Progress Report on the National Residues Monitoring Program for Certain Harmful Substances in Aquaculture Fish

1. General

The National Residues Monitoring Program (NRMP) for residues of certain harmful veterinary drugs and others substances in aquaculture fish and fishery products is implemented with allocated budget and plan approved by the Ministry of Agriculture, Livestock and Irrigation (MOALI) . The DOF within MOALI is the designated Central Competent Authority (CCA) for fishery product exports to the EU. Fish Inspection and Quality Control Section (QCRS)[1] under Department of Fisheries (DOF) is responsible for carrying out the NRMP in accordance with the written procedures described in Official Control System Manual (OCRS-MANUAL) for the Inspection and Certification of Fish and Fishery Products. The Residues Monitoring Committee (RMC) is responsible for managing the effective implementation, monitoring and reporting of all NRMP activities. The Inspection and Certification Unit and the Analytical Laboratory Unit of QCRS are responsible for sampling and testing respectively.

2. Scope and species monitored by regions

Table 1. Scope of the NRMP 2016/17

Region	Township	Area(Ha)	Total Production in the Segregated System (MT)	Farms	Aquaculture Species
Yangon	Kyauk Tan	235.59	1528	3	Crab (*Scyllaserrata and Scyllaolivacea*)
Yangon	TwanTay	474.85	1680.20	4	Carfu (*Cyprinuscarpio*), Rohu (*Labeorohita*),Tilapia (*Oreochromisspp.*), Pangush (*Pangasius spp.*), Puti (*Puntius*), Katla (*Catlacatla*), Mrigal(*Cirrhinus spp.*)
Ayeyarwaddy	NyaungDone	312	2015.13	7	Carfu (*Cyprinuscarpio*), Rohu(*Labeorohita*),Tilapia (*Oreochromisspp.*), Pangush (*Pangasius spp.*), Puti (*Puntius*), Katla (*Catlacatla*), Mrigal (*Cirrhinus spp.*)
Ayeyarwaddy	MaUBin	1340.46	10529.77	18	Carfu (*Cyprinuscarpio*), Rohu (*Labeorohita*), Tilapia (*Oreochromis spp.*),Pangush (*Pangasius spp.*), Puti (*Puntius*), Katla (*Catlacatla*), Mrigal (*Cirrhinus spp.*)
Ayeyarwaddy	Pathein	83.00	250.00	1	Asian tiger shrimp (*Penaeus monodon*) and white leg shrimp (*Penaeus' vannamei*)
Ayeyarwaddy	Laputta	338.6	770.0	3	Crab (*Scyllaserrataand Scyllaolivacea*)
	Ngaputaw[2]	445.87	210	1	Asian tiger shrimp (*Penaeus monodon*)

[1]FIQCS was renamed to QCRS by November 2016 but for the sake of continuity with the Annual Plan (2016/2017) the term FIQCS will be maintained in this report.
[2] This farm was added to the original Plan by February 2017.

Ayeyarwaddy					
Thanintharyi	Kyunsu	89.1	747.85	1	Crab (*Scyllaserrataand Scyllaolivacea*)
Total		**3319.47**	**17730.948**	**38**	

2.1 Sampled Species

All samples have been collected at farms, included in the segregated system, at all stages of production. For Group A substances several sizes of the animals from nursery farms and grow out farms were taken and for Group B Substances the size of animals were mostly approximately 900 g to 1 kg (market size).

Table2–Places of Sample Collection

No.	Production Stage	Samples taken	Testing parameters
1.	Aquaculture site	Farmed fish at all growth stages	A1, A3, A6
2.	Aquaculture site	Farmed fish ready to be placed on the market	B1,B2a,B3a,B3c,B3e
3.	Aquaculture site	Dried feed pellets and raw rice brand	B3d (AflatoxinB1)

3. Sampling and Testing

3.1 Sampling

The sampling was carried out by the Inspection and Certification Unit (ICU) in accordance with the plan approved by the RMC and further developed to monthly sampling plans by parameter and districts.

Table 3.1: Sampling in 2016/17

Regions	Yangon (Kyauk Tan)		Yangon (Twantay)		Ayeyarwaddy (Nyaung Done)		Ayeyarwaddy (Ma U Bin)		Ayeyarwaddy (Pathein)		Ayeyarwaddy (Laputta)		Tanninthary (Kyun Su)		Ayeyarwaddy (Ngaputaw)		Total		
Group of Substances	Plan	De facto	Plan	De facto	Plan	De facto	Plan	De facto	Plan	De facto	Plan	De facto	Plan	De facto	Plan	De facto	Plan	De facto	Deviation
Column 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20= (19-18)
A1 Group (Stilbenes): diethylstillbestrol	0	0	2	2	2	2	12	12	0	0	0	0	0	0	0	0	16	16	0
A3 Group (Steroids) Methyltestosterone			2	2	3	3	11	11	0	0	0	0	0	0	0	0	16	16	0
A6 Group (Prohibited Veterinary medicines); Chloramphenicol, Nitrofurans	5	5	2	3	2	3	12	12	1	1	3	3	3	3	0	1	28	31	+3
B1 Group (Antibacterial Substances): Tetracycline, Chlorotetracycline, Oxytetracycline, Oxolinic acid, Florfenicol)	5	5	5	5	7	7	35	35	1	1	3	3	3	3	0	1	59	60	+1
B2a: Anthelmintics (Praziquantel)	3	3	2	2	3	3	15	15	1	1	1	1	1	1	0	1	26	27	+1
B3a Group (Organochlorinated Pesticides): DDT, Aldrin, Dieldrin	1	1	1	1	1	1	6	6	1	1	1	1		0	0	1	11	12	+1
B3a Group (Dioxins and PCBs)	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	0	7	7	+7[3]

