

DTU



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24rd AW of the National Reference Laboratories for Fish Diseases, November 3rd – 4th 2020

Survey & Diagnosis of fish diseases in 2019



**European Union Reference Laboratory
for Fish and Crustacean Diseases**

NATIONAL INSTITUTE OF AQUATIC RESOURCES, TECHNICAL UNIVERSITY OF DENMARK

Survey & Diagnosis of listed fish diseases in the European Community 2019

An Annual questionnaire

1. **General data:** Number of farms and categorization
2. **Epidemiological data:** Number of outbreaks and increase/decrease in number of infected farms/severity
3. **Laboratory data, NRL and regional laboratories:** total number samples tested and samples tested positive for each disease
4. **Reports from the individual European countries:** general information on aquaculture production, fish health status, disease challenging production.



Report

- The report was collated in May, and is now submitted to all of you for validation.
- Please check if the information given is correct!



Report on Survey and Diagnosis of Fish Diseases in Europe 2019



DISCLAIMER The EURL for Fish and Crustacean Diseases and the EU commission have no liability for the accuracy of the information and cannot be held liable for any third-party claims or losses of any damages related to this report.

General production data taken from:

FEAP Data updated to 2019

Additional information on economy available EUMOFA



Prepared by the FEAP secretariat (September 2020)
contact: FEAP Secretariat - secretariat@feap.info



