European Union Reference Laboratory for Fish and Crustacean Diseases
NATIONAL INSTITUTE OF AQUATIC RESOURCES, TECHNICAL UNIVERSITY OF DENMARK

Report of the

30th Annual Workshop of the National Reference Laboratories for Fish Diseases

Kgs. Lyngby, Denmark

26th of May 2026

Organized by the European Union Reference Laboratory for Fish and Crustacean Diseases,

National Institute of Aquatic Resources, Technical University of Denmark, Kgs. Lyngby

Contents

Introduction and short summary

The 30th Annual Workshop of the National Reference Laboratories for Fish Diseases was held on the 26th of May 2026. The meeting was held online.

The number of participants went over 110 from all EU member states, associated countries and Ukraine and Australia. There were four sessions with a total of 16 presentations.

The workshop was held back-to-back with the 17th Annual Workshop for National Reference laboratories for crustacean diseases and a special session for NRL in EU and EEA on the implementation of the Animal Health Law.

The scientific programme of the Annual Workshop was again this year wide and covered many interesting topics.
The workshop was opened with "Welcome and announcements" by Head of the Section for fish and shellfish diseases, Britt Bang Jensen. The scientific part was opened with the traditional Session I "Update on important fish diseases and their control", in which participants had the opportunity to present new findings from their respective countries.

Initially, Niccoló Vendramin head of EURL provided an overview of the disease situation and surveillance in Europe 2025 was provided on the basis of the results obtained from the Survey & Diagnosis questionnaire. A report compiling all information is made available for contributors on sharepoint.
Afterwards, Torfinn Moldal from Norwegian Veterinary Institute presented the fish disease situation in Norway with a detailed report available, fiskehelserapporten-2025
Then, a presentation on the fish health situation in Faroe Island was given by Debes Christiansen.
The first session was concluded with a presentation from the Dr. Snjezana Zrncic from the Croatian NRL, describing more than 30 years of surveillance and diagnostic activities in Croatia and the fruitful collaboration with the EURL for fish and crustacean diseases.

After a coffee break, we continued with session II Control and Surveillance of fish diseases in Europe. This session consisted of four talks. The first presentation was given by Dr. Anna Toffan, representative of the Italian NRL, on the surveillance of an emerging putative viral pathogen PRV-3 in salmonid farm in Italy.
Afterwards, a Jan Inge Øvrebø, researcher from Norwegian Veterinary Institute presented molecular tracing of SAV-2 outbreak by means of full genome sequencing with Oxford nanopore.
Then a recent outbreak of IHN in Switzerland was described from Nicolas Diserens from UNIBE and finally Charlotte Axen from SVA described a recent IPN outbreak affecting farms on a lake.

After lunch break, we continued with session III results from ongoing research on listed and emerging fish diseases.
The first presentation was given by Sonal Patel from Norwegian Veterinary institute describing virulence assessment under experimental conditions of 10 ISAV isolates.
Afterwards Anna Alencar from EURL presented findings and assessment of susceptibility of Rainbow trout to two EHNV isolates from Australia.
Later on, Sylvain Jodet, phd student from ANSES, described a new experimental set up to evaluate the impact of climate change on disease outbreak in the Mediterranean sea.
Next presentation from Johanna Fosse (NVI) described new studies on ISAV antigen variability which influence capability of detaching from red blood cells.

Finally, a presentation of infection with a reassortant betanodavirus in pink snapper was given by representative of the Australian Centre for Diseases Preparedness, Peter Mohr.

After a coffee break it was time for the last session IV regarding updates from the EURL for fish diseases.
In this session the EURL the training course for 2026 were advertised. A resume of the Interlaboratory Proficiency test 2025 was presented by Teena Vendel Klinge, summing up the results of the online workshop where results of the ILPT were presented and discussed by all participants, as well as the feedback on ILPT 2025 were presented. Furthermore, the EURL activities in year 2025 were presented and proposals for the EURL work plan for 2026 and 2027 were discussed. It was informed that the work plan will include tasks for both fish and crustacean diseases.

Employees from DTU Aqua that took minutes from the meeting: Argelia Cuenca, Christina Behrens Ladime, Shyam Kokkattunivarthil Uthaman, Anna Luiza Farias Alencar and Thomas Weise. Niccolò Vendramin assembled the report.
We regard this activity as a success and a great venue for knowledge sharing.
We would once again like to thank all the presenters for their great contribution, without them the meeting would not have been a success. The workshop was organized by Niccolò Vendramin and Shyam Kokkattunivarthil Uthaman, with the help from the rest of the fish disease section at the National Institute of Aquatic Resources, DTU AQUA. The Annual Workshop next year is planned to be held at end of May 2027. More details will follow.

We wish to thank all of you for participating and we are looking forward to seeing you next year.

Niccolò Vendramin

Programme

Tuesday May 26th
Annual Workshop of the National Reference Laboratories for Fish Diseases

9:30 – 9:45	Welcome and announcements *Britt Bang Jensen*
SESSION I:	**Update on important fish diseases and their control**
	Chair: Britt Bang Jensen and minutes: Tine Solvoll Tønder
9:45 – 10:15	Overview of the disease situation in Europe *Niccoló Vendramin, DTU, Denmark*
10:15 – 10:40	Overview of the disease situation in Norway *Torfinn Moldal, NVI, Norway*
10:40 – 11:00	Fish health situation in the Faroe Islands *Debes Christiansen, HFS, Faroe Islands*
11:00 – 11:20	Over 30 years of disease diagnostics in Croatia – experiences and fruitful collaboration *Snježana Zrnčić and Drazen Oraic, CVI Croatia*
11:20 – 11:40	***COFFEE BREAK***
SESSION II	**Control and Surveillance of fish diseases in Europe**
	Chair: Niccoló Vendramin and minutes: Argelia Cuenca
11:40 – 12:00	PRV-3 surveillance in Italy *Toffan Anna, IZSVe, Italy*
12:00 – 12:20	Nanopore sequencing of SAV-2 *Jan Inge Øvrebø, NVI, Norway*
12:20 – 12:40	Epidemiological background of IHN outbreak in Switzerland *Nicolas Diserens, UNIBE, Switzerland*
12:40 - 13.00	IPN outbreak in Swedish farms *Charlotte Axén, SVA, Sweden*
13:00 – 13:40	**Lunch**

SESSION III Results from ongoing research on listed and emerging fish diseases

Chair: Argelia Cuenca and minutes: Christina Behrens Ladime

13:40 – 14:00	A challenge trial including ten ISAV isolates: Infection dynamics, shedding and mortality patterns *Sonal Patel, NVI, Norway*
14:00 – 14:20	Susceptibility of European Perch and Rainbow Trout to EHNV under experimental conditions *Anna Luiza Farias Alencar, DTU, Denmark*
14:20 – 14:40	Impacts of a realistic coastal climate change scenario on the immune responses of juvenile European seabass (*Dicentrarchus labrax*) *Sylvain Jodet, ANSES, France*
14:40 – 15:00	ISAV haemagglutinin esterase sequence variation is associated with the ability to detach from red blood cells *Johanna Hol Fosse, NVI, Norway*
15:00 – 15:20	Detection of RGNNV/SJNNV reassortant betanodavirus in pink snapper *Peter Mohr, CSIRO-ACDP, Australia*
15:20 -15:45	***Coffee break***

