MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT NATIONAL AGRO-FORESTRY-FISHERIES QUALITY ASSURANCE DEPARTMENT

REPORT

The Residues Monitoring Program for Certain Harmful Substances in aquaculture fish and products thereof in 2009

and

Implementation Plan in 2010

Hanoi, March 2010

PART I

RESULTS OF THE MONITORING PROGRAM FOR CERTAIN HARMFUL SUBSTANCES RESIDUES IN 2009

1. General

The Program for control of residues in farmed fish has been implemented with allocated budget and plan approved by the Ministry of Agriculture and Rural Development (by Decision No. 1543/QD-BNN-TC of 2 June 2009 approving estimated expenditure of National Target Program for Food Hygiene and Safety 2009). 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 Manual for control of residues as well as relevant guidances published by the National Agro-Forestry-Fisheries Quality Assurance Department (NAFIQAD), which are also in compliance with EC regulations.

The Program was considered to be in line with EU requirements by the FVO inspection team to Vietnam during 19-29 October 2009, reflecting effective controls of residues in aquaculture fish in Vietnam.

2. Monitored scope and species

Branch	Participating provinces	No. of aqua. areas	Aquaculture species
NAFIQAD Branch 1	Quang Ninh, Hai Phong, Thai Binh, Nam Dinh, Ninh Binh, Thanh Hoa, Nghe An, Ha Tinh	31	Black tiger shrimp (Penaeus monodon), white shrimp (Penaeus Vannamei), tilapia (Oreochromis spp)
NAFIQAD Branch 2	Quang Binh, Quang Tri, Thua Thien Hue, Da Nang, Quang Nam, Quang Ngai, Binh Dinh, Kon Tum	37	Black tiger shrimp (Penaeus monodon), white shrimp (Penaeus Vannamei), catfish (Pangasius hypophthalmus), tilapia (Oreochromis spp)
NAFIQAD Branch 3	Phu Yen, Khanh Hoa, Ninh Thuan	10	Black tiger shrimp (Penaeus monodon), white shrimp (Penaeus Vannamei)
NAFIQAD Branch 4	Ben Tre, Tien Giang, Long An, Hochiminh City, Dong Nai, Ba Ria - Vung Tau, Binh Thuan	32	Black tiger shrimp (Penaeus monodon), giant prawn (Macrobrachium rosenbergii), white shrimp (Penaeus Vannamei), crab (Scylla serrata), catfish (Pangasius hypophthalmus)
NAFIQAD Branch 5	Ca Mau, Bac Lieu, Soc Trang	15	Black tiger shrimp (Penaeus monodon), catfish (Pangasius hypophthalmus)

Table 1:Scope of the Monitoring Program

NAFIQAD Branch 6	An Giang, Can Tho, Dong Thap, Hau Giang, Kien Giang, Tra Vinh, Vinh Long	26	Catfish (Pangasius hypophthalmus), tilapia (Oreochromis spp), black tiger shrimp (Penaeus monodon), giant prawn (Macrobrachium rosenbergii)
Total	36 provinces/cities	151	

2.2. Sampled species

Under the Program 2009, samples have been taken at all stages of production chain: from hatchery to commercial size farming stage. Certain samples of fishery veterinary drugs and feeds have also been taken for surveillance. Details of sampling at each stage and groups to be analysed are described in the Table 2.

Table 2:	Sampled	species
----------	---------	---------

No.	Production stage	Samples taken	Testing parameters
1	Hatchery	Hatchery water	САР
2	Aquaculture site	Fish farmed at all stages	A1, A3, A6, B1, B2a, B3a, B3c, B3d, B3e
3	Feeds seller	Feeds	A6, B3d
4	Seller of veterinary drugs and chemicals	Veterinary drugs	A6
5	Middleman	Fishery raw materials	САР

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, Flofenicol.
- B2a group (Anti worm substances, paracides): Trichlofon (Dipterex)
- B3a group (Organochlorinated pesticides group): HCB, Lindane, Heptachlor, Aldrin, Dieldrin, Eldrin, Chlordan, DDT
- B3c group (heavy metals): Pb, Cd, Hg, As
- B3d group (Toxic fungus): Aflatoxin
- B3e group (Dyes): Malachite Green/Leucomalachite Green; Crystal Violet/Leucocrystal Violet.