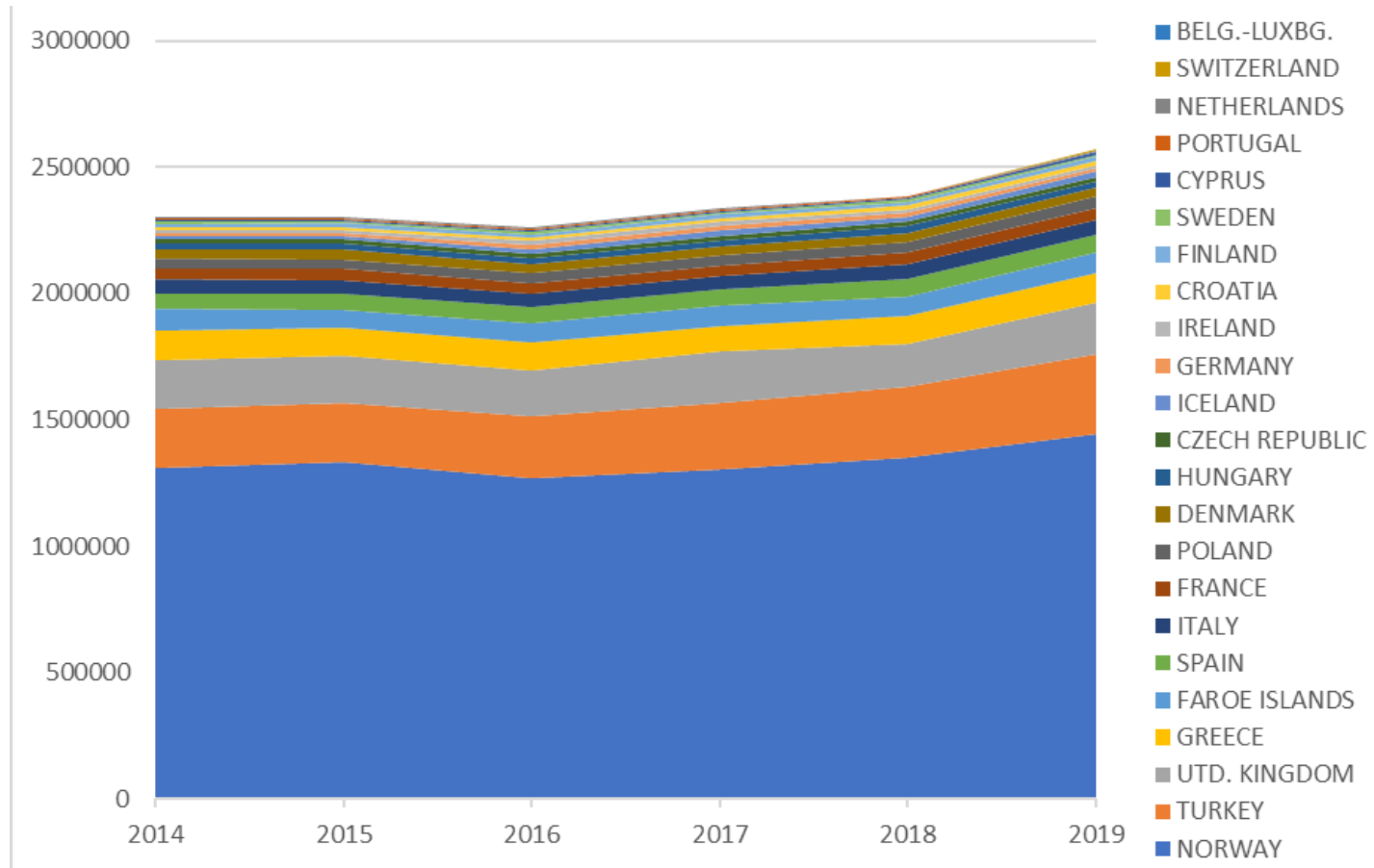
Additional relevant sources

National reports

And company reports

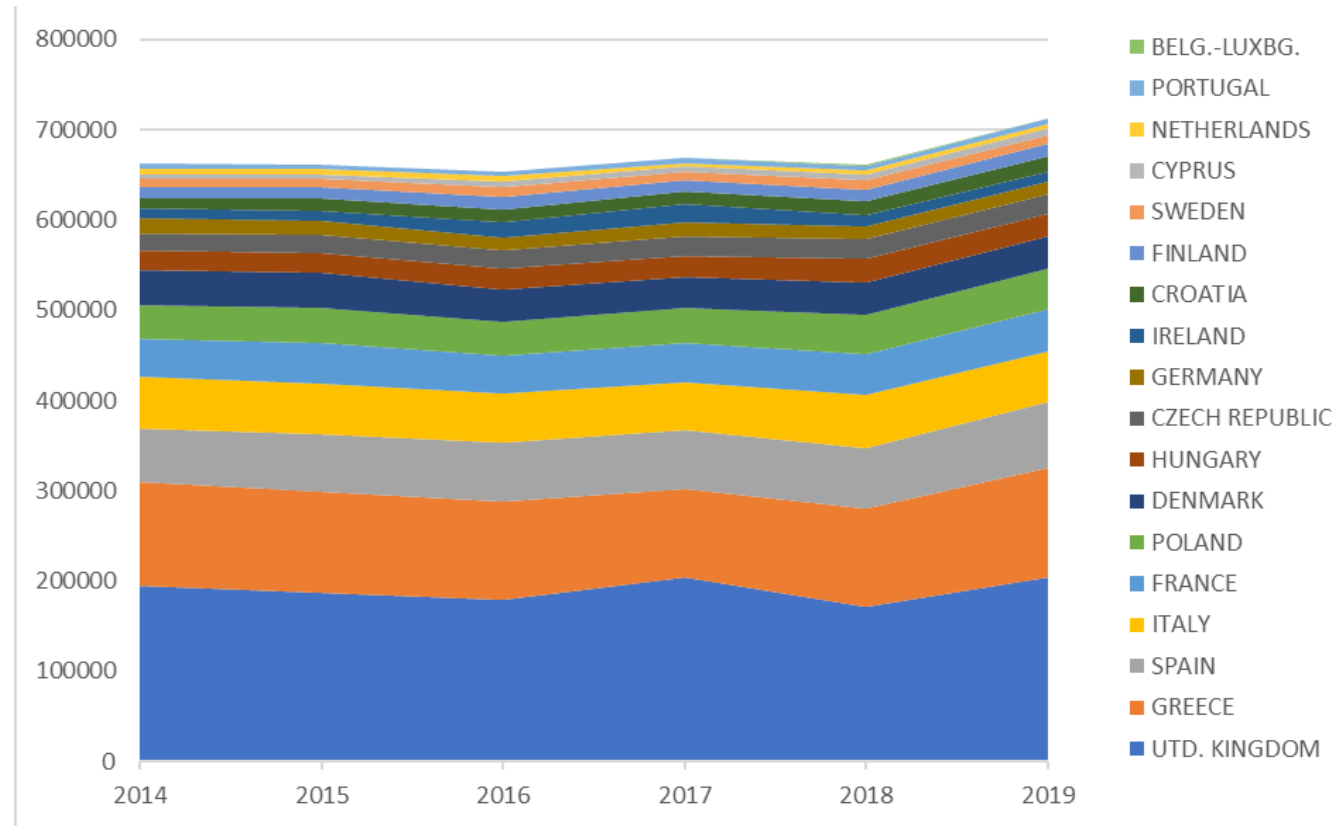


Fish Farming Production in Europe



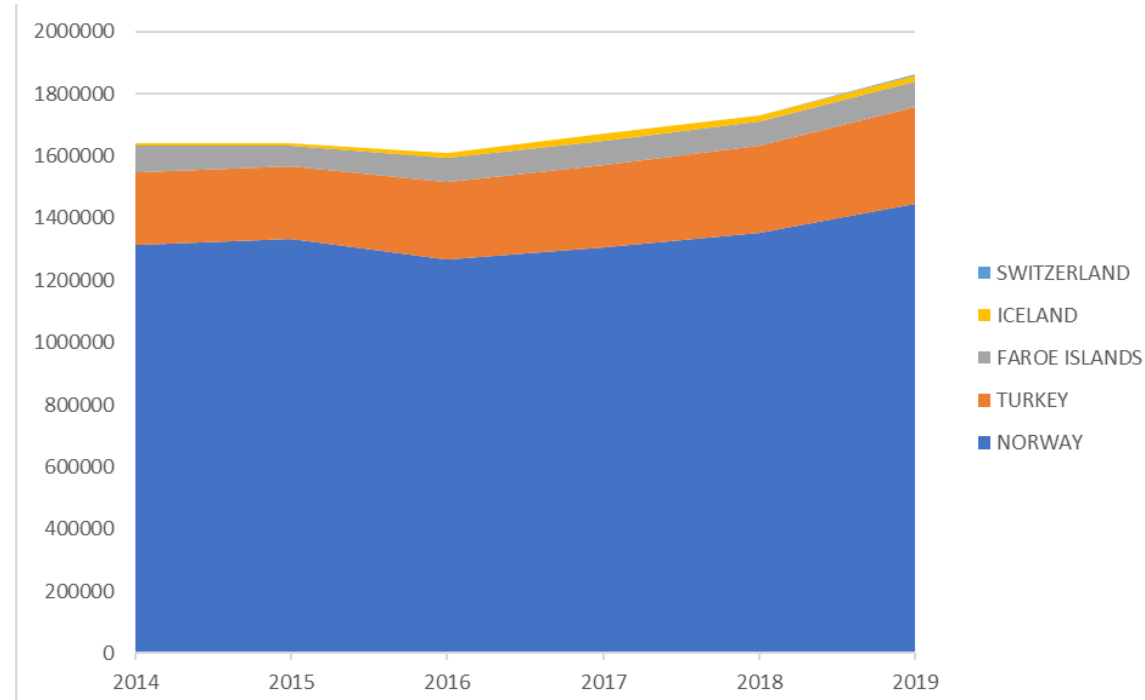
	2015	2016	2017	2018	2019
Grand Total (tonns)	2.304.172	2.264.000	2.339.717	2.390.302	2.574.333

Fish Farming Production in EU Countries



	2015	2016	2017	2018	2019
Grand Total (tonns)	661.840	653.795	668.838	660.632	712.648

Development of Fish Farming in non-EU



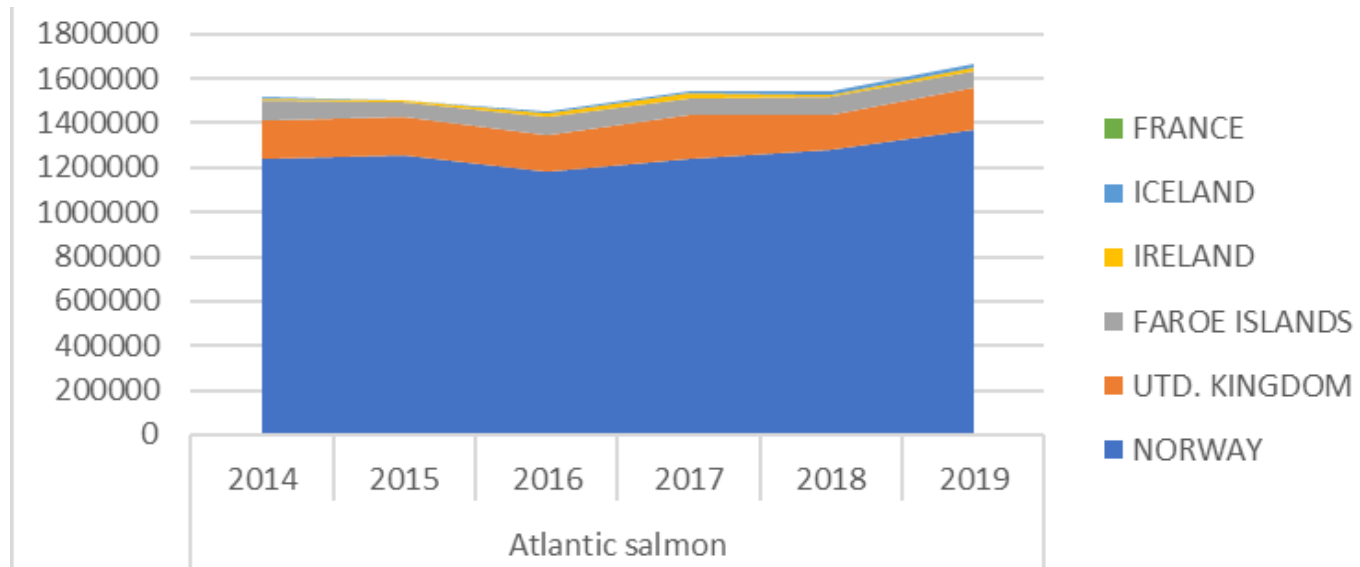
	2015	2016	2017	2018	2019
Grand Total (tonns)	1.642.332	1.610.205	1.670.879	1.729.670	1.861.685