SESSION IV Update from the EURL for fish diseases

Chair: Niccoló Vendramin and minutes: Thomas Weise

15:45 -15:55	EURL Training Courses. Topics and organization of courses 2026 *Niccoló Vendramin / Argelia Cuenca, DTU, Denmark*
15:55 -16:15	Interlaboratory Proficiency test for fish diseases 2025 *Teena Vendel Klinge and Niccoló Vendramin, DTU Denmark*
16:15 -16:35	EURL Work done in 2025, ongoing activities in 2026, plan for 2027 *Niccoló Vendramin and Britt Bang Jensen, DTU Denmark*
	Next meeting and end of 30th Annual Workshop *Niccoló Vendramin and Britt Bang Jensen, DTU Denmark*

END OF FISH WORKSHOP

SESSION I: Update on important fish diseases and their control

Chair: *Britt Bang Jensen*

Overview of the fish diseases situation and surveillance in Europe in 2025

Niccolò Vendramin, Tine Solvoll Tønder and Thomas Weise

[1]*DTU Aqua National Institute of Aquatic Resources, Kemitorvet 202, Kgs. Lyngby,*

niven@aqua.dtu.dk

Abstract

The questionnaire on Survey and Diagnosis of the listed fish diseases in Europe (S&D) for 2025 is provided by the EU Reference Laboratory for Fish and Crustacean Diseases, it is collated annually and is the only comprehensive overview of the disease situation in fish farming in Europe. The information has been made available on the EURL web site (www.eurl-fish-crustacean.eu) , where all raw data can be obtained. The questionnaire comprises 4 parts:

1. General data on aquaculture fish production: Number of fish farms, and their health status according to AHL 2016/429, and information on national surveillance programmes.
2. Epidemiological data on the disease situation in each Member State with focus on the listed diseases (information on number of outbreaks and increase or decrease in number of infected farms and severity of outbreaks) but also including other diseases of interest.
3. Laboratory data from the NRLs and other laboratories, including the numbers of samples examined, and diagnoses of fish diseases made.
4. A National report describing health and surveillance situation in general. These reports are compiled into one and can be found on https://www.eurl-fish-crustacean.eu/ .

Production data for 2024

The most update data on aquaculture production in Europe refer to 2024 on the website of Federation of European Aquaculture producers. We decided to refer to the dataset provided by FEAP .

The total fish production in aquaculture in Europe, including Turkey and Norway, remained somewhat stable from 2024 and is now at 2,898,188 t. The total production of EU countries has some fluctuations but is relatively stable with production of 518,567 tons.

The 5 non-EU countries Iceland, Faroe Islands, Turkey, UK and Norway produced 2,379,621 t and experienced a slight increase since 2023.

Number of fish farms in Europe

The total number of authorised/licensed fish farms in Europe is estimated to be about **22161** farms. This estimate may suffer some bias:

1- In some instances, put and take lakes are counted as farms
2- The figures received do not state whether a farm is active or not and whether the number accounts for registered or authorised farms
3- From some member states only partial response were received

Health status of fish farms

There are currently four possible health statuses:

1) Approved disease free
2) Under eradication/control program
3) In voluntary surveillance program
4) Non approved disease free and not under eradication/control program.

In 2024, a health status was assigned to 8454 farms with susceptible species to VHS, to 8186 farms with susceptible species to IHN, to 5074 farms with susceptible species to ISA.

Health status for VHS, 22% of fish farms are approved disease free; 16% is under eradication/control program; 15% under voluntary program; 47% is not approved disease free and not under eradication/control program

Health status for IHN, 20% of fish farms are approved disease free; 4% is under eradication/control program; 20% under voluntary program; 56% is not approved disease free and not under eradication/control program

Health status for ISA (Infection with HPRΔ ISAV), 71% of fish farms are approved disease free, 0% is under eradication/control program, 1% under voluntary program, 36% is not approved disease free and not under eradication/control program

Outbreaks of listed diseases in Europe

For **VHS**, 20 new outbreaks were reported in Europe in 2025, 2 in Austria, 7 in Czech Republic, 1 in France, 9 in Germany, 1 in Hungary

For **IHN**, 56 new outbreaks were reported. The majority was in the Republic of North Macedonia 36, followed by Germany 11, Belgium 3, Slovenia 1, Czech Republic 1, 4 in Switzerland.

For **ISA** (Infection HPRΔ ISAV) Norway reported 18 confirmed cases.

For **KHVD**, 55 outbreaks were reported in 2025, 2 in Austria, 5 in Czech Republic, 1 in Denmark, 2 in France, 31 in Germany, 5 in Hungary, 2 in The Netherlands, 5 in Croatia, 1 in Bosnia Hercegovina, 1 in Serbia

Overview of the disease situation in Norway

Torfinn Moldal, Jannicke Wiik-Nielsen, Victor Henrique Silva de Oliveira,

Julie Christine Svendsen and Ingunn Sommerset

Norwegian Veterinary Institute

torfinn.moldal@vetinst.no

Abstract

The Norwegian Fish Health Report has been published annually by the Norwegian Veterinary Institute (NVI) since 2003. Since 2020, NVI has gained access to data at site level for several non-listed diseases diagnosed at private laboratories. With these data, the occurrence and geographical distribution of important infectious diseases, such as winter ulcer, cardiomyopathy syndrome (CMS), and heart and skeletal muscle inflammation (HSMI), are reported in a representative way. The report for 2025 in Norwegian was published in March, while the English version was published in mid-May on https://www.vetinst.no/rapporter-og-publikasjoner/rapporter.

The main species in Norwegian aquaculture is Atlantic salmon. In 2025, approximately 400 million smolt were transferred to sea, and 54.8 million farmed salmon were reported dead during the sea phase of the production. The probability of a fish dying in sea during the year was 14.2% at national level. However, there was considerable geographical variation with highest probability in production area 4 in Western Norway. According to the survey completed by fish health personnel as well as inspectors and advisors in the Norwegian Food Safety Authority, non-infectious conditions were the main challenges for juvenile salmon, while complex gill disease, injuries related to delousing, viral diseases, bacterial ulcers, and algal blooms were the main challenges in sea.

Among the listed diseases, infectious salmon anaemia (ISA) was confirmed at 18 sites in 2025. Additionally, ISA was suspected at four sites including one land-based broodfish facility with a suspicion from January 2024. Several outbreaks could be linked to ISAV HPR0 in hatcheries, and there were some examples of likely transmission from neighbouring sites. There has been a notable decline for pancreas disease in recent years. In 2025, there were 44 new cases compared to 48 cases in 2024, 58 cases in 2023 and 98 cases in 2022. All cases were within the endemic area. Bacterial Kidney Disease was confirmed at one site in 2025, compared to 12 sites in 2023 and eight sites in 2024. Piscirickettsiosis was diagnosed in turbot at one site, while there was suspicion at three sites with Atlantic salmon. Francisellosis was confirmed at one site with Atlantic cod.