3. Sampling and testing

3.1. Sampling

- In 2009, the sampling was carried out by the local competent authorities in compliance with the plan approved by the Ministry of Agriculture and Rural Development (Decision No. 1543/QD-BNN-TC of 2 June 2009 approving estimated expenditure of National Target

Program for Food Hygiene and Safety 2009). However, following monthly reports on current aquaculture from local competent authorities, NAFIQAD Branches modified monthly sampling plan on types of sample, testing parameters and number of samples to be taken to be complaint with current situation in locals. Therefore, there was a slight difference between the Plan and the implementation.

Sampling activities carried out in 2009 in NAFIQAD Branches are showed in Table 3.

Table 3: Sampling activities

NAFIOAD				Sam	ples ta	ken up	on tes	ting gr	oup/pa	ramet	er			B3c			B.	3e
Bra	anch	Samples	A1	A3	A	.6			B1		1	B2a	B3a	Hg, Cd,	As	B3d	MG	CV
		taken		110	CAP	NF	TC	Sul	Qui	Trim	Flo	DZu	Dou	Pb	110		mo	
1	Plan	261	2	2	118	90	17	45	44	5	1	8	22	25	0	22	11	11
	Imple	263	2	2	115	93	19	43	47	5	1	9	20	23	0	23	11	11
2	Plan	347	3	3	149	126	36	52	51	7	1	18	22	23	0	35	19	19
	Imple	352	3	3	151	127	31	50	50	7	1	16	23	22	1	40	19	18
2	Plan	226	0	0	130	87	25	46	50	8	0	7	10	9	0	29	12	12
3	Imple	226	0	0	130	87	25	47	49	8	0	6	10	9	0	29	12	12
4	Plan	974	15	15	365	328	82	196	204	39	19	67	70	62	0	71	80	75
4	Imple	934	13	15	366	318	78	185	193	35	18	64	63	58	14	60	80	72
5	Plan	718	10	10	337	275	53	193	193	22	19	29	17	17	0	81	41	40
5	Imple	674	9	9	321	262	50	182	182	20	15	27	17	18	5	76	38	28
(Plan	1,596	28	27	340	316	57	187	187	68	40	80	52	52	0	74	221	165
0	Imple	1,541	24	24	327	297	55	190	181	40	66	76	51	51	37	78	204	152
Tatal	Plan	4,122	58	57	1,439	1,222	270	719	729	149	80	209	193	188	0	312	384	322
Total	Imple	3,990	51	53	1,410	1,184	258	697	702	141	75	198	184	181	57	306	364	293

Note: CAP - Chloramphenicol; NF - Nitrofurans; TC - Tetracyclines; Sul - Sulfonamides; Qui - Quinolones; Trim – Trimethoprim; Flo – Flofenicol; Hg - Mercury, Cd – Cadmium; Pb – Lead; As – Arsen; MG: Malachite Green/ Leucomalachite Green; CV - Crystal Violet/Leucocrytal Violet.

Within the Residues Monitoring Program 2009, total of 3,990 samples were taken, in which 3,455 samples of aquaculture fish, 150 of veterinary drugs, 172 of feeds, 97 of hatchery water and 116 of fish raw materials taken at middlemen, completing 96,8% of the Plan.

The above table shows that sampling by NAFIQAD Branches is fairly in line with the Plan. However, the implementation is still insignificantly different from the Plan because NAFIQAD Branches has amended sampling plan to fit actual farming (based on monthly monitoring reports).

The number of taken samples is actually lower than the planned due to the impacts of storms and flood in the Central Vietnam; epidemic outbreak in some aquaculture areas causing death of fish species and no sampling; and changes of harvest time in some aquaculture sites (earlier harvest to avoid flood).

3.2 Testing results

Testing results for harmful substances residues in 2009 are showed in the Annex 4.