Atlantic Salmon (*Salmo salar*)

Production (tons)	YEAR					
SPECIES	2014	2015	2016	2017	2018	2019
Atlantic salmon	1516290	1505263	1450833	1543683	1544390	1664541



Increased production in Norway, Scotland (+ 47000 tonns), Faroe, Iceland, France
 Not reported niche production in DK, Sweden, Switzerland,



PORTION-SIZE TROUT (ONCORHYNCHUS MYKISS)

Portion-size Trout production (tons) 2014-2019

Reduction in production in Turkey, Italy and Poland



Production (tons)	YEAR					
SPECIES	2014	2015	2016	2017	2018	2019
Portion Rainbow Trout	247427	243872	233345	231954	251702	225200

LARGE RAINBOW TROUT (ONCORHYNCHUS MYKISS)

Large Rainbow Trout production (tons) 2014-2019



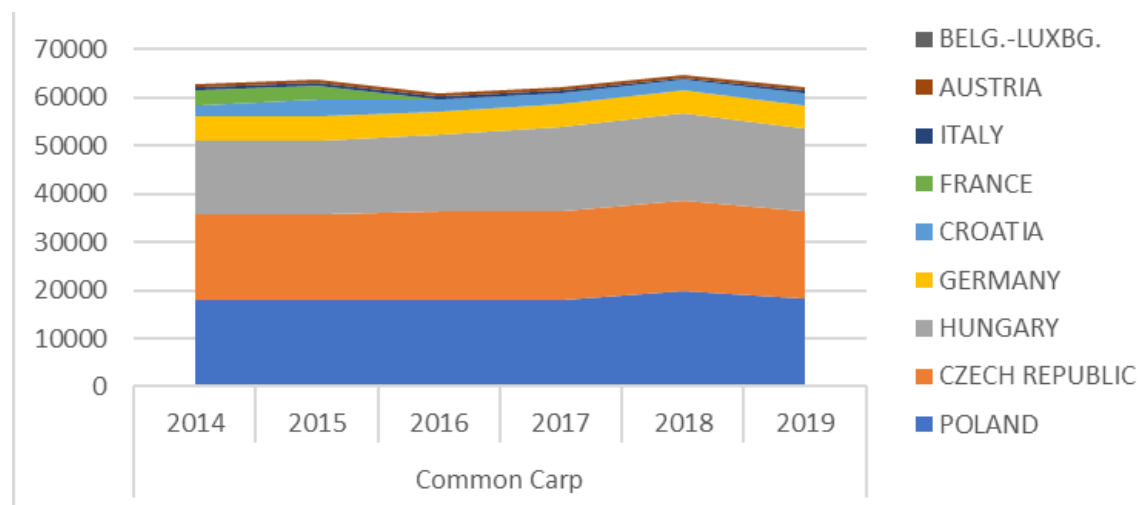
Production (tons)	YEAR					
LARGE TROUT	2014	2015	2016	2017	2018	2019
Grand Total	133169	139348	152350	132759	138644	160165

COMMON CARP (CYPRINUS CARPIO)

Common Carp production (tons) 2014-2019



Production (tons)	YEAR					
SPECIES	2014	2015	2016	2017	2018	2019
Common Carp	62715	63723	60944	61977	64739	62037



EUROPEAN SEABASS (DICENTRARCHUS LABRAX)

Seabass production (tons) 2014-2019

Tonns of fish produced

Production (tons)	YEAR					
SPECIES	2014	2015	2016	2017	2018	2019
Sea Bass	147982	157851	157694	164631	159869	208197
TURKEY	74653	77000	72342	84000	75000	105000
GREECE	42000	45000	46000	44000	45500	55200
SPAIN	17376	21324	23445	21269	22460	27335
ITALY	6500	6450	6800	5600	7300	7000
CROATIA	3215	4075	5310	5616	6220	6089
CYPRUS	1817	1725	1442	1500	1500	5000
FRANCE	2021	1980	1928	1945	1433	2123
PORTUGAL	400	297	427	701	456	450

Thousands of juveniles produced

Sea Bass	492044	510942	539367	607603	631822	545021
TURKEY	178000	220000	242500	281000	290000	200000
GREECE	175000	175000	180000	191000	182000	173000
FRANCE	48382	55575	43437	40994	42753	57777
SPAIN	43328	24903	34129	46109	66569	55244
CROATIA	1000	1000	10000	15000	17500	16000
CYPRUS	4334	6964	3301	3500	3000	3000

Large increase in production in Turkey (+ 30.000 T) but severe decrease in juvenile production ? (export/ increased efficiency?)

GILTHEAD SEABREAM (SPARUS AURATA)

Seabream production (tons) 2014-2019

Tonns of fish produced

Production (tons)	YEAR					
SPECIES	2014	2015	2016	2017	2018	2019
Sea Bream	146053	147336	160056	158364	182181	199476
TURKEY	41873	48000	67612	72000	83000	99000
GREECE	71000	65000	59000	51000	61000	65300
SPAIN	16230	16231	13740	13643	14930	13521
ITALY	8200	7360	7600	9000	9700	9100
CROATIA	3655	4488	4101	4830	5591	6774
CYPRUS	2919	3656	5136	5000	5000	2500
FRANCE	1105	1502	1671	1853	1879	2081
PORTUGAL	1071	1099	1196	1038	1081	1200

