HEILSUFRØÐILIGA STARVSSTOVAN
Faroese Food and Veterinary Authority. www.hfs.fo

Jour. No.: 20/003961

Tórshavn, 3. apríl 2020
J.NO.: 20/00396-1
By Bjørg Mikkelsen, bmi@hfs.fo

Report on official control of contaminants in Mackerel, Herring and Blue Whiting, year 2019

Summery

In 2019 the Faroese Food and Veterinary Authority sampled 290 whole fishes of different size and weight of Mackerel (*Scomber scombrus*), 570 whole fishes of Herring (*Clupea harengus*) and 100 whole fishes of Blue Whiting (*Mikromesistius Poutassou*). The samples were polled to 29 samples of Mackerel, 57 samples of Herring and 10 samples of Blue Whiting. The samples were obtained from the Faroe Islands fishing area Vb, Iceland grounds Va, North Sea IVa, Norwegian Sea IIa.

No samples exceeded existing regulatory limits. There were no concerns for human health.

Background

The Faroese Food and Veterinary Authority conducts an official control programme to verify that foodstuffs comply with the maximum levels for certain contaminants. The monitoring is associated with the Faroese legal framework, which implements regulations from the European Commission. The sampling procedure and methods for fishery products was based on Faroese Departmental order No. 148/2009[1]. The interpretation of results was done according to Faroese Departmental order no. 147/2009[2] sets the maximum levels for certain contaminants in foodstuffs.

Methodology

The official inspector sampled 290 whole fishes of different size and weight of Mackerel (*Scomber scombrus*), 570 whole fishes of Herring (*Clupea harengus*) and 100 whole fishes of Blue Whiting (*Mikromesistius Poutassou*) from Faroese business operators.

Analyses and regulatory limits

The samples were analysed for heavy metals[3], PCBs, Dioxins[4], pesticides screening (organochlorine Pesticides and Pyrethroids) and radioactivity.

[1]Kunngerð 148 frá 1. desember 2009 um royndartøku og greiningarhættir, ið skulu nýtast í samband við alment eftirlit við ávísum dálkandi evnum í matvørum (implements Regulations (EC) No 1883/2006 and 333/2007) .
[2] Kunngerð 147 frá 1. desember 2009 um áseting av markviðum fyri ávís dálkandi evni í matvørum (implements Regulation (EC) No 1881/2006).
3 The analyses were performed by ICP-MS (ISO 17294-1,2 2005 mod) at Food and Veterinary Agency, 100 Torshavn, Faroe Islands. DANAK reg.no.303.

Samples

The fish samples were taken from frozen blocks, approximately 10 fishes for one sample. Bagged samples of representative fish of same size where collected in one large plastic bag. The plastic bags where labelled to ensure traceability. The laboratory then homogenises the muscle form the fish to an aggregate sample of 1kg. The samples were polled to 29 samples of Mackerel (200-600g, WR) and 57 samples of Herring (350g+ WR and IQF) and 10 Blue whiting (100+g). The samples were kept frozen at the laboratories until analysed.

Results

The results from the control of trace elements in pooled samples form Mackerel, Herring and Blue Whiting contained low levels cadmium and mercury. Lead and inorganic arsenic were not detected. Table 1 presents the levels of heavy metals in different fish species analysed in 2019.

Table 1, Levels of heavy metals in Blue Whiting, Herring and Mackerel, 2019. (Certified reports from the laboratory are in FFVA file 19/00060).

Analyses	Unit	Blue Whiting		Herring		Mackerel		Regulatory limits
		n	mean	*n*	mean	*n*	mean	
Lead, Pb	mg/kg	*10*	<0,02	*57*	<0,02	*29*	<0,02	0,3
Cadmium, Cd	mg/kg	*10*	0,004	*57*	0,01	*29*	0,01	0,05/0,1
Mercury, Hg	mg/kg	*10*	0,05	*57*	0,07	*29*	0,05	0,5
Arsenic, inorganic	mg/kg	*5*	<0,05	*27*	<0,05	*13*	<0,05	Not defined

The levels of PCB, dioxins or dioxinlike-PCBs are summarized in table 2 and an overview of the pesticide screening is in annex. The levels were low and none of the samples contained levels of PCB, dioxins or dioxinlike-PCBs above current limits.

Conclusion

In general, the samples were in line with existing regulatory limits. There were no concerns for human health.