Tested groups	Tested substances	Num test	ber of ings	MRLs	Number of unsatisfact	
- contra Browko		Plan	umber of testings MRLs (ppb) an Imple. MRLs (ppb) i8 51 ND i7 53 ND i0 887 ND i0 887 ND i07 883 ND i07 258 100 i00 258 100 i00 258 100	ory samples		
1. Aquacultured fish						
A1. STILBENES	Diethylstilbestrol	58	51	ND	00	
A3. Steroids	Methyltestosterone	57	53	ND	00	
A6.CHLORAMPHENICOL	Chloramphenicol	900	887	ND	05	
A6.NITROFURANS		907	883			
Nitrofurantoin	AOZ	907	883	ND		
Furaltadone	AMOZ	907	883	ND	00	
Furazolidone	AHD	907	883	ND	00	
Nitrofurazone	SEM	907	888	ND	07	
	TETRACYCLINES	270	258			
R1 Other antibiotics	Chlotetracycline	270	258	100	00	
	Oxytetracycline	270	258	100	00	
	Tetracycline	270	258	100	00	

Table 4. Testing results

Tested groups	Tested substances	Num test	ber of ings	MRLs	Number of unsatisfact
- contra Broaks		Plan	Imple.	(ppb)	ory samples
	SULFONAMIDES	719	697		
	Sulfadimethoxine	719	697	100	00
	Sulfachloropiridazine	719	697	100	02
	Sulfamethoxazole	719	697	100	01
	Sunfamethazine (Sunfadimidine)	719	697	100	00
	Sunfadiazine	719	697	100	
	QUINOLONES	729	702		
	Ciprofloxacin/	729	702	100	03
	Enrofloxacin	729	702	100	05
	Flumequin	729	702	600 in fish, 200 in crab, prawn	00
	Difloxacin	729	702	300	00
	Sarafloxacin	729	702	30	00
	Oxolinic acid	729	702	100	00
	Danofloxacine	729	702	100	00
	Flofenicol	80	75	1000	00
	Trimethoprim	149	141	100	00
B2a. Anti worm substances, parasiticides	Trichlofon (Dipterex)	209	198	ND	00
		193	184		00
	Aldrine	193	184	200	00
	Dieldrine	193	184	200	00
	Endrine	193	184	50	00
B3a. Organochlorinated pesticides group	Heptachlor	193	184	200	00
	DDT	193	184	1000	00
	Chlordane	193	184	50	00
	Hexachorobenzen	193	184	200	00
	Lindane	193	184	1000	00

Tested groups	Tested substances	Num test	ber of ings	MRLs	Number of unsatisfact	
		Plan	Imple.	(ppb)	ory samples	
		188	181		00	
	Hg	188	181	500	00	
B3c. Heavy metals	Cd	188	181	50 in fish, 500 in shrimp	00	
	Pb	188	181	200 in fish, 500 in shrimp	00	
	As	0	57	2000	00	
B3d. Fungal toxin	Aflatoxine	152	140	4	00	
D2a Drug	Malachite Green/ Leucomalachite Green	384	364	ND	00	
bse. Dyes	Crystal Violet/ Leucocrytal Violet	322	293	ND	00	
2. Fishery raw materials at middleman						
A6. CHLORAMPHENICOL	Chloramphenicol	120	116	ND	00	
3. Veterinary drugs						
A6. CHLORAMPHENICOL	Chloramphenicol	155	150	ND	00	
A6. NITROFURANS	Furazolidone	155	147	ND	00	
4. Feeds						
A6. CHLORAMPHENICOL	Chloramphenicol	160	160	ND	00	
A6. NITROFURANS	Furazolidone	160	160	ND	01	
B3d. MYCOTOXINS	Aflatoxine	160	166	10	10	
5. Hatchery water						
A6. CHLORAMPHENICOL	Chloramphenicol	103	97	ND	02	

3.2.1. For fish samples collected from aquaculture sites

- DiethylStilbestrol (group A1) residues were not detected in 51 analysis; Methyltestosterone (group A3) were not detected in 53 analysis of tilapia and catfish samples. As last years, these results showed no abuse of hormones or growth stimulators in aquaculture industry in Vietnam. - Prohibited antibiotics (Group A6): 05 samples of tra catfish among 887 analysis (0,56%) were detected with Chloramphenicol residues of 0,41 - 2,01 ppb; 03 samples of giant prawn and 04 samples of soft shell crab / 888 analysis (0,79%) with SEM of 0,27 - 7,59 ppb. This demonstrated that certain farms still abused prohibited antibiotics in aquaculture.