Thousands of juveniles produced

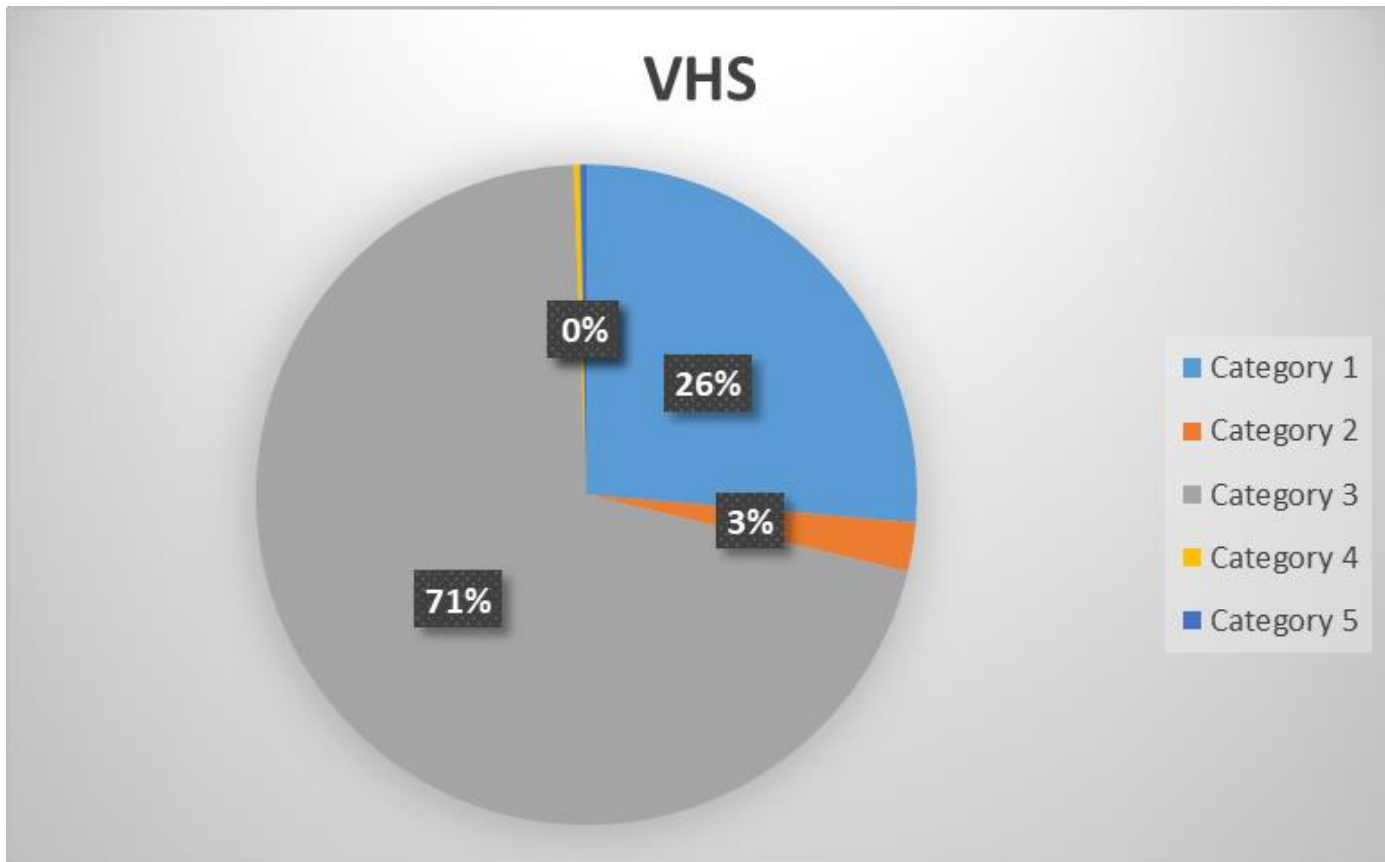
Production (tons)	YEAR					
SPECIES	2014	2015	2016	2017	2018	2019
Sea Bream	589477	546687	700227	707453	685275	701511
TURKEY	149000	120000	214000	234000	230000	240000
GREECE	237000	245000	268000	256000	250000	238000
ITALY	67000	60000	75000	80000	70000	90000
FRANCE	47103	54510	68783	65624	56600	55115
SPAIN	65786	39250	43254	36629	37475	36396
CYPRUS	23588	27927	27190	27200	27000	27000
CROATIA	0	0	4000	8000	14200	15000

Other species of relevance in European aquaculture

- Salmonids (Arctic charr – 6915 tonnes in 2019)
- Sturgeon (166 tonnes of caviar produced in 2019)
- Halibut (1594 tonnes)
- Turbot (11423 tonnes)
- Cleanerfish for sea lice mitigation (22.5 million fish farmed in Norway)

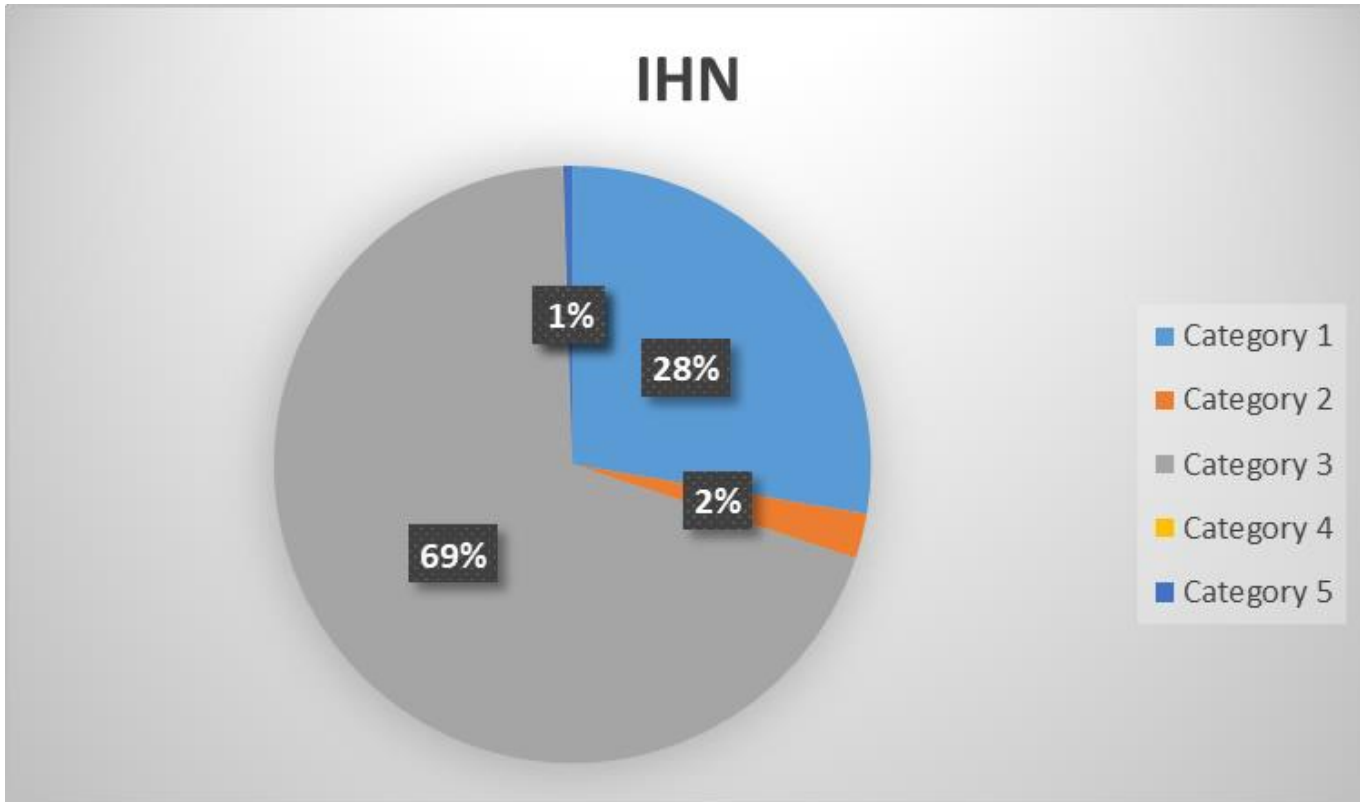


Distribution of farms in zones and compartments according to category for VHS including 13.000 farms with susceptible species



