



**European Union Reference Laboratory for Fish Diseases**  
National Veterinary Institute, Technical University of Denmark, Copenhagen



## Survey & Diagnosis of listed fish diseases in the European Union 2013

Niels Jørgen Olesen, Anemone Ojala

**18<sup>th</sup> Annual Workshop**  
of the National Reference Laboratories for Fish Diseases  
Copenhagen, Denmark, June 3-4, 2014

## Survey & Diagnosis of listed fish diseases in the European Community 2013 <sup>2</sup>

An Annual questionnaire

1. General data
2. Epidemiological data
3. Laboratory data, NRL and regional laboratories

Status on implementation of the new fish health surveillance legislation

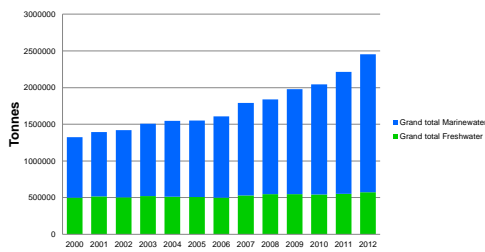


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## Total production of fish in aquaculture in Europe 2000 to 2012 <sup>3</sup>

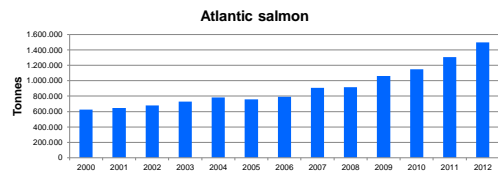
(<http://www.fao.org/figis>)



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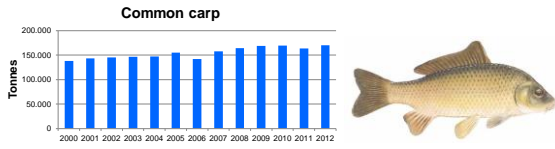


## Production 2000 to 2012 <sup>4</sup> (<http://www.fao.org/figis>)

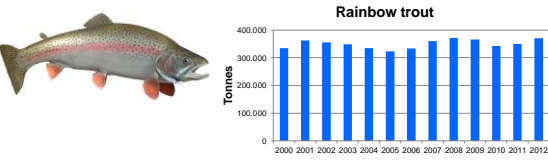


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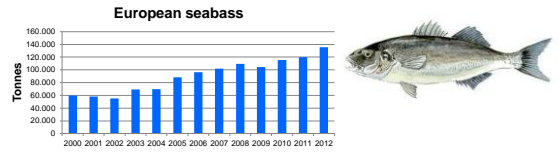




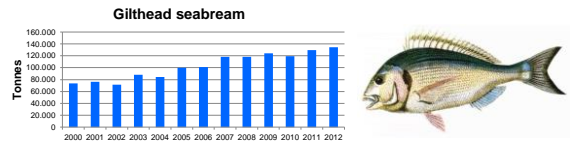
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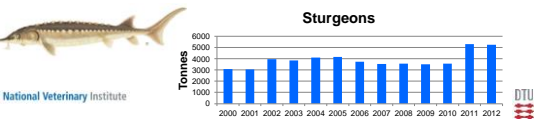
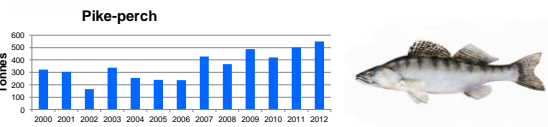
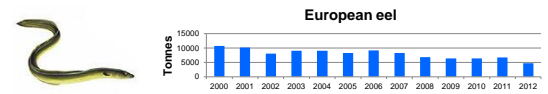


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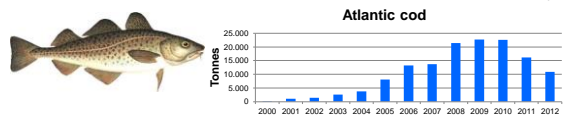