Higher water temperatures may contribute to greater challenges in Norwegian aquaculture. In 2025, there were nearly four thousand treatment weeks involving non-medicinal control measures against salmon lice, representing a substantial increase compared with 2024. Mechanical and thermal delousing, either applied individually or in combination, accounted for well over half of all treatments. Amoebic gill disease was diagnosed at more sites in 2025 than in 2024, and the disease was detected further north than in previous years.

Both HSMI and CMS were diagnosed at more sites in 2025 compared to 2024, and there was approximately a threefold increase in the number of detections of infectious pancreatic necrosis, which is ranked high in the survey regarding increasing occurrence in Atlantic salmon in both hatcheries and at sea sites. On the other hand, there was a slight decrease both for *Moritella viscosa* and *Tenacibaculum* spp. Pasteurellosis has been a challenge in Norwegian aquaculture since 2018,

mainly affecting Atlantic salmon in Western Norway. However, pasteurellosis was detected at several sites in production area 7 in Mid-Norway for the second year in a row.

Overview of the disease situation in the Faroe Islands

Debes Christiansen

Heilsufrødiliga Starvasstovan (HFS), Faroese Food and Veterinary Authority, Faroe Isalnds

debesc@hfs.fo

Abstarct

The total production of Farmed Atlantic salmon in the Faroe Islands reached a new milestone surpassing 100.000 tonnes for the first time in 2025. With 115.000 tonnes gutted weight the production increased 22% from last year. At the same time the annual mortality rate decreased from 14.8% in 2024 to 10.4% in 2025. One major driver for the lower mortality in marine farms has been the production of large smolt in freshwater RAS which for the first time surpassed an average weight of 500g before sea transfer. This has reduced the average marine production period from 18 to 12 months within the last decade reducing the impact from various sea site challenges including sea lice and infectious diseases. Another likely driver for the lower mortality has been the shift in treatment strategy from mainly using thermal to freshwater delousing within the last couple of years.

The main causes of mortality after sea transfer in 2025 was categorised as wounds and handling followed by poor smoltification, infectious diseases, seal attacks and accidents. Mortality related to wounds was mainly caused by *Moritella viscosia* induced winter-ulcers and wounds related to thermal delousing.

Complex gill diseases have in recent years been an increasing problem in marine farms mainly caused by AGD, *Ca*. Branchiomonas cysticola and Costia.

With the introduction of IPN-QTL eggs the impact of IPN has been reduced significantly in freshwater RAS. However, for the last couple of years, we have seen an increase in IPN in RAS concomitant with the detection of new IPNV variants suggesting that these variants can cause IPN in QTL fish.

For several years we saw no signs of HSMI despite high viral loads of PRV-1. One likely explanation was that only the low-virulent subtype of PRV-1 was circulating in Faroese aquaculture. However, within the last couple of years this picture has changed as several cases of HSMI with increased mortality have been observed both in freshwater RAS and marine farms.

CMS re-emerged in 2013 and spread to a few new sites the following years. However, this picture changed in 2018 as cases of CMS increased concomitantly with the introduction of large-scale thermal delousing. Although delousing has switched from thermal to freshwater the last couple of years this shift seems to have no effect on PMCV prevalence and minor effect on CMS.

No ISA outbreak was recorded in 2025 but the non-virulent progenitor ISAV-HPR0 is circulating in all production stages of Atlantic salmon. We have recently demonstrated that HPR0 and other pathogens can be aerosolised and thus pose a risk for introduction into land-based RAS which use high volumes of untreated air for degassing (Dhiraj *et al*., 2025 and 2026).

Over 30 years of disease diagnostics in Croatia – experiences and fruitful collaboration

Snježana Zrnčić, Dražen Oraić

Croatian Veterinary Institute, Laboratory for Aquatic Animal Diseases, Savska 143, Zagreb, Croatia

zrncic@veinst.hr

Abstract

The Laboratory for Aquatic Animal Diseases was established within the Croatian Veterinary Institute (CVI) in 1995, following a decision by the Croatian Ministry of Science and Technology and the Ministry of Agriculture to designate CVI as the national reference institution for animal disease diagnostics. At that time, no Croatian laboratory was designated as National reference laboratory. Dr. Dražen Oraić and Dr. Snježana Zrnčić, after completing their doctoral studies at the University of Zagreb, Faculty of Veterinary Medicine, Department of Biology and Pathology of Fish and Bees, were appointed to establish and lead the laboratory. Although their previous work had focused primarily on freshwater fish pathology, the increasing development of marine aquaculture in Croatia required the implementation of diagnostic activities in marine fish health. Furthermore, the requirements for a national reference laboratory, particularly those aligned with emerging EU legislation, necessitated additional expertise and institutional development. To meet these challenges, collaboration was established with leading European reference laboratories to harmonize diagnostic activities with international standards. Initial training was conducted at the EURL for mollusc diseases, where the structure and organization of the EURL network were introduced, followed by specialized education at the EURL for viral fish diseases in Aarhus, Denmark. These first contacts developed into long-term and productive collaborations that continue today, including continuous professional training for laboratory staff. Molecular diagnostic analyses supporting routine diagnostics and ILPT were initially performed in collaboration with colleagues from the Department of Virology, until the laboratory acquired its own molecular equipment and expanded internal expertise through the employment of younger researchers. In addition to participating in EURL-organized workshops on fish and crustacean diseases, EURL and CVI co-organized several important international events. In 2009, together with other partners, the *Workshop on Implementation of Aquatic Animal Health Surveillance Based on Council Directive 2006/88/EC*, supported by TAIEX, was organised in Zadar, Croatia. In 2015, the first workshop on diseases in Mediterranean aquaculture within the EAFP conference in Gran Canaria was organised, an initiative that marked its tenth anniversary last year in Heraklion. The collaboration also included joint work on important disease outbreaks, including the first Croatian outbreaks of VHSV, IHNV, KHV, as well as *Piscirickettsia salmonis* infection in European seabass.

EURL and CVI actively participated in European project proposals, one of which resulted in participation in the Horizon 2020 project *Mediterranean Aquaculture Integrated Development*, with contributions to the work package on „Health management, fish diseases, and fish welfare“. A major long-term outcome was the publication of the *Diagnostic Manual for the Main Pathogens in European Seabass and Gilthead Seabream Aquaculture*. Beyond cooperation with the EURL, collaboration with other NRLs has been equally important in both diagnostics and research.

Particularly strong partnerships were established with the Italian and Dutch NRLs, resulting in the implementation of multiple EU-funded projects. Although the founding generation is approaching retirement, the continuity of these collaborations is ensured through a highly competent younger generation of scientists. Several have already completed training visits to EURLs and are well positioned to further strengthen cooperation with EURLs and other European NRLs.