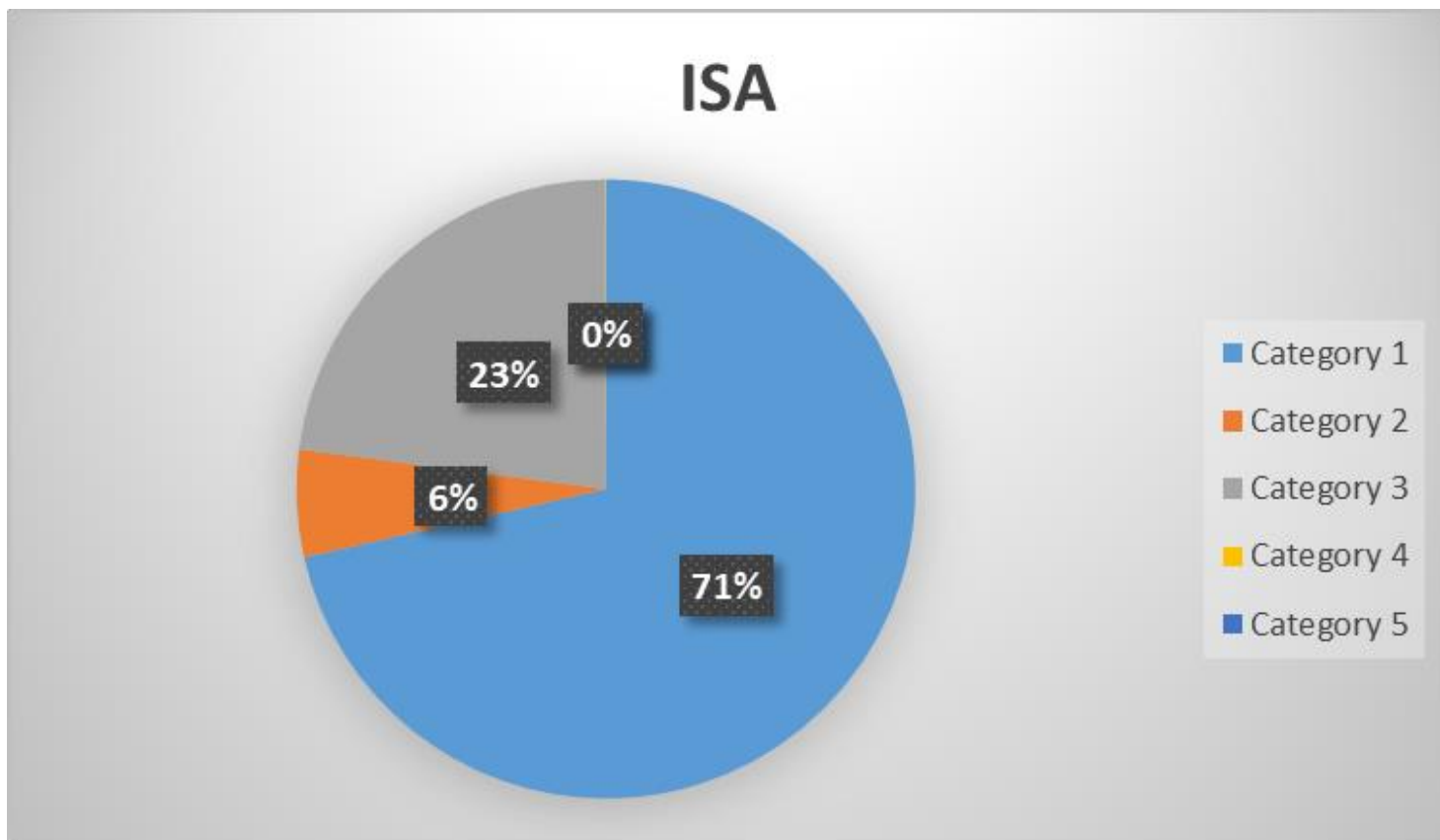
Category	# farms
1	3426
2	310
3	9183
4	41
5	40

DTU Distribution of farms in zones and compartments according to category for IHN including 12601 farms



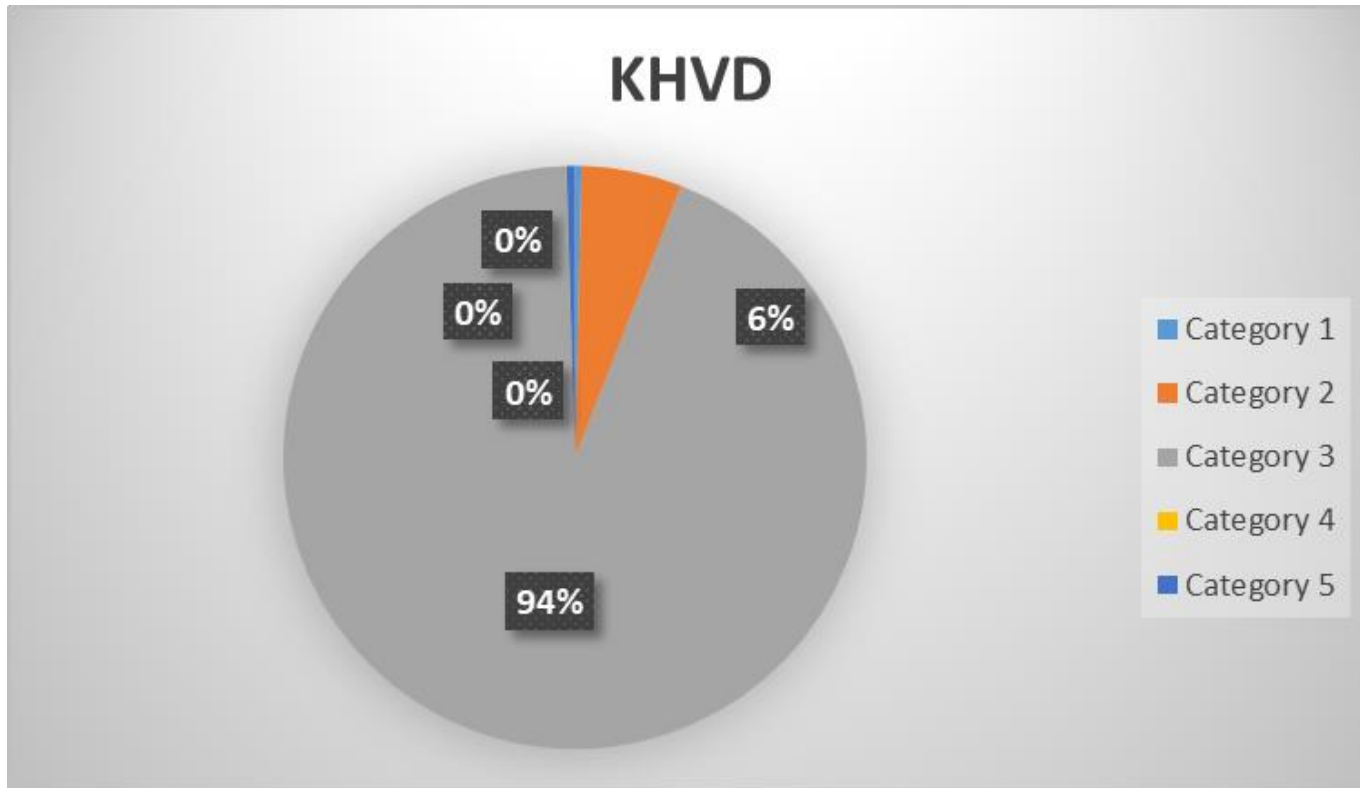
Category	# farms
1	3484
2	307
3	8742
4	4
5	64