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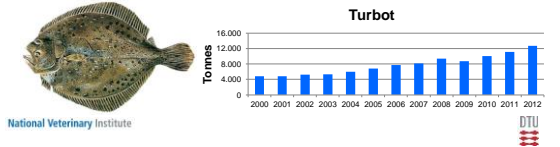
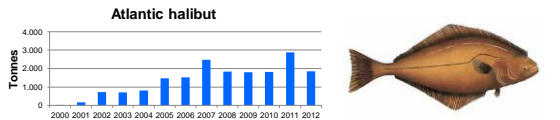
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### General data, whole country or region

9

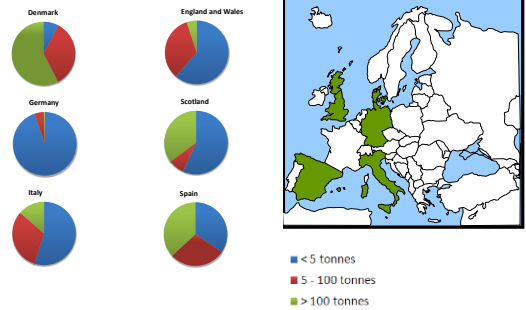
1. Number of fish farms within country/region, according to size of production (tonnes fish/year) ? No farm data in FIGIS
2. According to fish species
3. Categorisation according to Council Directive 2006/88
4. Number of fish farms surveyed for other diseases
5. Do you have active or passive surveillance for these diseases

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### % Distribution of farms according to size in 2013

10

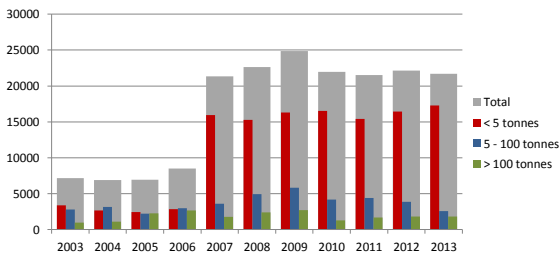


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### Number of farms according to size from 2003 to 2013

11



Total number of fish farms in the MS calculated from data in 1.1.: (<5t)+ (5-100 t) + (>100 t)

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### Number of fish farms within country/region, according to fish species in the Northern European countries 2013

12

	Rainbow trout	Atlantic Salmon	Other salmonids	Carp	Eel	Flat fish	Seabream/Seabass	Other marine spp.	Other freshwater spp.	Total
Denmark	209	5	54	7	7	2	1	2	5	292
Finland	235	41	400	21	1				228	926
Ireland	11	41	3	1					2	58
Sweden	106	15	142	4	2				8	277
England and Wales	164	26	143	140	12	1	1	1	127	615
Scotland	45	361	41	4		5	1	101	3	561
Northern Ireland	17	4	5	5					3	34
Iceland	10	13	29			3		5	1	61
Norway	All salmonids are reported as Atlantic salmon	1221			Include d in other marine spp	Include d in other marine spp		110		1331
Faroe Islands		34								34
<b>Total</b>	<b>797</b>	<b>1761</b>	<b>817</b>	<b>182</b>	<b>22</b>	<b>11</b>	<b>3</b>	<b>219</b>	<b>377</b>	<b>4189</b>

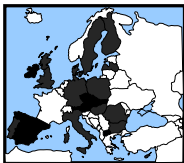
Number of fish farms within country/region, according to fish<sup>13</sup> species in the *Continental European countries* 2013

	Rainbow trout	Atlantic Salmon	Other salmonids	Carp	Eel	Flat fish	Seabream/Seabass	Other marine spp.	Other freshwater spp.	Total
Austria									6	97
Belgium	44	1	40	6						
Czech Republic	177	1	289	1483	5				1121	3076
Estonia	22	1	5	4	3				8	43
France	600	26	112	358	11	4	18	17	486	1632
Germany	4082	15	1228	6012	128	5	11	16	3826	15323
Hungary	4			230					12	246
Latvia	45	5	30	75	1				10	166
Lithuania	3			19	1				10	33
Netherlands	45		1	2	20	3			80	151
Poland	601			3483					358	4442
Slovakia	81			88					1	170
Switzerland	209		139						9	357
Total	5913	49	1844	11760	169	12	29	33	5927	25736