SESSION II: Control and Surveillance of fish diseases in EU

Chair: Niccolò Vendramin

High prevalence of PRV-3 in clinically healthy salmonids in Italy

Petra Drzewnioková[1]*, Romy Lucon Xiccato[1], Francesca Bruno[1], Claudia Casarotto[1], Mazzucato Matteo[1], Eleonora Franzago[1], Marica Toson[1], Niccolò Vendramin[2], Anna Toffan[1]

*[1]Istituto Zooprofilattico Sperimentale delle Venezie, Legnaro, Padua, Italy; [2] European Reference Laboratory for fish and crustacean diseases (EURLFCD) at Technical University of Denmark (DTU); *present address: Department of Public Health, University of Pavia, Pavia, Italy*

atoffan@izsvenezie.it

Abstract

Piscine orthoreovirus genotype 3 (PRV-3) is a virus that primarily affects rainbow trout and brown trout. During disease outbreaks, infected fish may develop anaemia, inflammatory cardiac lesions resembling heart and skeletal muscle inflammation (HSMI) of salmon, and eventually ascites. PRV-3 has been reported in several European countries, whereas in Italy it was detected only once, in 2017, in clinically healthy brown trout. Since then, no further evidence has confirmed the presence of PRV-3 in Italy, despite seldom testing of suspect cases. The aim of this study was then to assess the occurrence, prevalence, distribution, and genetic variability of PRV-3 in Italy.

Samples were collected between September 2023 and May 2024 from three regions of northeastern Italy representing the most important productive area for rainbow trout. Only salmonid species were included in the study. Pooled samples of internal organs (heart, spleen and kidney) were screened using a generic PRV real-time RT-PCR assay. Ovarian fluids as well as larvae were also tested upon availability. Positive samples were subsequently characterized with already published RT-PCR methods and then sequencing. The geographic distribution of PRV-3 was mapped, and risk factor analysis was performed on a subset of samples.

Of the 267 tested specimens, 37.1% yielded positive results, corresponding to 43.6% of positive farms in the investigated area. The highest positivity percentage was observed in *Salmo trutta* (49.1%; 28/57), followed by *Oncorhynchus mykiss* (38.7%; 60/155) and *Salmo marmoratus* (24.3%; 9/37). No positive results were detected in *Thymallus thymallus* or *Salvelinus alpinus*; however, the sample size was insufficient to draw definitive conclusions. Phylogenetic analysis of representative positive samples revealed that Italian PRVs all belong to group 3b, the clade predominantly associated with rainbow trout. The sequences obtained in the present study were closely related to those previously detected in Italy, suggesting that the virus is likely endemic in the region.

Most of the farms that tested positive were located in Trentino-Alto Adige, which accounted for 61 production sites (42.6% positive farms). In Veneto, the sample size was smaller (13 farms), yet the positivity percentage was markedly higher (53.8%). Friuli Venezia Giulia had the lowest number of tested farms (4), which may partially explain the lower percentage of positive locations (25%) and suggests that the results may not be representative of the region. No clinical signs of disease or records of mortality were observed in positive fish batches. Apparently healthy wild fish also tested positive. Further research will be essential to investigate the possible presence of

subclinical conditions. None of the risk factor evaluated was found associated with the presence of PRV in the subset of farms analysed.

These findings indicate that PRV-3 is widespread in both farmed and wild salmonid populations in the study area and does not appear to be associated with specific health problems under current Italian farming practices or natural environmental conditions. Moreover, this represents the first documented case of PRV-3 infection in *Salmo marmoratus*, one of the most important endemic salmonid species in Italy.

Tracing the Spread of SAV2 to the Helgeland Coast in 2023

Jan Inge Øvrebø, Hilde Sindre, Hege Løkslett, Torfinn Moldal, Monika Hjortaas

Norwegian Veterinary Institute

jan.inge.ovrebo@vetinst.no

Abstract

Salmonid alphavirus (SAV) causes pancreas disease (PD) in Atlantic salmon (Salmo salar) and represents a major challenge for salmon aquaculture in Northern Europe due to its impact on fish welfare and production. In Norway, PD outbreaks are associated with two SAV subtypes, SAV2 and SAV3, which exhibit distinct geographic distributions. While SAV3 predominates along the southwestern coast, SAV2 has been restricted to Mid-Norway. After several years without PD cases north of the established PD zone, SAV2 was detected in 2023 at four aquaculture sites along the Helgeland coast.

Advances in whole-genome sequencing have improved resolution of SAV transmission dynamics and enable discrimination between local viral persistence and new introductions. Although long-distance spread is largely attributed to industry-related activities such as fish movements, the relative roles of environmental transmission and local reservoirs remain unclear. The introduction of SAV2 in the Helgeland region therefore provides an opportunity to investigate the spread of PD at the northern limit of its known distribution.

Results of the investigation into these new detections and comparisons with SAV2 from other geographical areas will be presented.

Question: Is it possible to document the presence of the weal boats and their movements in the area? So you could correlate with the sequencing results.

Answer: It is known that the weal boats are moving among areas; however, not all the isolates have been sequenced, so it is premature to pinpoint one of the boats/movements at this stage.

A not-so-good old friend – report of an IHN outbreak in a Swiss aquaculture facility

[1]Nicolas Diserens, [1]Heike Schmidt-Posthaus, [2]Heike Schütze

[1]Institute for Fish and Wildlife Health, Vetsuisse Faculty, University of Bern, Bern, Switzerland

[2]Friedrich-Loeffler-Institute, Federal Research Institute for Animal Health, Insel Riems, Germany

nicolas.diserens@unibe.ch

Abstract

Rainbow trout (*Oncorhynchus mykiss*) from a Swiss organic fish farm were sent to the Institute for Fish and Wildlife Health, University of Bern for parasitological, bacteriological and pathological examinations, due to chronic, slight increase in mortality.

No parasites were detected. Bacteriological cultures revealed presence of flavobacteria on gills and spleen. The histological examination revealed multifocal small to large areas of necrosis in the liver parenchyma and in the haematopoietic tissue of the kidney. As these findings could be indicative for a viral infection, e.g. infectious haematopoietic necrosis virus (IHNV), molecular biological tests were performed, which yielded positive results for IHNV in this first screening.

A total of 390 fish were examined per qPCR during the subsequent epidemiological investigation. The results revealed that different parts of the facility, each constituting clearly distinct epidemiological units, were affected.

The phylogenetical analysis conducted at the Federal Research Institute for Animal Health, Friedrich-Loeffler-Institute, Germany revealed that the isolate clustered in a group of IHNV isolated in Switzerland in an organic fish farm in 2014 and in an aquaculture facility in 1993 and 1996, fish farm, which was transformed later into organic status. These findings suggest that this strain has been circulating in Swiss organic fish farms for many years, whilst remaining undetected by the competent authorities. In the current outbreak, investigation of contact facilities has not identified the source of the virus. However, it should be considered that an insufficient number of animals were tested on these fish farms to yield conclusive results.

This case illustrates the diagnostic value of histopathology in the detection of mainly chronic cases of IHN and highlights the inherent limitations of passive surveillance systems for disease control, as is the case in Switzerland. It further underscores the importance of examining an adequately representative sample size per epidemiological unit.

Comment: Within the EU regulations is generally recommended that listed diseases should be ruled out in cases of unexpected mortality in farms. This could be taken into consideration in Switzerland.