Distribution of farms in zones and compartments according to category for ISA including 6666 farms with susceptible species



Category	# farms
1	4763
2	373
3	1528
4	2
5	0

Distribution of farms in zones and compartments according to category for KHV including 10871 farms with susceptible species



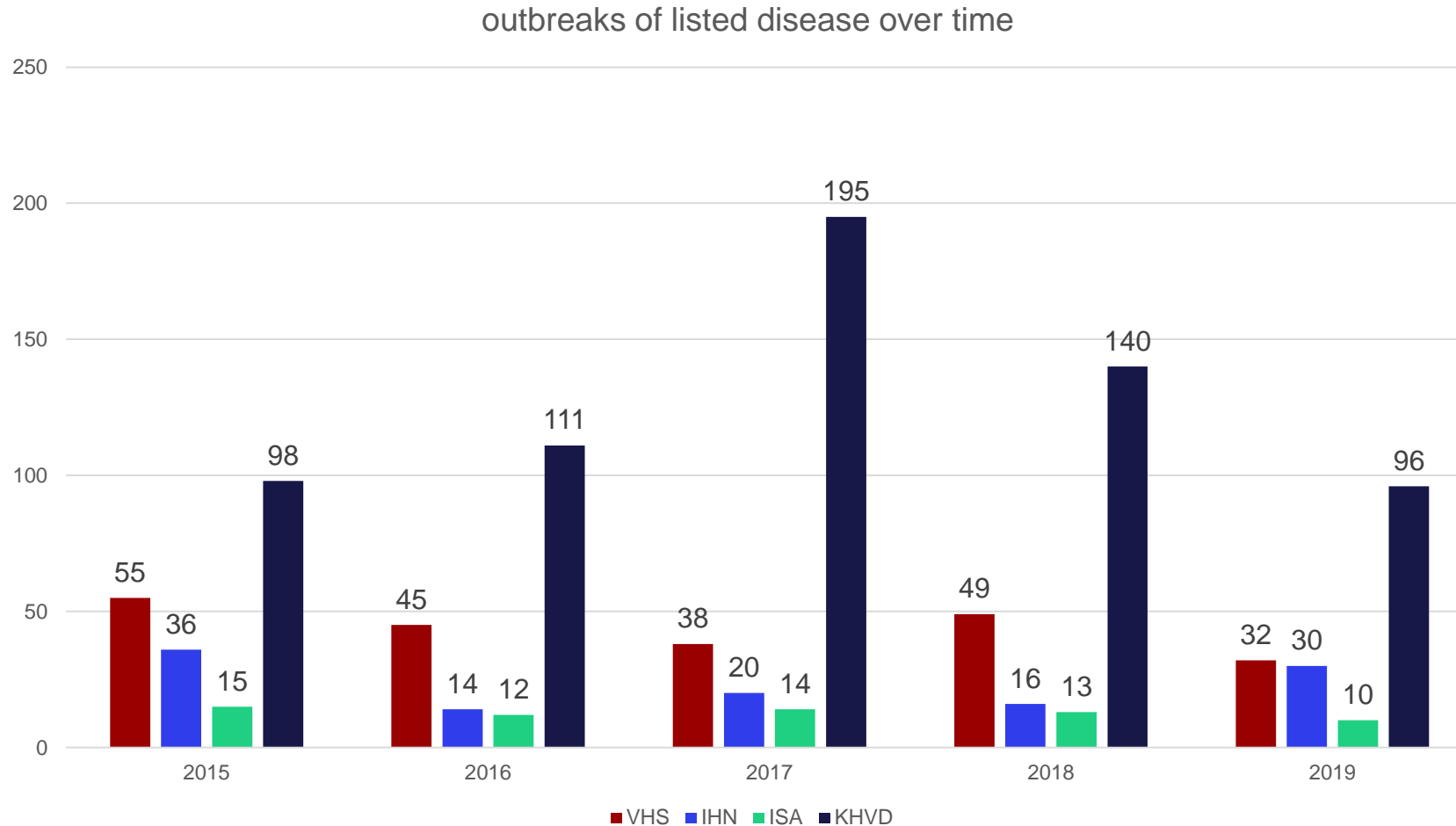
Category	# farms
1	40
2	373
3	1528
4	2
5	50

New health categorization to be implemented Regulation 2020/689

- There will be no more cat. III (expected to be transient status)

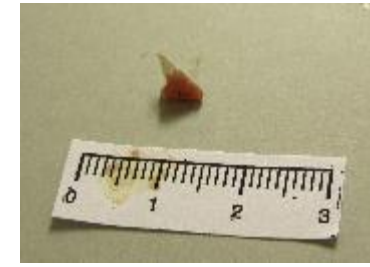
Health Category	Health status	Intro from	Dispatch to
I	Approved Disease Free	I	I, II, III
II	Approved Eradication program (surveillance or eradication program)	I or II 6 year max	II, III
III	Non approved disease free	I-II	III

Reported outbreaks of listed disease



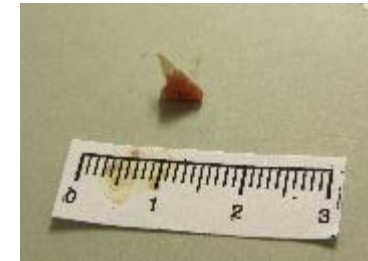
Disease outbreaks - VHS

- 32 outbreaks reported in 2019
 - 13 reported in Germany ; situation developing depending on the Lander
 - 2 reported in France during sampling for surveillance/eradication – no clear symptoms reported
 - 1 outbreak in Switzerland
 - 1 outbreak in Italy
- Despite the long history of implementation of eradication programs, IHNV and VHSV are still persistent in Italy, causing recurrent disease outbreaks. Italy at present there are **16 VHS** and 14 IHN **infected farms**. In 2020 Vaccination for VHS/IHN project started in Italy in 2020 (see presentaion from Andrea Marsella later on).