- Malachite Green was not detected in 340 analysis. Together with the MG control results of recent years, this result reflects positive changes in farmers' awareness about no MG abuse in fish disease prevention and cure. In 2009, Crystal Violet (Gentian violet) was added to group B3e, but it was not detected in aquaculture fish among 293 analysis.

- For restricted antibiotics (group B1):

+ None among 258 analysis was detected with Tetracycline.

+ 02 tra catfish and 01 black tiger shrimp among 697 analysis (0,43%) were found with Sulfonamides exceeding the MRL.

+ 02 tra catfish and 01 black tiger shrimp among 702 analysis (0,43%) were found with Quinolones exceeding the MRL.

+ 02 tra catfish / 108 analysis (1,85%) were detected with Trimethoprim of 56 ppb and 105,5 ppb.

+ None among 115 analysis was detected with Trimethoprim and none among 101 analysis was detected with Florfenicol.

All above mentioned results demonstrated that there is still antibiotics (groups of Quinolones, Sulfonamides) abuse for fishery disease treatment (according to Circular of the Minister of Agriculture and Rual development No. 15/2009/TT-BNN dated 17 March 2009 promulgating the list of drugs, chemicals, antibiotics banned/restricted to use), however violations have decreased in comparison with those in 2008. Therefore, it is required to strictly control the use of these groups in 2010.

- There was no detection of anti worm substances and parasiticides (B2a group) in 198 analysis.

- For environment contaminants: Among 184 analysis, there was no detection of organochlorinated substances residues (Group B3a); among 181 analysis, none found with heavy metal residues (Group B3c).

- No Aflatoxin was detected in 140 analysis.

3.2.2. For fish samples collected at middlemen

Among 121 analysis, none was detected with Chloramphenicol residues. This showed that the abuse of banned antibiotics in fishery preservating was effectively controlled.

3.2.3. For veterinary drugs, feed and hatchery water samples

- For veterinary drugs samples: all results of 147 analysis were satisfactory, there was no detection of Chloramphenicol and Furazolidone residues in veterinary drugs samples.

- For feed samples: Chloramphenicol residues were not detected in any feed samples; one among 160 analysis (0,6%) was detected with Furazolidone residues; 10 feed samples / 166 analysis were contaminated with Aflatoxin (B1) exceeding the MRL with the detection values from 10 ppb - 94,2 ppb. The above mentioned results demonstrated that feed preservation at some middlemen and farmers was not carried out well and in accordance with techniques, therefore Aflatoxin (B1) was formed in feed samples.

- For hatchery water samples: Analysis results showed that 2 hatchery water samples / 97 analysis (2,06%) were found with Chloramphenicol residues of 0,03 ppb and 56,89 ppb. These results reflect that the Chloramphenicol abuse in breeding production stage has significantly decreased.

3.3. Actions taken against violations

3.3.1. For farmed fish

- a. Violations related to Chloramphenicol, SEM contaminations
- Requesting to suspend the harvesting in contaminated aquaculture sites, apply relaying regime / surveillance;
- Requesting processors not to purchase raw materials from aquaculture sites contaminated with chemical, banned antibiotics residues;
- 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 propaganda on harmfulness of using banned chemicals and antibiotics to farmers.
- b. Sulfonamides, Quinolones, Trimethoprim residues exceeding the MRLs
- Requesting 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.

3.3.2. For Aflatoxin contaminated feeds

- Seizing and destroying contaminated feeds;
- Carrying out the investigation of contamination cause and intensifying the inspection of storage conditions of feed traders.
- Strenghtening communications to feed traders on hygiene conditions in feed storage.