IPN outbreak in Swedish farms

Charlotte Axén

Statens veterinärmedicinska anstalt, SV, Sweden

charlotte.axen@sva.se

Abstract:

IPN is a notifiable disease in Sweden, where six genogroups (1, 3-7) are considered epizootic and genogroup 2 is notifiable as "other disease" but still a subject to measures upon detection. The disease is under National measures according to (EU) 2021/260, where the coastal zone is considered infected and an eradication programme is in place, and the inland zone is considered free. It is not allowed to move fish from the coastal zone to the inland zone. Surveillance is done under the umbrella of VHS and IHN surveillance in accordance with (EU) 2018/1882. Screening is performed by cell culture in accordance with the EURL diagnostic manual on VHS and IHN. Overall, approximately 3000 fish (~1500 wild broodstock + ~1500 farmed fish) are sampled for virological analysis every year. Records of notifiable diseases are kept since 1986, and in total 45 cases of IPN are registered. Of these 34 are from the coastal zone (29 from farmed fish, 5 from wild-caught broodstock), 8 from farms with imported eel, and 3 from the inland zone (2007 and 2025 in farmed fish and 2016 in a wild-caught broodstock female).

The 2025 case occurred in a cage farm in in Lake Malgomaj, Swedish Lapland. The lake is situated far upstream in River Ångermanälven, about 111 m deep and 45 km long. The lake harbours four wild salmonids: Arctic char, brown trout, grayling and whitefish. The farm has rainbow trout and Arctic char, and fish is moved there from two landbased farms within the same company.

CPE was detected in one of three pools from rainbow trout during mandatory control in October. ELISA and qPCR determined the CPE to be caused by IPNV. Follow-up sequencing identified IPNV genogroup 2, with 99.2% similarity to published Finnish isolates in comparison to approx. 94% similarity to Swedish isolates from previous outbreaks in the coastal zone.

The fish was bought as fertilized eggs from Denmark in 2024, but no Danish IPNV sequences are present for comparison. In 2023, fertilised rainbow trout eggs were bought from Finland. This fish was sampled in Malgomaj in 2024, without virus detection. In addition, both the Danish and Finnish farm are sampled for IPNV due to movement of fish.

Malgomaj is popular for recreational fishing, with many fishing tourists from Finland and the Baltic states. It is popular to fish in close proximity to the farm, probably because the farm attracts wild fish, and chumming of the water is frequently observed by the farmers. Thus, a potential infection source is chum brought from other countries. A restriction zone had to be set around the farm boundaries to force fisherman away.

Slaughter was started almost immediately after diagnosis, but had to stop due to the ice setting. Slaughter and culling of smaller fish was started as soon as the ice broke up in spring and should be done before water temperature reaches 5°C. This is followed by cleaning and disinfection of all gear, and then an empty period of 12 weeks before fish is allowed in the cages again.

No further sampling of the farm has been performed, as detection is enough for culling to be performed. The prevalence is however expected to be low, since it is not probable that more than 1-2 infected fish would end up in a single pool instead of in several pools.
The source of this case will probably never be traced. To our knowledge, no further investigations into the delivering Danish and Finnish farms have been done, and trying to identify the chum source if that is the case is not possible. The landbased company farm that harboured the eggs and juveniles only delivered fish to Malgomaj and was emptied and disinfected at delivery. Further spread if the fish was infected by vertical transmission is thus not expected. The status of the wild fish is so far unknown. At least Arctic char, brown trout and whitefish are susceptible to IPNV. Wild fish will potentially be sampled during the summer/autumn of 2026. If the wild fish has become infected, how many of them have been caught with potential of equipment contamination and further spread, what will the effects on the wild fish populations be and how long will it then take before the farm again is re-infected? This case also raises the question whether legislation about a year-around restriction zone around cage farms, unrelated to health status, should be in place.

Question: Is milt also tested? Or only ova?

Answer: No, only ova.

Comment: Low-prevalence IPNV are a challenge for the industry, as they usually mention that the farmers are buying IPNV-free eggs but still getting IPN. We need to help the industry with this problem. We test all the wild broodstock, but we don’t have good surveillance for the broodstock in the farms, as they are too valuable (and they will need to be destroyed if IPNV is detected).

SESSION III: Result from ongoing research on listed and emerging fish diseases

Chair: Argelia Cuenca

A Standardized bath challenge trial including ten ISAV isolates: Infection dynamics, shedding and mortality patterns

Sonal Patel, Ole Bendik Dale, Johanna Hol Fosse, Torfinn Moldal, Bjørn Spilsberg, and Simon Weli

Norwegian Veterinary Institute, Norway

sonal.patel@vetinst.no

Abstract

Infectious salmon anaemia (ISA) is a serious infectious disease of Atlantic salmon caused by the orthomyxovirus Isavirus salaris (ISAV). ISA outbreak mortality varies widely, with a range of environmental and host factors obscuring potential virus-specific contributions to this variability. Experimental challenge studies are few but indicate that ISAV-HPR deleted strains may vary considerably in virulence. The aim of this study was to compare the virulence of a panel of recent Norwegian ISAV isolates and generate material for future in-depth studies of the mechanistic basis of ISAV virulence, using synchronized bath challenge. Atlantic salmon (50-80 g) were challenged with ten different ISAV isolates. Two sets of ten tanks each were designated as sampling group and observational groups for each isolate, respectively. The trial was performed in a freshwater flow-through aquaculture system at 12°C, and mortality was monitored. Possible differences in mortality and pathology were investigated and used as criteria for defining virulence. The cumulative mortality in fish groups infected with different isolates ranged from 15 to 100%, suggesting considerable variability in virulence. Even isolates originating from farms with no clinical signs of ISA caused mortality, but in the lower range. Virus shedding and viral load in heart also varied between groups but did not correlate with mortality.

Q: How did you test the water? Filter? What system is it, a flow-through?

A: Fresh water – not a RAS-system, 500 ml water was collected, filtered and the filters were tested.

Q: Shares experience vaccination studies, and that vaccines have shown to reduce the amount of virus and mortality.

A: Agrees on this perspective. No complete 100% protection. Master thesis describing a case with shedding of virus after vaccination.

Comment: Vaccine will protect against disease but not infection, so virus is expected to be shed.

Susceptibility of European Perch and Rainbow Trout to EHNV under experimental conditions

Anna Luiza Farias Alencar[1*], Argelia Cuenca[1], Niccolò Vendramin[1]

1- DTU Aqua - National Institute of Aquatic Resources, Technical University of Denmark

* Corresponding author: alfal@aqua.dtu.dk

Abstract

Epizootic haematopoietic necrosis virus (EHNV) is a ranavirus responsible for high mortality events in European perch (*Perca fluviatilis*) (also commonly named redfin perch) and low severity disease in rainbow trout (*Oncorhynchus mykiss*). The disease, notifiable both at WOAH (World Health Organization for Animal Health) and the European Union, is endemic in wild redfin perch in southern Australia, and exotic to Europe. Previously, in collaboration with CSIRO (Commonwealth Scientific and Industrial Research Organisation, Australia) and DFO (Fisheries and Oceans Canada) we conducted an experimental infection trial with EHNV in both European perch and rainbow trout which were infected with 2 distinct EHNV isolates (EHNV 86/8774, isolated from rainbow trout and EHNV 24-00087, from redfin perch) by cohabitation. The infection trial showed that there is a significant difference in host susceptibility. Where there was no development of disease or reduced survival in rainbow trout challenged in this study, IP-injected European perch developed clinical signs of disease and showed survival of 73% in both isolates. Previously it has been suggested that European stocks of perch may be less susceptible to EHNV than Australian stocks and our study corroborate with that. With regards to WOAH's current assessment of species susceptibility, our study supports the consensus that rainbow trout shows low susceptibility to EHNV, which is usually influenced by environmental factors or concomitant infections. The outcome from this study is contributing to a better understanding of EHNV in both species and to the development of better diagnostic tools for this disease.