[4] The analyses were performed by high resolution gas chromatography/high resolution mass spectroscopy (HRGC/HRMS) at Eurofins/ERGO, Hamburg, Germany DANAK reg.no.222. Dioxins (PCDD/F 17 congeners): (PCDDs): 2,3,7,8-TCDD; 1,2,3,7,8-PeCDD; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8- HxCDD; 1,2,3,7,8,9- HxCDD; 1,2,3,4,6,7,8- HpCDD; OCDD. Dibenzofurans (PCDFs): 2,3,7,8-TCDF; 1,2,3,7,8-PeCDF; 2,3,4,7,8-PeCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,6,7,8- HxCDF; 1,2,3,7,8,9- HxCDF; 2,3,4,6,7,8-HxCDF; 1,2,3,4,6,7,8- HpCDF; 1,2,3,4,7,8,9-HpCDF; OctaCDF. Dioxin-like PCBs (12WHO-PCBs) : PCB 77; PCB 81; PCB 126, PCB 169; PCB 105; PCB 114; PCB 118; PCB 123; PCB 156; PCB 157; PCB 167, PCB 189. Total 6 DIN-PCB: PCB 28, PCB 52, PCB 101, PCB 138, PCB 153, PCB 180.

Table 2. Levels of contaminants in Mackerel (Scomber scombrus), Herring (Clupea harengus) and Blue Whiting (Mikromesistius Poutassou), Year 2019 (Certified reports from the laboratory are in FFVA file 19/00060).

Analyses	**Unit**	**Blue Whiting**		**Herring**		**Mackerel**		Regulatory limits
		n	**mean**	***n***	**mean**	***n***	**mean**	
Fat content	g/100 g	*5*	0,9	*26*	20,4	*10*	18,9	
Total 6 DIN-PCB (incl. LOQ)	ng/g	*5*	3	*27*	6	*12*	4	75
Dioxin; WHO(2005)-PCB TEQ incl. LOQ	pg/g	*5*	0,2	*27*	0,4	*12*	0,4	3,5
WHO(2005)-PCDD/F TEQ incl. LOQ	pg/g	*5*	0,3	*27*	0,5	*12*	0,3	-
Dioxin+PCBs; WHO(2005)-PCDD/F+PCB TEQ incl. LOQ	pg/g	*5*	0,5	*27*	0,9	*12*	0,8	6,5
Radioactivity Cs 134, Cs 137, Iod 131	Bq/kg	*3*	<10	*23*	<10	*13*	<10	
Pesticides screening, annex								

Total 6 DIN-PCB: PCB 28, PCB 52, PCB 101, PCB 138, PCB 153, PCB 180. TEQ (toxic equivalent factors) WHO 2005
Dioxin-like PCBs (12WHO-PCBs) : PCB 77; PCB 81; PCB 126, PCB 169; PCB 105; PCB 114; PCB 118; PCB 123; PCB 156; PCB 157; PCB 167, PCB 189. TEQ (toxic equivalent factors) WHO 2005
Dioxins (PCDD/F 17 congeners): (PCDDs): 2,3,7,8-TCDD; 1,2,3,7,8-PeCDD; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8- HxCDD; 1,2,3,7,8,9- HxCDD; 1,2,3,4,6,7,8- HpCDD; OCDD. Dibenzofurans (PCDFs): 2,3,7,8-TCDF; 1,2,3,7,8-PeCDF; 2,3,4,7,8-PeCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,6,7,8- HxCDF; 1,2,3,7,8,9- HxCDF; 2,3,4,6,7,8-HxCDF; 1,2,3,4,6,7,8- HpCDF; 1,2,3,4,7,8,9-HpCDF; OctaCDF. TEQ (toxic equivalent factors) WHO 2005
Pesticides screening parameters are in Annex 1.

Smyrilsvegur 7, 2. hædd
FO-100 Tórshavn
Faroe Islands
Tel. **+298 556 400**
E-mail: hfs@hfs.fo
Homepage: http://www.hfs.fo

ANNEX 1.