3.3.3. For Furazolidone contaminated feeds

- Applying administrative sanctions against violations for middlemen providing the above contaminated feeds and carrying out traceback, recalling feeds from middlemen.
- Carrying out the investigation of contamination cause and recommending food business operators to comply with regulations on the use of banned chemicals, antibiotics in breed production and trade.

3.3.4. For hatchery water samples

- Carrying out the investigation of contamination cause. However, since shrimp breeds in two hatchery basins, where contaminated water samples were taken, died because of white spot disease, the farmers let the hatchery water out.
- Carrying out the sampling for verification in other hatchery basins of contaminated aquaculture site/hatchery, all results of samples testing were satisfactory.
- Strengthening propaganda on harmfulness of using banned chemicals and antibiotics to farmers, recommending hatchery farmers to check composition of drugs indicated on the label before purchase and use, do not use drugs containing banned substances or substances with unknown origin.

PART II

PLAN FOR MONITORING CERTAIN HARMFUL SUBSTANCES RESIDUES IN AQUACULTURE FISH IN 2010

Based on monitoring results of 2009 and survey results on current aquaculture status, the Monitoring plan 2010 has been set up as follows:

1. Species and subjects to be monitored:

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

- Aquacultured species having large production;

- Samples of raw materials at middlemen for verification the use of banned chemicals, antibiotics in fishery preservating;

- Do not carry out sampling for veterinary drugs and aquatic feeds to verify banned chemicals, antibiotics residues, this activity will be carried out by the specialized departments in charge of veterinary drugs and feeds.

b. In 2010, following species and subjects will be sampled:

- Giant prawn (*Macrobrachium rosenbergii*)
- Black Tiger Shrimps (Penaeus monodon)
- White shrimp (Penaeus vannamei)
- Tra Catfish (Pangasius hypophthalmus)
- Tilapia (Oreochromis spp)
- Climbing perch (Anabas testudineus)
- Mudfish (Ophiocephalus striatus)
- Crab (Scylla serrata)
- Shrimp and Fish hatchery waters
- Raw materials at middleman

2. Parameters to be analyzed

Following EU guidelines on the control planning of chemicals and antibiotics residues in aquaculture fish for third countries, results of previous years and feedback from importing markets and recommendations of EU inspection team in October 2009, testing groups in 2010 are designated as follows:

Table 5: Testing groups in 2010

No.	Substrates	Designated testing groups
1	Extensive aquaculture	- B3a: Organochlorinated pesticides, including
	animals	Lindan, HCB, Heptachlo, Aldrin, Diendrin, Endrin,

No.	Substrates	Designated testing groups
		DDT, Chlodance
		- B3c: Pb, Hg, Cd
2	Aquaculture animals	 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 (Chlotetracycline, Oxytetracycline, Tetracycline), Sulfonamides (Sulfadiazine, Sulfadimidine (Sulfamethazine), Sulfamethoxazole, Sulfadimethoxine, Sulfachlorpyridazine), Quinolones (Difloxacin, Sarafloxacine, Ciprofloxacine, Danofloxacine, Enrofloxacine, Flumequine, Oxolinic acid), Trimethoprim, Florfenicol B2a and Trifluralin: Trichlorfon (Dipterex), Praziquantel; Trifluralin. B3a: Organochlorinated pesticides, including Lindan HCB, Heptachlo, Aldrin, Diendrin, Endrin, DDT, Chlodance B3c: Pb, Hg, Cd B3d: Aflatoxin B3e: Malachite Green/Leuco Malachite Green; Crystal Violet/Leucocrytal Violet For farmed fish, it is required to carry out additional tests for: A1: Diethylstillbestrol A2: Mathedtactaturana
2	Fish and shrimn hatsharry	
5	waters	- AU. CAP
4	Raw materials at middleman	- A6: CAP

3. Sampling plan

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

- For intensive farmed shrimps: 2,313 samples over 234,782 tons of products (estimated), equivalent to the rate of 1/100 (sample/ton).