We would like to thank David Cummins, Lachlan Coff, Nick Moody and Peter Mohr from CSIRO for participating in the infection trial, the fruitful scientific discussions and for providing the virus isolates. We would also like to thank Laura Hawley and Kyle Garver from DFO for the fruitful scientific discussions.

Q: What was the temperature of the water?

A: 18 degrees in the water.

Comment: The other Danish study used 20 degrees – perhaps these two degrees are very important, and is worth taking into account.

Q: What cell lines do you use to replicate the virus?

A: BF-2

Q: Do they replicate in RBT? Like RTG-2? This is perhaps worth testing.

Comment: The temperature would greatly influence the host-pathogen interaction, esp immune response.

Comment RTG-2 cell line can be used to culture EHNV isolates.

Q Thanks for the info. do you know/think it could change virulence to rainbow trout if the EHNV isolates had been adapted to RTG-2?

A: I don't think the research undertaken so far with EHNV by various laboratories has focussed on cell line adaptations during culture influencing virulence in vivo.

Comment: we can test that sometime.

Impacts of a realistic coastal climate change scenario on the early immune response of juvenile European seabass (*Dicentrarchus labrax*) experimentally infected with Nervous Necrosis Virus (NNV)

Sylvain Jodet[1,2], Morgane Danion[1], Lenaïg Louboutin[1], Guillaume Lannuzel[1], Pauline Pondaven[1], Noor Floch Müller[1,2], Dominique Hervio-Heath[2], Arianna Servili[2], Victor Simon[2], Thierry Morin[1], David Mazurais[2]

[1] *ANSES, Ploufragan-Plouzané-Niort Laboratory, Unit Virology, immunology and ecotoxicology of fish, National infrastructure of research EMERG'IN, 29280 Plouzané, France*

[2] *IFREMER, Unit Ecophysiology and life history traits of marine organisms, University of Brest, CNRS, IRD, UMR 6539 LEMAR, 29280 Plouzané, France*

sylvain.jodet@anses.fr

Abstract

Coastal areas are highly vulnerable to the cumulative effects of climate change and human activities, as highlighted by the Intergovernmental Panel on Climate Change (IPCC). Beyond ocean warming and acidification, rising temperatures and eutrophication have increased the frequency and intensity of hypoxic events. Moreover, the growing prevalence and virulence of pathogens represent major ecological and economic concerns. This study investigated the impacts of a realistic coastal climate change scenario combining ocean warming and acidification, along with a moderate hypoxic event, on the immune capacity of juvenile European seabass. Fish were subjected to an experimental infection with Nervous Necrosis Virus (NNV), a neurotropic pathogen causing behavioral abnormalities and high mortalities. European seabass were reared under two environmental scenarios: a "Current" condition reflecting present-day fluctuating temperature and pH of the bay of Brest, or a "Future" condition with increased temperature (+3°C) and reduced pH (-0.4 unit), based on IPCC SSP3-7.0 projections for 2100. After reaching ~40 g, half of the fish from each scenario were exposed to a two-week hypoxic event (50% O_2 saturation), while the remainder were maintained in normoxia. Two months after the end of hypoxia, 150 fish from all groups (Current-Normoxia, Current-Hypoxia, Future-Normoxia and Future-Hypoxia) were challenged with NNV (RG genotype) through controlled 3-hour bath immersion (1E+5 $DICT_{50}$/mL) at 27°C, and were monitored for 50 days. Final survival did not differ significantly across the four groups. However, at 96 hours post-infection, before the onset of clinical signs and mortality, the proportion of NNV-positive fish was lowest in the "Current-Normoxia" group and higher in the other conditions ($p = 0.002$ qPCR, $p < 0.001$ immunofluorescence antibody test). Among positive individuals, exposure to "Future" condition markedly increased viral RNA1 expression ($p < 0.001$, ~163.1-fold) and infectivity ($p = 0.018$, ~45.7-fold) in brain and eye tissues. Future-acclimated fish also exhibited higher lymphocyte mortality ($p < 0.001$, ~1.8-fold) and greater proportions of phagocytic cells ($p = 0.003$, ~1.5-fold) in blood, suggesting an altered early cellular immune response associated with enhanced viral replication. Ongoing analyses will further clarify the molecular mechanisms underlying fish immune response under future climate conditions.

Q: Which genotype of nodavirus did you use?

A: NNV RG genogroup. The most common type.

Q: Would the temperature increase of a few degrees change how the fish deals with the virus. And do you know if this can be transferred to other species also?

A: This temperature rise is sufficient to induce an altered immune response in the fish. Should be a long-term increase in temperature.

Comment: Has worked with halibut, that live at lower temperatures than seabass. Curious if the findings of altered immune response can be compared across species.

Q: 28 degrees? Is that not high for seabass.

A: Temperature was selected to mimic the 3 degrees rise in sea temperature forecasted by 2100 if climate changes come through.

Q: Challenge by injection or immersion?

A: The fish were infection by immersion bath and followed for 50 days under in groups kept under different conditions.

Q: Which genetic lines of seabass used?

A: European seabass that is tolerant to warm temperatures.

Natural sequence variation in ISAV haemagglutinin esterase influences ISAV-erythrocyte interactions

Johanna Hol Fosse[1,*], Adriana Magalhães Santos Andresen[1], Lada Ivanova[1], Frieda Betty Ploss[1], Inger Austrheim Heffernan[1], Simon Chioma Weli[1], Sonal Patel[1], Petra Elisabeth Petersen[2], Maria Marjunardóttir Dahl[2], Debes Hammershaimb Christiansen[2], Lisa Furnesvik[1], Knut Falk[1]

[1]Norwegian Veterinary Institute, 1433 Ås, Norway

[2]Faeroese Food and Veterinary Authorities, Torshavn, Faeroe Islands

johanna.hol.fosse@vetinst.no

Abstract

The ISAV haemagglutinin esterase (HE) contains both receptor-binding and receptor-destroying domains. Cellular attachment is therefore followed by removal of the virus-targeted sialic acid (Neu4,5Ac2), causing loss of ISAV binding sites in infected fish and homologous attachment interference in cell culture. The broader biological role of the ISAV esterase is poorly understood, and several aspects of ISAV receptor engagement and release remain unresolved. Although ISAV agglutinates erythrocytes from both rainbow trout and Atlantic salmon, only rainbow trout erythrocytes elute from this interaction. The mechanistic basis for this discrepancy is unknown.

Using ISAV-erythrocyte interactions to dissect receptor destruction and virion dissociation across viral genotypes and strains, we uncovered substantial functional diversity. While typical ISAV isolates from the 1990s epidemic did not permit erythrocyte elution, North American genotype and a subset of European genotype isolates did. HE residues 229 and 230, rimming the P1 esterase pocket, were key determinants of this permissiveness. Elution further required an active esterase catalytic triad. Atlantic salmon infected with ISAV carrying the elution-permissive 229N variant showed earlier loss of Neu4,5Ac2 and a more rapid decline in the proportion of ISAV-bound erythrocytes. Irrespective of strain, the loss of Neu4,5Ac2 preceded the reduction in ISAV-bound erythrocytes by several days, indicating that Neu4,5Ac2 removal alone is insufficient to trigger virion release. Targeted sialic acid analyses revealed similar levels of erythrocyte Neu4,5Ac2 in Atlantic salmon and rainbow trout. In addition, only Atlantic salmon erythrocytes expressed a di-O-acetylated sialic acid variant with unknown ISAV binding capacity.