Number of fish farms within country/region, according to fish<sup>14</sup> species in the *Mediterranean European countries* 2013

	Rainbow trout	Atlantic Salmon	Other salmonids	Carp	Eel	Flat fish	Seabream/Seabass	Other marine spp.	Other freshwater spp.	Total
Bulgaria	85				236			1	15	337
Cyprus	7						9	2	2	20
Greece	62		2	7	4		340		3	418
Italy	330		37	21	22		124	not available	42	576
Portugal	26				1	5	82			114
Romania	121		26	323		1			323	794
Slovenia	118		52	84			1		70	325
Spain	95	7	33	5	2	53	79	39	19	332
Croatia	25		6	24			29	3		87
Turkey										
Bosnia and Herzegovina										
Kosovo										
Albania										
Rep. of Macedonia										
Total	869	7	156	701	28	59	664	45	474	3003

Countries surveyed for **SVC** 2013<sup>15</sup>

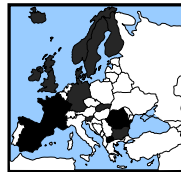


21 countries with SVC programs

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Country	Number of fish farms involved 2011/2012	SVCV Programme based on:	Number of fish farms involved 2013
Bulgaria	104/104	National programme	97
Czech Republic	?	Research survey	1
Denmark	5/6	Fishfarms: national surveillance; passive, active and targeted. Outlet stores and private garden ponds: no National/EU	6
Finland	1/2	27 x regional programmes based on clinical routine check, 15 x active control based on clinical routine check	20
Germany	122/61	national surveillance programme	109
Hungary	130/133	national surveillance programme	156
Ireland	?	National surveillance (active sampling); involves one farm plus samples from put & take fisheries when available.	1
Italy	Not available		Not available
Latvia	24/1	Passive surveillance	
Poland	30/30	National survey	30 farms twice per year
Portugal	1/1	Active surveillance	1
Romania	19/27	National surveillance and/or industry financed	27
Slovakia	0/87	National surveillance financed by NRL for fish diseases	77
Spain	?	Regional Programme	
Sweden	1/1	national programmes	4
England and Wales	150/157	National Programme under Article 43 of Council Directive 2006/88/EC	143
Scotland	3/1	National surveillance - based on inspectors (active surveillance)	1 in 2013 (3 in programme)
Northern Ireland	0/2	regional SVC programme (additional guarantees)	2
Rep. of Macedonia	?	National (passive) surveillance	8

Countries surveyed for **BKD** 2013<sup>16</sup>

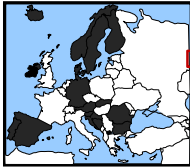


17 countries with BKD program especially salmon farming countries

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Country	Number of fish farms involved 2011/2012	BKD Programme based on:	Number of fish farms involved 2013
Bulgaria	50/39	National programme	35
Denmark	44/43	National surveillance; passive and active. Targeted BKD brood stock testing and industry financed BKD programme	38
Finland	79/186	National/Regional programme + 44 (volunteer program)	293 (eradication programme)
France	?	Regional subsidised programmes implemented by farmers' associations (Groupement de défense sanitaire aquicole)	
Germany	181/190	15 x active control based on clinical routine check	194
Ireland	?	National surveillance (active sampling). Industry financed	23
Romania	7		1
Slovenia	1/2	Fish farm programme	2
Spain	31	Regional Programme	1
Sweden	124/124	national programmes	120
England and Wales	149/172	Domestic programme - active surveillance	149
Scotland	205/172	Domestic surveillance - based on inspectors at all sites (active surveillance) and broodstock testing at one site	187 in 2013 (409 in programme)
Northern Ireland	10/24	regional BKD programme (additional guarantees)	26
Iceland	13/16	National BKD program running since 1985 (industry financed)	15
Norway	109 (same as 2013)	List 3. National surveillance program - wild brood fish caught for cultivation purposes in rivers, and for live gene bank	List 3: All farms with susceptible species, Surveillance: Brood fish for river cultivation programs for salmonids, 33 rivers/hatcheries.
Faroe Islands	25/25	Industry programmes - BKD broodstock	34
Rep. of Macedonia	?	National (passive) surveillance	13