- For extensive farmed shrimps: this farming method is only applied in several provinces with large water surface and mangroes forest for aquaculture; farmers localize big tidy areas (over 5 ha) and use natural breeds. With big aquaculture areas and low stocking density, the use of feeds and veterinary drugs for fish disease prevention in this case is not efficient. Therefore, farmers applying this aquaculture method never feed and treat the fish with veterinary drugs. For this reason, for extensive farmed shrimps, 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: 1,540 samples over 857,663 tons, equivalent to the rate of 1/550 (sample/ton). 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.

	Formed fich / Others	Tentati categoriz	n in 2009 g methods	Samples	
No.	species	Intensive method (ton)	Extensive method (ton)	Total production (ton)	to be taken
1	Tra catfish (<i>Pangasius</i> hypophthalmus)	857,663	0	857,663	1,511
2	Tilapia (Oreochromis spp)	10,640	0	10,640	62
3	Climbing perch (Anabas testudineus)	35,000	0	35,000	24
4	Snakehead (<i>Ophiocephalus striatus</i>)	7,900	0	7,900	52
5	Black Tiger Shrimp (Penaeus monodon)	145,107	2,166	147,273	1,327
6	White shrimp (<i>Penaeus vannamei</i>)	85,855	0	85,855	833
7	Giant Prawn (Macrobrachium rosenbergii)	3,820	0	3,820	34
8	Crab (Scylla serrata)	2,100	0	2,100	22
9	Raw materials at middleman				142
10	Shrimp hatchery water				119
11	Tra catfish hatchery water				29
	Total	1,148,085	2,166	1,150,251	4,155

Table 6: Sampling plan based upon productivity

4. Sampling plan upon testing groups

Based on monitoring results of 2009, the samling plan 2010 will focus on:

- Intensifying the sampling of farmed fish for CAP and NTRs.

- Intensifying to test farmed fish for Sulfonamides and Quinolones residues.

- Reducing number of follow-up samples for B3d, Tetracylines, Florfenicol, Trimethoprim.

- Additionally testing for Trifluralin together with Group B2a.

- Adding Praziquantel to the Group B2a - Anti worm substances, parasiticides.

- Reducing number of samples for Crystal Violet/Leucocrystal Violet (for which farmed fish designated to test, not shrimp/crab).

Sampling plan and groups and parameters to be analyzed are showed in Table 7

Table 7: Sampling plan in 2010

		Samplag		Number of samples to be analysed upon testing groups															
No.	Substrates	to be	en A1		A6			B1				B2a and Trifluralin						B	3e
		taken		A3	CAP	NF	ТС	Sul	Qui	Flor	Trime	Trich	Prazi	Triflu	B3a	B3c	B3d	MG	CV
1	Tra catfish	1,511	49	51	208	208	51	200	199	61	56	120	62	62	58	58	48	169	169
2	Tilapia	62	5	5	8	8	5	9	8	4	4	5	3	3	4	4	4	5	5
3	Climbing perch	24	1	1	4	4	1	2	2	1	1	2	1	1	2	2	1	1	1
4	Snakehead	52	2	2	7	7	2	7	7	3	3	4	4	4	2	2	0	4	4
5	Black tiger	1,327	0	0	275	291	58	216	215	39	60	89	63	63	77	77	54	64	0
6	White shrimp	833	0	0	228	236	75	149	151	8	58	74	40	40	65	66	52	53	0
7	Giant prawn	34	0	0	9	10	1	7	6	1	1	4	3	3	0	0	2	1	0
8	Crab	22	0	0	7	7	1	4	4	1	2	2	1	1	2	1	1	3	0
9	Raw materials	142	0	0	134	0	0	0	1	0	0	0	0	0	0	0	0	0	0
10	Hatchery water	148	0	0	135		0	0	0	0	0	0	0	0	0	0	0	0	0
11	Total	4,155	57	59	1,015	771	194	594	593	118	185	300	177	177	210	210	162	300	179

Note: CAP - Chloramphenicol; NF - Nitrofurans; TC - Tetracyclines; Sul - Sulfonamides; Qui - Quinolones; Trime – Trimethoprim; Flo – Flofenicol; Trich: Trichlofon; Prazi: Praziquantel; Triflu: Trifluralin; MG: Malachite Green/Leucomalachite Green; CV: Gentian violet/Crystal Violet/Leucocrytal Violet.