[3] In one sampling session, 2 samples were taken in each of the 7 sampling points, however merged to one sample per sampling point prior to analysis.

B3c Group (Heavy Metals):, Pb, Cd, Hg	1	1	1	2	2	2	4	4	1	1	1	1	1	1	0	1	11	13	+2
B3d Group (Mycotoxin) : Aflatoxin (B1)			1	2	1	2	7	8	1	1	0	0	0	0	0	0	10	13	+3
B3e Group (Dyes): MG/LMG, CV/LCV	1	1	1	1	0	0	4	4	0	0	0	0	1		0	1	7	8	+1
Total	16	16	17	20	21	23	106	107	6	6	9	9	9	8	0	6	184	203	+19

3.2 Testing

Table 4: Analytical Results in 2016/17

Groups	Non-Compliant Results/Total Samples Analysed (%)
	Year 2016/17
A1 Group (Stilbenes): Diethylstillbestrol	0
A3 Group(Steroids): Methyltestosterone	0
A6 Group(Prohibited Veterinary Medicines): Chloramphenicol, Nitrofurans	0
B1 Group(Antibacterialsubstances): Tetracycline, Chlorotetracycline,	0
B2a Group (Anthelmintics): Praziquantel	0
B3a Group (Organochlorinated Pesticides): DDT, Aldrin, Dieldrin) Sum of Dioxins, dioxin like PCBs and non-dioxin like PCBs[4]	0 7 samples still under testing
B3c Group (Heavy metals): Pb, Cd, Hg	8% (Cd in finfish, 1 sample)
B3d Group (Mycotoxin): Aflatoxin(B1)	30.7 % (4 samples)
B3e Group (Dyes): MG/LMG,CV/LCV	0

Table 5: Testing Results in 2016/17

GROUP OF SUBSTANCES TO BE MONITORED	COMPOUND or MARKER RESIDUE	MATRIX ANALYSED	NUMBER OF SAMPLES		LEVEL OF ACTION (i.e. concentration above which a result is deemed non-compliant) [µg/Kg]	NUMBER OF NON COMPLIANT RESULTS (ABOVE LEVEL OF ACTION)
			PLANNED	TESTED		
A1. STILBENES	(Diethylstillbestrol)	LC/MS/MS	16	16	Any Detected	0
A3. SYNTHETIC STEROIDS (WITH ANDROGENIC, GESTAGENIC OR ESTROGENIC ACTIVITY)	(Methyltestosterone)	LC/MS/MS	16	16		0
A6. CHLORAMPHENICOL	Chloramphenicol	ELISA	28	31	Any Detected	0
A6. NITROFURANS						
Nitrofurantoin metabolite	AHD	LC/MS/MS		31		0
Furaltadone metabolite	AMOZ	LC/MS/MS		31		0
Furazolidone metabolite	AOZ	LC/MS/MS		31		0
Nitrofurazone metabolite	SEM	LC/MS/MS		31		0
B1. ANTIBACTERIAL SUBSTANCES 0Confirmatory test			59	60		
	Tetracycline	LC/MS/MS		49	100	0
	Chlorotetracycline	LC/MS/MS		45	100	0
	Oxytetracycline	LC/MS/MS		41	100	0
	Oxolinic	LC/MS/MS		41	100	0
	Florfenicol	LC/MS/MS		42	0.5	0
B2a. ANTHELMINTICS	Praziquantel	LC/MS/MS	26	27	Any Detected	0
B3a. ORGANOCHLORINE COMPOUNDS INCLUDING PCBS	Aldrine	GC/µECD	11	12	10	0
	Dieldrine			12	10	0
	DDT			12	10	0
	Sum of Dioxins		0	7	3,5pg/g wet weight	testing in progress
	Sum of Dioxin and dioxin like PCBs			7	6,5 pg/g wet weight	testing in progress
	Sum Non-Dioxin like PCBS			7	125 ng/g wet weight	testing in progress
B3c. CHEMICAL ELEMENTS			11	13		
	Lead(Pb)	ICPMS		12	300	0
	Mercury(Hg)			11	500	0
	Cadmium(Cd)			12	50	1
B3d. MYCOTOXINS	Aflatoxin B1	HPLC	10	13	20	4
B3e. DYES			7	8		
	Malachite Green	LC/MS/MS		8	Any Detected	0
	Leuco malachite Green			8		0
	Crystal Violet and			8		0
	Leuco-crystal violet					0
Total			184	203		5