## Countries surveyed for IPN 2013 <sup>17</sup>

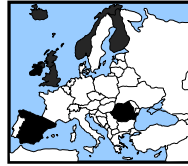


18 countries with IPN program

Country	Number of fish farms involved 2011/2012	IPN	
		Programme based on:	Number of fish farms involved 2013
Bulgaria	50/29	National programme	35
Denmark	34/36	National surveillance, passive and active. Targeted IPN broodstock testing.	42
Finland	65/293	National/Regional	283
Germany	347/343	18 regions programme based on clinical routine check, 29 x active control based on clinical routine check	306
Ireland	All salmonid farms	National surveillance (active sampling). Includes industry financed IPN screening of broodstock for one farm.	53
Portugal	0/26	Passive surveillance	26
Romania	15/6	National surveillance and/or industry financed	14
Slovakia	0/134	National surveillance financed by NRL for fish diseases	77
Slovenia	1/2	Fish farm programme	2
Spain	133/125	Regional Programme	47
Sweden	129/129	national programmes	152
Northern Ireland	10/24	targeted surveillance	26
Croatia	30/30	Passive surveillance	25
Iceland	13/12	National program, mainly based on IPN brood stock testing, running since 1985 (Industry financed)	10
Norway	All active farms With susceptible species	Not listed. Passive surveillance and investigation of cases with increased mortality. Surveillance: Brood fish for river cultivation programs for salmonids; 33 river hatcheries.	All farms with susceptible species
Switzerland		IPN is a notifiable disease. In case of detection of positive fish in a farm, stocks are eliminated	
Faroe Islands		Industry programmes - IPN broodstock	34

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## Countries surveyed for *Gyrodactylus salaris* 2013 <sup>18</sup>



9 countries with G. sal. program

Country	Numbers of fish farms involved in 2011/2012	<i>Gyrodactylus salaris</i>	
		Programme based on:	Number of fish farms involved in 2013
Finland	Regional survey of wild fish and at the only one farm at Barents Sea catchment.	Regional survey (watercourses running into the Barents Sea). More farms are examined in the connection with export/research (these farms are situated in the Baltic Sea catchment, where <i>G. salaris</i> is endemic).	Regional survey of wild fish and at the only one farm at Barents Sea catchment.
Ireland	All salmonid farms, five river catchments 150/140	National surveillance (active sampling of FW salmonid farms plus rivers (4 rivers sampled in 2013).	18
Romania	?	Industry financed	5
Spain	?	Regional Programme	?
England and Wales	189/175	National Programme under Article 43 of Council Directive 2006/88/EC	172
Scotland	84/69	National surveillance - based on inspections (active surveillance)	74 in 2013 (151 in programme)
Northern Ireland	8/21	regional OS programme (additional guarantees)	22
Iceland	5/5	National surveillance based on inspections (passive surveillance) and microscopical survey, in farms rearing wild salmon fingerlings released back to salmon rivers	5
Norway	93/89	List 3. National surveillance programme, 89 farms (and 65 wild Atlantic salmon in rivers)	89

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## 2. Epidemiological data <sup>19</sup>

- Number of fish farms **considered to be infected**
- Number of fish farms with susceptible species that are **considered to be free**
- Number of fish farms with susceptible species for which the infection status of the following diseases **is unknown**:



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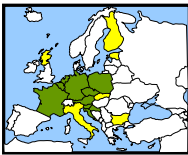
## 2. Epidemiological data <sup>20</sup>

- Other fish diseases than VHS, IHN, SVC, KHV or ISA?
- Is there an **increase or decrease in the number of fish farms infected** with listed diseases compared to previous years ?
- Is there a general increase or decrease in the **severity of infections** with listed diseases compared to previous years ?

