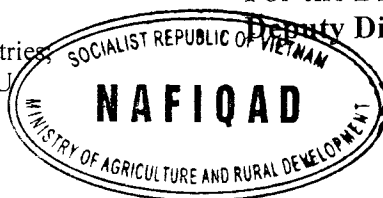
The setting up of the Plan 2012 is based upon EC relevant legislation documents/guidance on the establishment of the Third Country Residue Monitoring Program, implementation results of the program 2011 as well as notifications of importing countries. This Plan can be modified in accordance with monthly reports on aquaculture status, disease situation and the use of veterinary drugs, feeds, chemicals and probiotics in aquaculture industry in Vietnam.

Cc:

- European Commission;
- Competent authorities of EU member countries;
- Vietnam Embassies and Trade offices in EU member countries;
- EC Delegation to Vietnam.

**For the Director General**

**Deputy Director General**



**Tran Bich Nga**



# Annex: TESTING PLAN BY GROUP

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)	Laboratory	
A1	63	Diethylstilbestrol	Fish meat	-	LC/MS/MS (RIVM method, in-house method)	-	0.5	ND	NAFI 4,6	
				ELISA (kits instruction manual)		0.5	-		NAFI 6	
A3	63	Methyltestosterone	Fish meat	-	LC/MS/MS (RIVM method, in-house method)	-	0.2-0.5	ND	NAFI 4,6	
A6	1.857	Chloramphenicol + Nitrofurans						ND		
A6	1.059	Chloramphenicol	Fish meat, hatchery water	ELISA (kits instruction manual)	-	0.2 -0.3		ND	NAFI 1,2,4,5,6	
			Fish meat, hatchery water	-	LC/MS/MS (in-house method)	-	0.1		NAFI 2,3,4,5,6	
	747	Nitrofurans						ND		
	747	Furalfadone metabolite	Fish meat	-	LC/MS/MS (Rikilt-Dutch, in-house method)	-	0.1-0.5		NAFI 1,2,3,4,5,6	
	747	Furazolidone metabolite								
	747	Nitrofurantoin metabolite					0.3-1.0		NAFI 2,4,5,6	
	747	Nitrofurazone metabolite								
B1	168	Tetracycline	Fish meat	-	LC/MS/MS (in-house method)	-	10 -20	100	NAFI 1,2,3,4,5,	
							10-20			

Group of substances	No. of analysis	Substance	Matrices	Screening method	Confirmatory method	LOD by screening method (ppb)	LOD by confirmatory method (ppb)	MRLs (ppb)	Laboratory	
Quinolones	611	Ciprofloxacin	Fish meat	ELISA (kits instruction manual)	HPLC-FLD, LC/MS/MS (in-house method, FDA, Journal of food and drug analysis, Vol. II, No 2, 2003, page 114-127)	5-10	2-10	100	NAFI 1,2,3,4,5,6	
		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					525	Sulfadiazine		Fish meat
Sulfathiazole										
Sulfadimidine										
Sulfamethoxazole										
Sulfadimethoxine										
Sulfachlorpyridazine										
Trimethoprim	191	Trimethoprim	Fish meat	-	HPLC-PDA, LC-MS/MS (in-house method, <i>Journal of chromatography A</i> , 898 (2000) 95-102)	-	10 - 20	50	NAFI 1,2,3,4,5,6	
Florfenicol	147	Florfenicol	Fish meat	-	LC/MS/MS (in-house method)	-	0.1	1000	NAFI 1,2,3,4,5,6	
Anthelmintics	416	Praziquantel	Fish meat	-	LC/MS/MS (in-house method)	-	-	-	NAFI 4	
				HPLC/UV		20	-		NAFI 6	
Trifluralin	416	Trifluralin	Fish meat	-	GC/MS (AOAC)	-	1.0	100	NAFI 2,3,4,5,6	

Group of substances	No. of analysis	Substance	Matrices	Screening method	Confirmatory method	LOD by screening method (ppb)	LOD by confirmatory method (ppb)	MRLs (ppb)	Laboratory
					2007.01, in-house method)				4,5, 6
<b>B3a+B3c+B3d + B3e</b>	897								
<b>B3a</b>	227	Organochlorine compounds including PCBs	Fish meat		GC-ECD (AOAC 2007.01)		0.7 - 5	200	NAFI 4
								200	
								50	
								200	
								1000	
								50	
								200	
								1000	
								200	
								200	
								50	
								200	
								1000	
<b>B3c</b>	229	Chemical elements	Fish meat	-	GC-ECD/GC-MS (AOAC 983.21)	-		200	NAFI 6
								200	
								50	
								200	
								200	
								1000	
								300 for fish, 500 for shrimps	
								500	
								50 for fish, 500 for shrimps	
								5	
								25	
								10	
								5	

Group of substances	No. of analysis	Substance	Matrices	Screening method	Confirmatory method	LOD by screening method (ppb)	LOD by confirmatory method (ppb)	MRLs (ppb)	Laboratory
B3d Mycotoxins	178	Aflatoxine (B1)			HPLC (AOAC edition 1997, Volume II, chapter 49, page 18-19, in-house method)		0.3-1	4	NAFI 1, 2, 5, 6
B3e Dyes	263	Malachite Green/ Leucomalachite Green	Fish meat	-	LC/MS/MS (AOAC international Vol.78, No.6, 1995, Journal AOAC International Vol.88, No.3, 2005)	-	0.5	ND	NAFI 1, 2, 3, 4, 6
				-		-	1.0		NAFI 5