5. Sampling plan upon parameters (Annex 1)

PART III

CONCLUSION

The report of FVO inspection mission in Vietnam in October 2009 showed that Vietnam residues monitoring program for certain harmful substance in aquaculture fish 2009 was set up and implemented in compliance with the Directive 96/23/EC of April 29, 1996 and other relevant documents.

The setting up of the Plan 2010 is based upon EC relevant legislation documents/guidances (updated until October 16, 2009) on the establishment of the Program for control of residues in third countries, implementation results of the program 2009 as well as recommendations by FVO inspection mission carried out in October 2009. This Plan could be amended in accordance with monthly reports on aquaculture status, disease situation and use of veterinary drugs, chemicals and probiotics in aquaculture 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: RESIDUE MONITORING PLAN

Group of substances		Numb er of analysi s	Substance	Matrices	Screening method	Confirmatory method	LOD by screeni ng method (ppb)	LOD by confirma tory method (ppb)	MRLs (ppb)	Labora tory	
A1	Stilbenes	57	Diethylstilbestrol	Meat of aquaculture products	-	LC/MS/MS (Rida method)	-	0.5	ND	NAFI 4	
A3	Steroids	59	Methyltestosterone	Meat of aquaculture products	-	LC/MS/MS (method of Wisconsin-Madison University)	-	0.2	ND	NAFI 4	
A6	Chloramphenicol + Nitrofurans	1.786							ND		
	Chloramphenicol 1.015	hloramphenicol 1.015 Chloramphenicol			Meat of aquaculture products,	Elisa (R- Biopharm) Elisa (Euro –	-	0.2		ND	NAFI 1-5
				water Diagnostica)	Diagnostica)	-	0.2			NAFI 6	
A6			Meat of aquaculture products	-	GC/MS	-	0.1	ND	NAFI 6		
				Meat of aquaculture products, water	-	LC/MS/MS	-	0.1	ND	NAFI 4	
	Nitrofurans	771				-			ND		
	Furaltadone metabolite	254	AMOZ	Meat of aquaculture products	Elisa (R- Biopharm)	-	0.2	-	ND	NAFI 1, 2, 3	

	Furazolidone metabolite	254	AOZ	Meat of aquaculture products	Elisa (R- Biopharm)	-	0.2	-	ND	NAFI 1, 2, 3
	Furaltadone metabolite	517	AMOZ		-	LC/MS/MS (Rilkilt-	0.5	ND		
	Furazolidone metabolite	517	AOZ	Meat of				0.5	ND	NAFI
	Nitrofurantoin metabolite	771	AHD	products		Dutch)	-	1	ND	4, 5, 6
	Nitrofurazone metabolite	771	SEM					1	ND	1
			Chlotetracycline	Meat of		HPLC (J. Chromatogr		20	100	
		194	Oxytetracycline	aquaculture products	-	623:1992 page 153-	-	10	100	NAFI 4
	Tetracycline		Tetracycline			158)		10	100	
	Tetracyerine		Chlotetracycline	Meat of aquaculture products				20	100	NAFI
			Oxytetracycline			HPLC (AOAC 995.09)	-	10	100	
-			Tetracycline					10	100	1, 5, 0
			Ciprofloxacin	Meat of aquaculture products					100	NAFI 4
			Enrofloxacin		Elisa	HPLC-FLD and			100	
		nolones 593	Flumequin						600 in fish, 200 in others	
			Difloxacin			LC/MIS/MIS			300	
			Sarafloxacin						30	
	Quinolones		Danofloxacin						100	
	Quinoiones		Oxolinic acid						100	
			Ciprofloxacin	Meat of aquaculture products				100		
			Enrofloxacin			HPLC (Journal of food			100	
			Flumequin		-	and drug analysis, Vol. II, No 2, 2003, page			600 in fish, 200 in others	NAFI 1,5, 6
			Difloxacin			114-127)			300	
			Sarafloxacin]					30	