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Number of salmonid farms considered to be infected with **VHS** in Europe, 52 of 27688 farms <sup>21</sup>

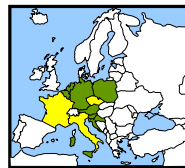


- 56 farms in 2012
- 52 farms in 2013 considered VHSV positive in Europe!
- 9 countries reported VHS infected farms

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Country	Total number of farms/positive		
	2011	2012	2013
Austria	1319/5		1319/4
Belgium	92/2	97/2	92/2
Bulgaria	302/2	336/2	
Czech Republic	1798/1		1625/5
Croatia			99/1
Estonia	23/2		
Finland	485/31	816/26	
France	?	?	1633/10
Germany	3706/8	13735/8	12973/11
Italy	346/4		
Netherlands	46/5	151/5	151/5
Poland	470/4	3982/6	3656/8
Slovakia	76/5	168/1	
Slovenia	145/8	305/7	301/6
Scotland		429/4	

Number of trout farms considered to be infected with **IHN** in Europe, 54 of 8.896 farms <sup>22</sup>

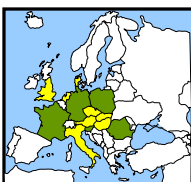


- 49 farms in 2012
- 54 farms in 2013 considered IHNV positive in Europe!

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Country	Total number of farms/positive		
	2011	2012	2013
Austria	7/3		1319/2
Belgium	85/1	97/2	92/1
Czech republic	499/1		
Croatia			99/1
Germany	3706/7	13735/6	12973/5
Italy	346/0	562/2	
Netherlands	46/8	151/8	151/8
Poland	470/8	3982/10	3656/10
Slovenia	145/33	305/29	301/27

Number of fish farms considered to be infected with **KHV** in Europe, 50 of 11.831 farms <sup>23</sup>



- 50 farms in 2013 considered KHV positive in Europe.
- Only 5 countries reported KHV

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Country	Total number of farms/positive		
	2011	2012	2013
Denmark	5/7	327/1	
Czech Republic	1573/0		
France			1633/2
Germany	6473/25	13735/33	12973/30
Hungary		275/2	
Italy	21/0	562/1	
Poland	2840/9	3982/8	3656/3
Slovenia	83/14	305/14	301/14
Romania	280/0		99/1



Number of fish farms considered to be infected with **ISA** in Europe <sup>24</sup>



No ISA positive 31.12. 2012  
No ISA positive 31.12. 2013

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Other diseases problems in  
Northern European countries  
NORWAY

25

Fish species	Virus or other pathogen	Number of fish farms/cases
Atlantic salmon	<b>Piscine reovirus</b>	<b>19</b>
Atlantic salmon	<b>Piscine myocarditis virus</b>	<b>8</b>
Atlantic salmon, rainbow trout	<b>Paramoeba perurans</b>	<b>5</b>
Atlantic salmon, rainbow trout	<b>Moritella viscosa</b>	<b>51</b>
Rainbow trout, Atlantic salmon	<b>Flavobacterium psychrophilum</b>	<b>5</b>
Atlantic cod	<b>Francisella noanutensis</b>	<b>1</b>

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Other diseases problems in  
Northern European countries  
DENMARK

26

Fish species	Virus or other pathogen	Number of fish farms/cases
Oncorhynchus mykiss	<b>BKD R. salmoninarum</b>	<b>5/12</b>
Oncorhynchus mykiss	<b>Furunculosis A. salmonicida</b>	<b>10/65</b>
Oncorhynchus mykiss	<b>Vibrio anguillarum, ERM Y. ruckeri, RTFS F. psychrophilum</b>	<b>5/25, 2/5, 1/2</b>
Cyprinus carpio	<b>KHV Cyprinid herpesvirus 1 and 2</b>	<b>2/11</b>
Salmo salar	<b>Piscine reovirus (Restocking: 176 wild broodstock tested)</b>	<b>11</b>

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FAROE ISLANDS

Fish species	Virus or other pathogen	Number of fish farms/cases
Atlantic salmon	<b>AGD Paramoeba perurans</b>	<b>7 farms</b>