Disease outbreaks - IHN

- 30 outbreaks reported
 - 20 in Germany – sharp increase of farms infected with IHNV especially in South Württemberg; also affected were several farms that were previously disease-free with regard to IHN
 - 1 outbreak in Switzerland
 - 1 outbreak in Italy – perceived higher virulence of IHNV
- Despite the long history of implementation of eradication programs, IHNV and VHSV are still persistent in Italy, causing recurrent disease outbreaks. In Italy at present there are 16 VHS and **14 IHN infected farms**. In 2020 Vaccination for VHS/IHN project started in Italy in 2020 (see presentation from Andrea Marsella later on).



Disease outbreaks - ISA

- 10 outbreaks reported in Norway. Situation in fast development in 2020.
- New diagnostic manual drafted in 2020 by EURL in collaboration with expert working group (Knut Falk, Debes Christiansen, Eann Munro, Ole Bendik Dale – and EURL team) Being discussed by MS at the moment
- See presentation from Ingunn Sommerset (NVI) later on



Disease outbreaks - KHV

- 96 outbreak reported
- 49 in Germany
- 17 outbreaks in England in 2019, all in recreational coarse fisheries (one of the 17 was a recurrence of clinical KHV), no outbreaks in farms.
- 1st outbreak in Norway



Pics from CEFAS
Gov.uk



Other fish diseases problems in *Atlantic salmon* Company perspective



MAIN CAUSES OF REDUCED SURVIVAL

	INFECTIOUS		NON-INFECTIOUS	
	FISH NUMBERS	BIOMASS	FISH NUMBERS	BIOMASS
1	Wounds	CMS	Treatments	Treatments
2	CMS	Wounds	Poor performers	Poor performers
3	Gill infections	Gill infections	Environmental	Environmental
4	HSMI	PD	Physical damage	Physical damage

Mowi report 2019 – all sites world

Mowi report 2019

RESULTS

In 2019 the Group achieved 98% average monthly survival (% biomass) in seawater. As a result of our on-going efforts to reduce the risk of infectious diseases, these accounted for 32% of the total number of fish lost during the year. The remaining 68% were lost to non-infectious causes. Compared with 2015, biomass and numbers lost to Salmonid Rickettsial Septicaemia (SRS) in Chile have been reduced by 73% and 75% respectively. Losses associated with Cardiomyopathy Syndrome (CMS), Pancreas Disease (PD) and Amoebic Gill Disease (AGD) were reduced by 41%, 29% and 68% respectively in 2019 compared with 2018.

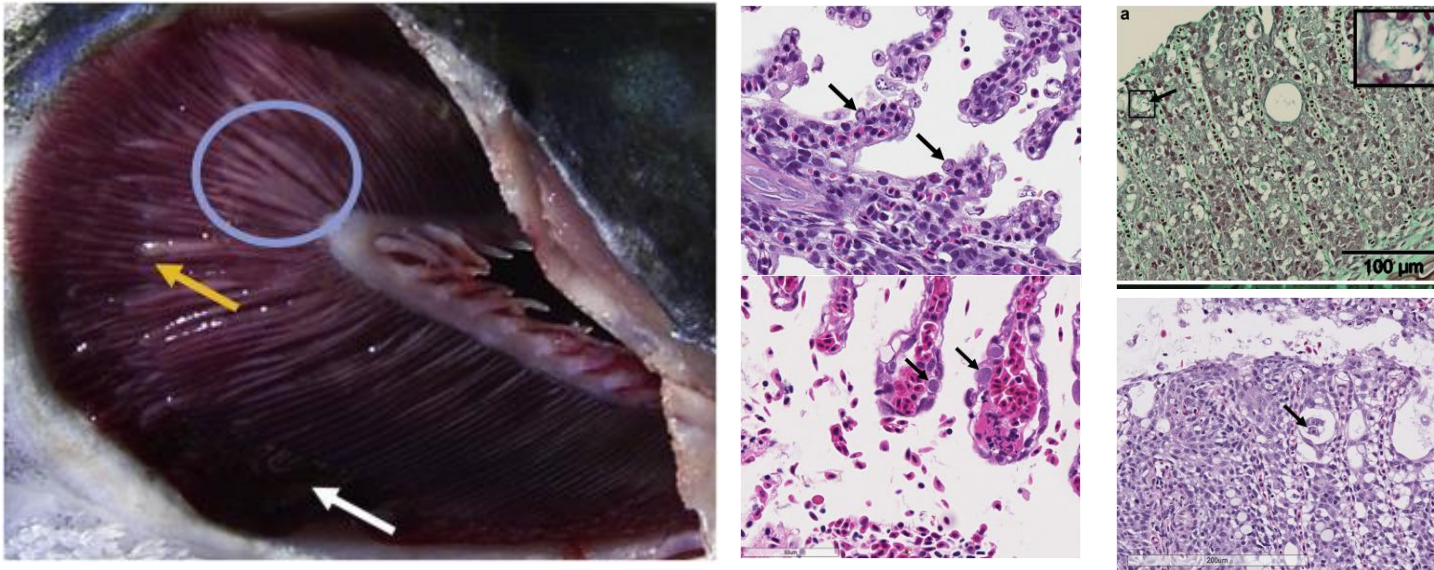
Relative to 2018, losses to wounds, Heart and Skeletal Muscle Inflammation (HSMI), sea lice treatment, gill infections and poor performers increased in 2019. This was partly attributed to additional fish handling to address the sea lice challenge. While we observed an increase in losses associated with wounds, downgrading due to wounds (as % of HOG) was reduced in 2019. Extraordinary environmental conditions on the east coast of Canada contributed to non-infectious mortality in 2019. Despite continuing to apply our strict risk management approach to Infectious Salmon Anaemia, **four cases were recorded in Norway** in 2019 (2017 - 3; 2018 - 1). **While CMS and PD losses were reduced, these, along with sea lice treatment losses and gill infections, remain our priority focus areas for improvement**

Other fish diseases problems in Europe

Atlantic salmon



- In **salmon** farming it is **sea lice** (and its treatment!), **PD** pancreas disease, **HSMI** heart and skeletal muscle inflammation, **CMS** cardiomyopathy syndrome , **AGD** amoebic gill disease and **CGD** complex gill diseases (amoebic gill disease, salmon gill poxvirus, *Paranucleospora theridion* etc..). Ulcers (*Moritella* and *Alivibrio*).
- *Pasteurella skyensis* associated with disease in Scotland and Norway



Herrero et al.,2018



Other fish diseases problems in Europe

Atlantic salmon

- Non infectious disease caused by algal/jelly bloom reported in Norway and Ireland.