Our findings give insight into viral and host determinants of ISAV receptor interactions. We demonstrate functional diversity within the ISAV esterase and link virion binding and release to salmonid erythrocyte sialic acid composition. Finally, the delay between receptor loss and virion dissociation supports the existence of additional erythrocyte attachment factors, which may contribute to ISAV pathogenesis.

Q: Have you considered whether expanding the number of samples, to see if the HE binding- and destroying domains could be a marker for virulence?

A: Both elusion permissive and restrictive ISAV types have different virulences. Would need two otherwise similar isolates, as the HE is not an absolute marker for virulence.

Q: Why would the virus cut off its receptor?

A: Happens both in endothelial cells and RBCs. Looking at how the virus binds. Dynamic interaction; bind and release continuously. The receptor-loss is early. When you enter a cell, you do not want another virus to enter the cell, as the virus will be more stable (not prone to recombination with other virus genome material). Gives an example of influenza-virus that cannot destroy their own receptors and therefore will be stuck once bound.

Detection of RGNNV/SJNNV reassortant betanodavirus in pink snapper

Peter Mohr

CSIRO, Australian Centre for Disease Preparedness

Peter.Mohr@CSIRO.au

Abstract

The red-spotted grouper nervous necrosis virus (RGNNV) genogroup of betanodavirus has previously been isolated from finfish from several Australian states on the east coast. In 2024, routine translocation surveillance testing of healthy pink snapper by the Department of Primary Industries and Regional Development, Western Australia, detected a betanodavirus by real-time PCR. A virus was isolated on the E11 finfish cell line from pink snapper samples referred to the Australian Centre for Disease Preparedness (ACDP). The RNA1 segment of the virus was of the RGNNV genogroup and the RNA2 segment was of the striped jack nervous necrosis virus (SJNNV) genogroup. This was the first time that an RGNNV/SJNNV reassortant betanodavirus had been detected in Australia. Deficiencies were identified in current conventional PCR assays for detection of betanodavirus at ACDP, and new assays were developed and evaluated.

Q: What temperature were the pink snappers in? And what temperatures were the cell cultures kept at?

A: Unsure of the conditions at the origin of the pink snappers. SSN cell line was grown around 25 degrees as a standard for nodavirus.

Q: Interesting that there were no clinical signs in the pink snapper. Unsure if mortality would come later or happen at other life-stages i.e. larvae. Not possible to follow the fish, as there was an eradication.

A: No mortality in the cohabitants from the farm.

Q: Has there been any follow up from the facility?

A: De-stocked but they are up running again. No progression of disease was observed.

Q: If you were to do a deliberate do double infection; Any preferred re-assortment?

A: RG-SJ or perhaps SJ-RG. Maybe Anna knows more about this.

Q: What system? RAS, flow-through?

A: Quite removed from the actual facility – unsure of the type of water management.

SESSION IV:Update from the EURL

Chair: Niccolò Vendramin

EURL training course for 2025

Argelia Cuenca, Britt Bang Jensen and Niccoló Vendramin

EURL Fish Diseases, National Institute of Aquatic Resources, Technical University of Denmark, Denmark

niven@aqua.dtu.dk

Abstract

In 2025, one training activity will be hosted by the EURL

A short overview of the program and the activities will be presented.

An on-site course with physical participation is planned in week 44. The course is entitled "Validation of diagnostic methods for disease diagnostic in aquatic animal health"

The content of the training courses and the procedure to register will be described.

More information is available on the EURL website

www.eurl-fish.eu

Results of the proficiency test, PT1 and PT2, 2025

Teena Vendel Klinge, Niccoló Vendramin, Argelia Cuenca

EU Reference Laboratory for Fish and Crustacean Diseases,

DTU AQUA National Institute of Aquatic Resources, Kemitorvet, Bygning 202, 2800 Kgs. Lyngby,

Copenhagen, niven@aqua.dtu.dk

Abstract

A comparative test of diagnostic procedures was provided by the European Union Reference Laboratory (EURL) for Fish Diseases. The test was divided into proficiency test 1 (PT1) and proficiency test 2 (PT2).
PT1 was designed to primarily assess the identification of the fish viruses causing the notifiable diseases: viral haemorrhagic septicaemia virus (VHSV), infectious hematopoietic necrosis virus (IHNV), and epizootic haematopoietic necrosis virus (EHNV) or related rana-viruses and in addition the fish pathogenic viruses: other fish rhabdoviruses as pike fry rhabdovirus (PFR),spring viraemia of carp virus (SVCV) and infectious pancreatic necrosis virus (IPNV) by cell culture based methods.
PT2 was designed for assessing the ability of participating laboratories to identify the fish pathogens: infectious salmon anaemia virus (ISAV), salmon alphavirus (SAV) and cyprinid herpesvirus 3 (CyHV-3) (otherwise known as koi herpes virus – KHV) by biomolecular methods (PCR based). As in previous years, Salmonid Alphavirus (SAV) was included in the panel of pathogens to be investigated should include. Since SAV is not a listed disease in the European legislation, testing for SAV was done on voluntarily base. The EURL would then take care of calculating the score accordingly.
Both PT1 and PT2 are accredited by DANAK under registration number 515 for proficiency testing according to the quality assurance standard DS/EN ISO/IEC 17043. This report covers both the results of PT1 and PT2. Participants were asked to identify the content of each ampoule by the methods used in their laboratory which should be according to the procedures described in EURL diagnostic manuals available on the website

Participants were asked to download an excel sheet from the EURL web site (http://www.eurl-fish.eu/) to be used for reporting results and to be submitted to the EURL electronically. Additionally, participants were requested to answer a questionnaire regarding the accreditation status of their laboratory.
The tests were sent from the EURL in September 2025.
The test was divided into proficiency test 1 (PT1) and proficiency test 2 (PT2).
46 laboratories participated in PT1 while 44 participated in PT2.
Each laboratory was given a code number to ensure discretion. The code number of each participant is supplied to the respective laboratories with this report. Furthermore, the providers of the proficiency test have included comments to the participants if relevant. An uncoded version of the report is sent to the European Commission.

Résumé and concluding remarks PT1

100% of the packages reached the destination country eight days after dispatch. One participant received the package after 22 days due to internal delays and one country never received the parcels due to customs issues.

Overall, 43 out of 46 participants scored 100% success rate. Out of the 3 laboratories which underperformed one participant scored <100% for the sole reason that they did not back up their concluding results of ampoule I (EHNV) with sequencing. One laboratory incorrectly answered NOT EHNV in 'Concluding Result' on ampoule I. Two laboratories did not identify the virus included in all ampoules.

Suggestions to improve underperformance will be provided individually to each laboratory.

Résumé and concluding remarks PT2

44 laboratories participated in PT2, 41 obtained 100% success rate.