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Other diseases problems in  
Northern European countries  
ESTONIA

27

Fish species	Virus or other pathogen	Number of fish farms/cases
Rainbow trout	Shewanella putrefaciens	1
Rainbow trout	Aeromonas hydrophila	3
Rainbow trout	Aeromonas sobria	1

FINLAND

Fish species	Virus or other pathogen	Number of fish farms/cases
Arctic char	<b>PKD Tetracapsuloides bryosalmonae</b>	<b>1 (first case with a domestic source of infection)</b>

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Other diseases problems in  
Northern European countries  
IRELAND

28

Fish species	Virus or other pathogen	Number of fish farms/cases
Perca fluviatilis	<b>Perch rhabdovirus</b>	<b>1</b>
Salmo salar	<b>AGD Neoparamoeba perurans</b>	<b>10</b>
Salmo salar	<b>PD Salmonid alphavirus</b>	<b>8</b>

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SWEDEN

Fish species	Virus or other pathogen	Number of fish farms/cases
Arctic char	<b>BKD R. salmoninarum</b>	<b>1</b>
Rainbow trout, Arctic char	<b>A. salmonicida salmonicida</b>	<b>3</b>
Rainbow trout	<b>Y. ruckeri</b>	<b>1</b>

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Other diseases problems in  
Northern European countries  
ENGLAND AND WALES

29

Fish species	Virus or other pathogen	Number of fish farms/cases
European Eel	Anguillid Herpesvirus 1	2 from wild caught
Common carp	Carp edema virus (CEV) -like virus	Eels 2
Common carp	Carp pox CyHV-1	6

SCOTLAND

Atlantic salmon	AGDP <sup>a</sup> Paramoeba perurans	7
Atlantic salmon	Aeromonas spp, Pasteurella spp, Vibrio spp., Pseudomonas fluorescens	Aero- 1, Past - 1, Vibrio - 9, Pseudo - 1
Atlantic salmon	Piscine Myocardiopathic Virus, Tenacibaculum maritimum, Moritella viscosa	PMCV - 2, Tenac - 2, Moritella - 4
Atlantic salmon & rainbow trout	Flavobacterium spp	1 (SAL), 1 (RTR)
Rainbow trout	Shewanella spp, Yersinia ruckeri	Shew - 1, Yersinia - 1
Lumpsuckers	Listonella anguillarum	1

Other diseases problems in  
Continental European countries  
SWITZERLAND

30

Fish species	Virus or other pathogen	Number of fish farms/cases
Sturgeon	Sturgeon herpes virus	6 cases, all same farm
Koi	Carp pox	1 case one farm
Perch	Perch rhabdovirus	2 cases in one farm

LATVIA

Fish species	Virus or other pathogen	Number of fish farms/cases
Cyprinidae and Coregonidae and Salmonidae	Aeromonosis (Aeromonas hydrophilya)	1+1+1 = 3
Cyprinidae and Acipenseridae	Aeromonosis (Aeromonas sobria)	1+1 = 2
Salmonidae and Acipenseridae	Aeromonosis (Aeromonas salmonicida)	1+1 = 2
Salmonidae and Acipenseridae	Plesiomonas shigelloides	1+1 = 2

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Other diseases problems in  
Continental European countries  
GERMANY

31

Fish species	Virus or other pathogen	Number of fish farms/cases
eel	AHV	3
catfish (Pangasius sp.)	Edwardsiella ictaluri	1
barbel	Edwardsiella tarda	1
rainbow trout	Lactococcus piscium	1
rainbow trout	A. salmonicida	4
rainbow trout	Y. ruckeri	4
char	A. salmonicida	1

BELGIUM

Fish species	Virus or other pathogen	Number of fish farms/cases
Carp	CEV Unexplained carp mortality in Winter	1

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Other diseases problems in  
Continental European countries  
FRANCE

32

Fish species	Virus or other pathogen	Number of fish farms/cases
Rainbow trout, brook trout	Yersinia ruckeri	14
Rainbow trout, brook trout, pike, fario trout	Aeromonas salmonicida salmonicida	13
Rainbow trout, Acipenser baeri	Streptococcus and lactic bacteria	15
Rainbow trout, fario trout	Lactococcus garvieae	3
Pikeperch	Aeromonas hydrophila / Aeromonas sobria	1
Roach, Koi carp	Chryseobacterium indologenes	2
Common carp	Carnobacterium maltaromaticum	1

CZECH REPUBLIC

Fish species	Virus or other pathogen	Number of fish farms/cases
koi carp	CyHV-1	1

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Other diseases problems in Mediterranean European countries

To be updated by Niccolò Vendramin later.