Pesticides OC (incl. Pyrethroides) screening SP101-6* Organochlorine Pesticides and Pyrethroids **Method** DFG S19 Mini-Silica Gel-Eluates 1+2 **Parameters** LOQ Aclonifen 0.01 mg/kg Acrinathrin 0.01 mg/kg Aldrin 0.002 mg/kg Benfluralin 0.002 mg/kg Bifenox 0.02 mg/kg Bifenthrin 0.01 mg/kg Binapacryl 0.01 mg/kg Bromocyclen 0.01 mg/kg Bromoxynil-octanoate 0.01 mg/kg Butralin 0.02 mg/kg Chlordane, cis- 0.002 mg/kg Chlordane, oxy- 0.002 mg/kg Chlordane, trans- 0.002 mg/kg Chlorfenapyr 0.005 mg/kg Chlorfenprop-methyl 0.01 mg/kg Chlorfenson 0.01 mg/kg Chloroneb 0.02 mg/kg Chlorothalonil 0.01 mg/kg Chlorthal-dimethyl 0.002 mg/kg Cyfluthrin 0.01 mg/kg Cyhalothrin, lambda- 0.01 mg/kg Cypermethrin 0.01 mg/kg Cypermethrin, alpha- 0.01 mg/kg DDD, o,p- 0.002 mg/kg DDD, p,p- 0.002 mg/kg DDE, o,p- 0.002 mg/kg DDE, p,p'- 0.002 mg/kg DDT, o,p'- 0.002 mg/kg DDT, p,p- 0.002 mg/kg Deltamethrin 0.01 mg/kg Diallate 0.1 mg/kg Dibromobenzophenone, p,p- 0.01 mg/kg Dichlobenil 0.005 mg/kg Dichlone 0.02 mg/kg Dichlorobenzophenone, o,p- 0.01 mg/kg Dichlorobenzophenone, p,p- 0.01 mg/kg Dicloran 0.002 mg/kg	**Pesticides OC (incl. Pyrethroides) screening** Dicofol, o,p- 0.01 mg/kg Dicofol, p,p- 0.01 mg/kg Dieldrin 0.002 mg/kg Dienochlor 0.01 mg/kg Dinitramine 0.005 mg/kg Dinobuton 0.01 mg/kg Dinocap 0.1 mg/kg Endosulfan sulphate 0.004 mg/kg Endosulfan, alpha- 0.002 mg/kg Endosulfan, beta- 0.002 mg/kg Endrin 0.003 mg/kg Endrin ketone 0.01 mg/kg Esfenvalerate 0.01 mg/kg Ethalfluralin 0.005 mg/kg Etridiazole 0.01 mg/kg Fenfluthrin 0.01 mg/kg Fenpropathrin 0.01 mg/kg Fenson 0.01 mg/kg Fenvalerate (RR-/SS-Isomers) 0.01 mg/kg Fenvalerate (RS-/SR-Isomers) 0.01 mg/kg Flubenzimine 0.005 mg/kg Fluchloralin 0.005 mg/kg Flucythrinate 0.01 mg/kg Flumetralin 0.005 mg/kg Fluorodifen 0.01 mg/kg Fluoroimide 0.02 mg/kg Genite 0.01 mg/kg Halfenprox 0.01 mg/kg HCH, alpha- 0.002 mg/kg HCH, beta- 0.004 mg/kg HCH, delta- 0.002 mg/kg HCH, epsilon- 0.002 mg/kg Heptachlor 0.002 mg/kg Heptachlor epoxide, cis- 0.002 mg/kg Heptachlor epoxide, trans- 0.002 mg/kg Hexachlorobenzene (HCB) 0.002 mg/kg Ioxynil-Octanoate 0.01 mg/kg Isobenzan 0.002 mg/kg Isodrin 0.002 mg/kg Isopropalin 0.005 mg/kg Lindane (gamma-HCH) 0.002 mg/kg	**Pesticides OC (incl. Pyrethroides) screening** Methoxychlor 0.01 mg/kg Mirex 0.002 mg/kg Nitrapyrin 0.01 mg/kg Nitrofen 0.003 mg/kg Nonachlor, cis- 0.002 mg/kg Nonachlor, trans- 0.002 mg/kg Octachlorstyrene 0.01 mg/kg Oxyfluorfen 0.005 mg/kg Pendimethalin 0.005 mg/kg Pentachloranisole 0.002 mg/kg Pentachloroaniline 0.002 mg/kg Pentachlorobenzene 0.005 mg/kg Pentachlorothioanisole 0.002 mg/kg Permethrin 0.01 mg/kg Plifenate 0.01 mg/kg Polychloroterpene (Camphechlor) 0.05 mg/kg Profluralin 0.002 mg/kg Quintozene 0.002 mg/kg S 421 0.005 mg/kg tau-Fluvalinate 0.01 mg/kg Tecnazene 0.002 mg/kg Tefluthrin 0.01 mg/kg Tetradifon 0.005 mg/kg Tetrasul 0.01 mg/kg Tralomethrin 0.02 mg/kg Transfluthrin 0.01 mg/kg Triallate 0.01 mg/kg Trichloronat 0.005 mg/kg Trifluralin 0.002 mg/kg