			Danofloxacin						100	
			Oxolinic acid						100	
			Sulfadiazine							
			Sulfadimidine	Meat of				20 - 30		NAFI 4
	Sulfonamides	594	Sulfamethoxazole	aquaculture		$\frac{\text{HPLC}(\text{AUAC VOI.80},}{\text{No} 3(2003)}$			100	
			Sulfadimethoxine	products		1(0.5,2005)		10		NAEL6
			Sulfachlorpyridazine					10		INALIO
				Meat of	-	LC/MS/MS	-	10	50	NAFI 4
	Trimethoprim	185	Trimethoprim	aquaculture products		HPLC/FL		50	50	NAFI 6
				Meat of	-	LC/MS/MS	-	0.1	1000	NAFI 4
	Florfenicol	118	Florfenicol	aquaculture products	HPLC/UV	HPLC/PDA		50	1000	NAFI 6
B2a and Triflu-	Anthelmintics	300	Trichlorfon	Meat of	-	LC/MS/MS (BayerAG)	-	5		NAFI 4
			(Dipterex)	aquaculture products	-	GC/MS (AOAC 991.07- 1995)	-	10	ND	NAFI 6
		177	Praziquantel	Meat of						NAFI
				aquaculture	-	LC/MS/MS	-	-	-	4, 6
ralin				products Meat of						,
	Trifluralin	177	Trifluralin	Meat of	_	GC/MS	_	_	100	NAFI
				products	_	00/110	_		100	4, 6
B3a+	B3c+B3d + B3e	882								
			Aldrin						200	
		ganochlorine compounds 210 cluding PCBs	Dieldrin						200	
			Endrin						50	
	Organochlorine		Heptachlor	Meat of		GC-ECD (PrEN		075	200	NAEL 4
B3a	compounds including PCBs		DDT	products		1528:1996)		0.7 - 5	1000	NAFI 4
			Chlordane						50	-
			BHC						200	
			Lindane						1000	
			Aldrin	Meat of	-	GC-ECD (AOAC	-	2	200	NAFI 6
						 X 				

			Dieldrin	aquaculture		983.21)		2	200						
			Endrin	products				2	50						
			Heptachlor					2	200						
			DDT					10	1000						
			Chlordane					5	50						
			BHC					2	200						
			Lindane					2	1000						
			Pb			AAS (NMKL No.139- 1991)	-	5	200 in fish, 500 in shrimp						
ВЗс	Chemical elements		Hg	Meat of aquaculture products	-	AAS (AOAC No.974.14-1990 and 971.21-1990)	-	10	500	NAFI 4					
		210	Cd			AAS (NMKL No.139- 1991)	-	1	50 in fish, 500 in shrimp						
			Pb	- Meat of aquaculture	AAS (AOAC 972.23 1995) AAS (AOAC 974.14 1995)	AAS (AOAC 972.23 1995)	-	40	200 in fish, 500 in shrimp						
			Hg			-	20	fish, 500 in shrimp 500	NAFI 6						
			Cd	products		AAS (AOAC 973.34 1995)	-	20	50 in fish, 500 in shrimp						
B3d	Mycotoxins	162	Aflatoxine	Meat of aquaculture products	-	HPLC (AOAC edition 1997, Volume II, chapter49, page 18-19)	-	1	4	NAFI 1, 4, 6					
B3e	Dyes	300	Malachite Green/ Leucomalachite	Meat of aquaculture	-	LC/MS/MS (AOAC international Vol.78, No.6,1995)	-	0.5	ND	NAFI 4					
	-	-		·	-	-		Green	products	HPLC (AOAC international	-	1	2.0		NAFI 5, 6

			Vol.78, No.6,1995)				
	179	Crystal Violet/Leucocrytal		LC-MS/MS (FDA No.4395, Vol. 23,	-	0.5	NAFI 6
		Violet		2007)			