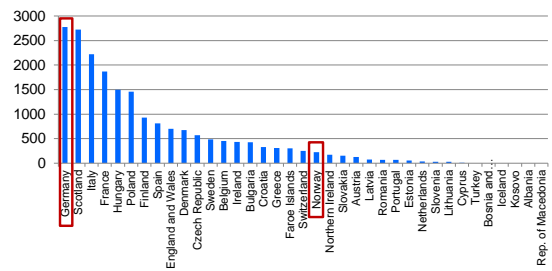
Is there an increase or decrease in the number of fish farms infected with listed diseases compared to previous years?

- 1st isolation of IHN in **Hungary**
- Decrease in number of VHS, IHN and KHV infected farms in **Austria**
- No VHS any more in **Estonia**
- **Germany**: VHS: apparent decrease; new registered outbreaks/ suspicions in 2013: 12 x VHS, 5 x IHN, 70 x KHV-1 (68 x koi, 2 x carp)
- **Netherlands**: Decrease no VHS or IHN outbreaks reported
- **Norway**: ISA increase from 2 cases in 2012 to 10 cases in 2013. List 3: PD SAV3 decrease from 97 cases in 2012 to 48 cases in 2013. SAV2 increase from 44 cases in 2012 to 55 cases in 2013.

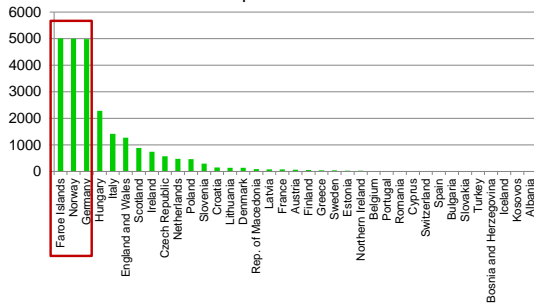
Is there an increase or decrease in the number of fish farms infected with listed diseases compared to previous years?

- **Switzerland** The number of VHS-cases decreased from 5 in 2012 to 0 in 2013, while an increase from 1 to 2 was recorded for IHN.
- **England & Wales**: been a small increase in outbreaks of KHV disease in managed fisheries in England (non-fish farm sites).
- **Scotland**: VHS in cleaner fish, no outbreaks, no susceptible species

No. of samples tested by cell cultivation.  
Total in Europe = 21.943 fish samples 2012  
Total in Europe = 20.266 fish samples 2013



No of samples tested by PCR or other direct methods without cell cultivation. Total in Europe = 20617 in 2012  
Total in Europe = 24.430 in 2013



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## Conclusion on S&D 2013

- Significant increase in marine production, 2011-2012 and very stable fresh water production. Especially the salmon production is increasing.
- Beside this few changes from 2012 to 2013.
- Unfortunately some Member states did not reply
- VHS resolved in Scotland (Wrasse)
- VHS resolved in Estonia
- Denmark approved VHS free country
- IHN in Hungary
- VHS and IHN in Croatia
- Increased number of ISA outbreaks in Norway but no infected farms 31.12.2013!
- Still significant under-reporting for VHS, IHN and KHV
- Apparently significant problems with Nodavirus infection in Mediterranean Sea bass production

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## 2013

- Raw data are not included in folder this year.
- If interested all data can be retrieved from our web site:

[WWW.EURL-Fish.EU](http://WWW.EURL-Fish.EU)

In "Surveillance and diagnosis"

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Thank you for your attention!

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