“About eight million farmed salmon have suffocated in northern Norway over the past week as a result of persistent algae bloom, an industry body estimated on Thursday, a blight that some experts suggest has been aggravated by climate change.

Norway is a dominant producer of farmed salmon, and the economic impact of the bloom is significant.

A [statement from the Norwegian Directorate of Fisheries](#) **estimated the amount of salmon lost at 11,600 metric tons, worth about 720 million kroner, or more than \$82 million. An industry group, the Norwegian Seafood Council, suggested the total could be much higher.**

“Preliminary numbers point to eight million dead fish — corresponding to 40,000 metric tons of salmon that won’t reach markets,” Dag Sorli, a spokesman for the council, said in an email on Thursday. He put the value of the losses at 2.2 billion kroner.”

<https://www.nytimes.com/2019/05/23/world/europe/salmon-norway-algae-bloom.html#:~:text=About%20eight%20million%20farmed%20salmon,been%20aggravated%20by%20climate%20change.>



Other fish health problems in Europe

Atlantic salmon

Water quality parameters essential to be controlled in RAS systems

Home > News > 227,000 fish die in Atlantic Sapphire's Denmark RAS

227,000 fish die in Atlantic Sapphire's Denmark RAS



Atlantic Sapphire's pilot plant in Denmark. Photo: Atlantic Sapphire.

The Danish on-land salmon farm run by Atlantic Sapphire has reported the death of 227,000 fish in one of the site's grow-out systems.

Mowi has found out why all 1.5 million fish died at its hatchery

News by Stian Olsen - 23 June 2020

"The cause is complex."

At the beginning of May, SalmonBusiness reported that 1.5 million fry died in Mowi's new smolt facility in Skjervoy, on the coast of Northern Norway.

H2S

Nitrogen




New syndrome observed in wild salmon returning to the river in spring.

Unknown aetiology

Reported in many atlantic countries – see presentation from Charlotte Axen SVA - later

A multi-biomarker study on Atlantic salmon (*Salmo salar* L.) affected by the emerging Red Skin Disease in the Baltic Sea

Fabian G. Weichert¹  | Charlotte Axén² | Lars Förlin¹ | Pedro A. Inostroza¹ | Ulrike Kammann³ | Annikki Welling⁴ | Joachim Sturve¹ | Noomi Asker¹

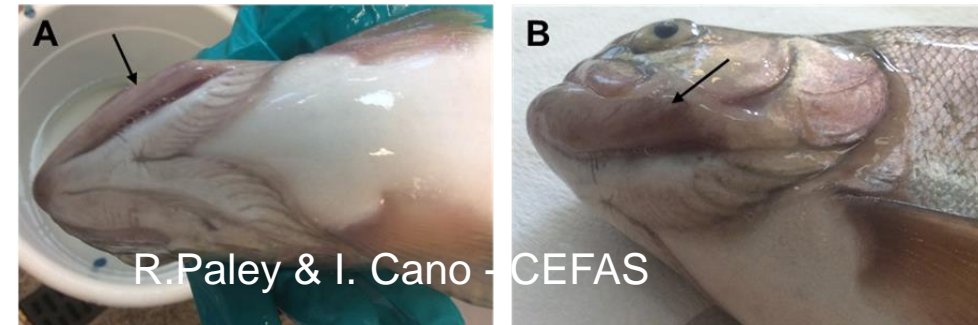
4.1 | Conclusion

In conclusion, it was shown that the emerging RSD among Atlantic salmon is associated with a significant osmotic haemodilution, an interference with the carbohydrate, specifically the glucose metabolism and alteration of the immune system. Although the inflammatory response and haemodilution are definitely disease responses, it remains to be elucidated whether the other physiological alterations seen are part of the aetiology or a disease response.

Other fish diseases problems in Europe Rainbow trout



- In **rainbow trout** the major concerns are flavobacteriosis (RTFS), bacterial kidney disease (BKD), red mark syndrome (RMS), enteric redmouth (ERM), and infectious pancreatic necrosis (IPN). Of relevance reported also lactococcosis and proliferative kidney disease (PKD)
- In England reported a cranial maxillary fibrosis (CMF)

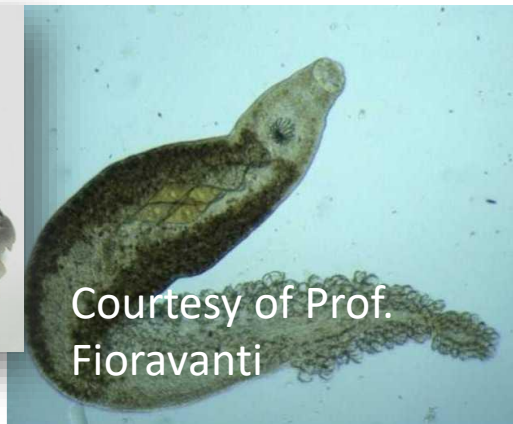


- In Denmark findings and disease outbreaks linked to PRV-3 in RAS (Juliane Sørensen presentation tomorrow)

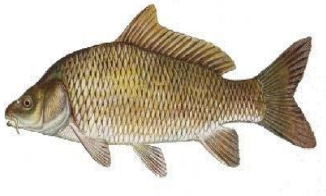
Other fish diseases problems in Europe seabass and seabream



- In **seabass** and **seabream** it is primarily VNN/VER (Re-assortant strain in Sea bream Hatcheries, *Aeromonas veronii*, Tenacibaculosis, *Vibrio harveyi* infection, *Lernathropus kroyeri* infection, Microcotylosis, *Sparicotyle* sp. , Red rash syndrome in GSB



Other fish diseases problems in Europe carp



- CEV still many new findings in Belgium, The Netherlands, Croatia, Denmark, England, Hungary, Ireland, Serbia, Italy, Czech Republic, France, Austria, Poland, Germany.
- SVCV found in Italy, Germany, Poland, Czech republic, Lithuania
- *Aeromonas hydrophila* infection and high juvenile mortality



Conclusion on S&D 2019

- Increase in production in EUROPE
- New productions (cleanerfish- RAS)
- VHS detection of virus without symptoms (France)
- IHN detection with increase of virulence
- 10 ISA outbreaks in Norway – situation in development
- 96 outbreaks of KHV (changes in upcoming legislation)
- Skin distress are problems for RT, AS, GSB
- Complex gill disease increasing importance
- Relevance of non-infectious disease (algal bloom in sea cage – water quality for RAS produced Salmon)

**Thank you for all the significant work,
efforts and time used for compiling
these data!!**

And please use the report!

Thank you for
your attention!