- All 44 laboratories correctly identified the CyHV-3 (KHV) in ampoule VI.
- All 44 laboratories correctly identified the ISA virus in ampoule VII. One laboratory did not sequence the isolate, two laboratories gave the incorrect HPR-type due to wrong interpretation of correct sequence. Finally, eleven laboratories answered ISAV in 'Concluding Result' but correctly identified the isolates as HPR-deleted in the sequencing sheet.
- 38 laboratories tested for SAV and all 38 correctly identified the virus in Ampoule VIII, 6 laboratories did not test for SAV.

Underperformances related to sequence analysis of HPR of ISAV will be addressed directly with the participants that have underperformed.

The EURL provides the annual proficiency test, collates the data and process the figures so that individual laboratories can see how they fare in relation to the other participants. It is up to the individual laboratory to assess if they perform according to their own expectations and standards. We take the opportunity to provide comments to participants regarding submitted results if relevant. Furthermore, we encourage all participants to contact us with any questions concerning the test or any other diagnostic matters.

EURL for Fish Diseases, work done in 2025

Niccolò Vendramin

DTU Aqua

niven@aqua.dtu.dk

Abstract

The duties of the EURL are described in the REGULATION (EU) 2017/625 (OCR). The duties mainly concern the fish cat A, C and E diseases given in (EU) 2018/1882 : Epizootic haematopoietic necrosis (EHN), Infectious salmon anaemia (ISA), viral haemorrhagic septicaemia (VHS), infectious hematopoietic necrosis (IHN), and koi herpes virus disease (KHVD).

The facilities supporting the activities of the EURL are placed in the DTU Campus in Kgs. Lyngby, and placed in the institute DTU AQUA, National Institute of Aquatic Resources.

The 29th Annual Workshop of the National Reference Laboratories for Fish Diseases was held in person, on 26th and 27th of May 2025.

The annual proficiency test for fish diseases (PT) was divided into PT1 and PT2 with 46 laboratories participating. The tests were sent from the EURL October 2025. The full report with the results and the identification of NRL has been submitted to the Commission, whereas each participant has received: 1- Coded version the report, 2- Certificate of performances indicating also the laboratory code, and if underperformances were observed, a comment explaining potential reasons for this and 3- An email with comments on sequencing and genotyping results.

An important focus of the EURL is to update the standard operating procedures of the non-exotic and exotic listed diseases. In 2025 and the EURL has focused on reviewing of the diagnostic manual of fish diseases. Furthermore, the EURL did focus on reviewing list of susceptible and vector species for the listed fish diseases.

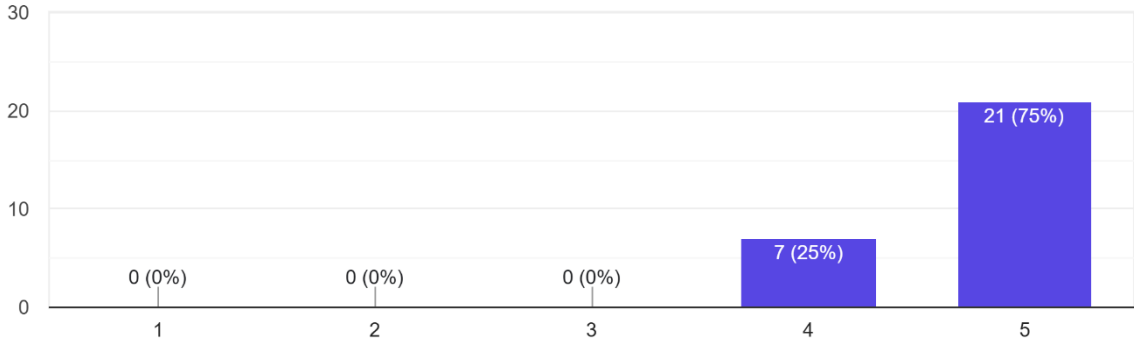
During 2025, resources were again used to collate data on surveillance, health categorisation and diagnostics in EU; to identify and characterise selected virus isolates; to type, store and update a library of listed virus isolates; to supply reference materials to NRLs; to provide training courses in laboratory diagnosis; to update the EURL website (www.eurl-fish.eu), to provide consultancy to NRL´s and finally to attend international meetings and conferences.

Workshop evaluation

A questionnaire was delivered to the participants asking to evaluate various aspects of the workshop. An overview of the 28 questionnaires retrieved is shown below.

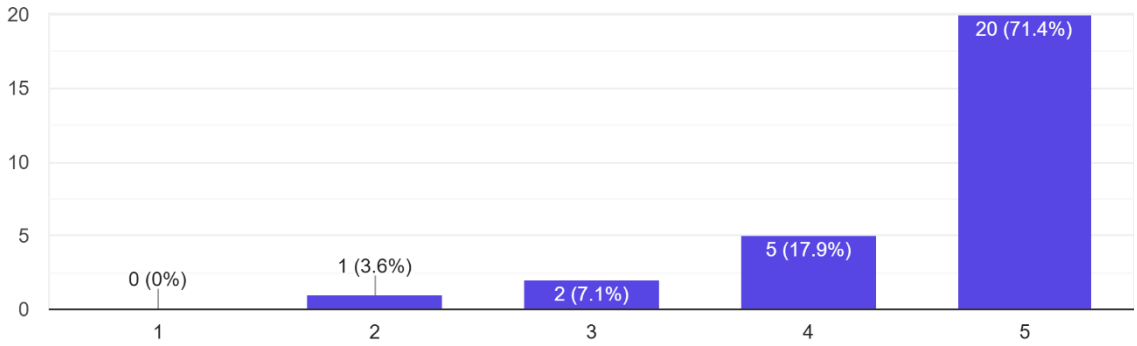
Session I: Update on important fish diseases and their control - Quality of presentations

28 responses



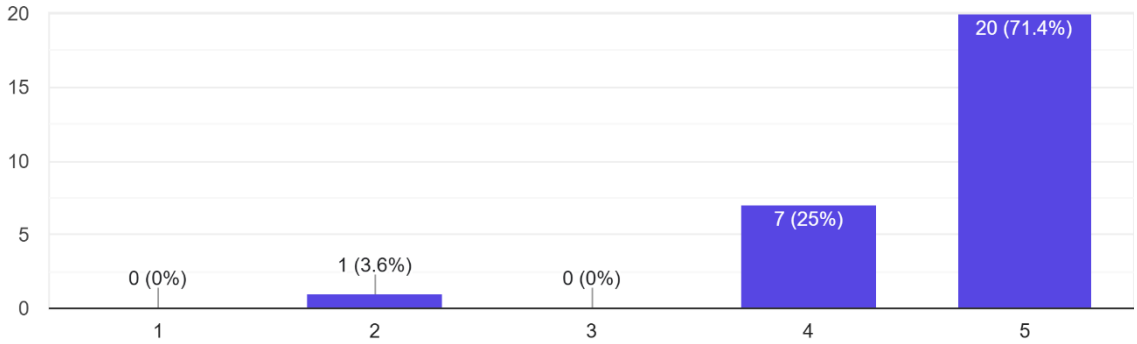
Session I: Update on important fish diseases and their control - relevance for you

28 responses



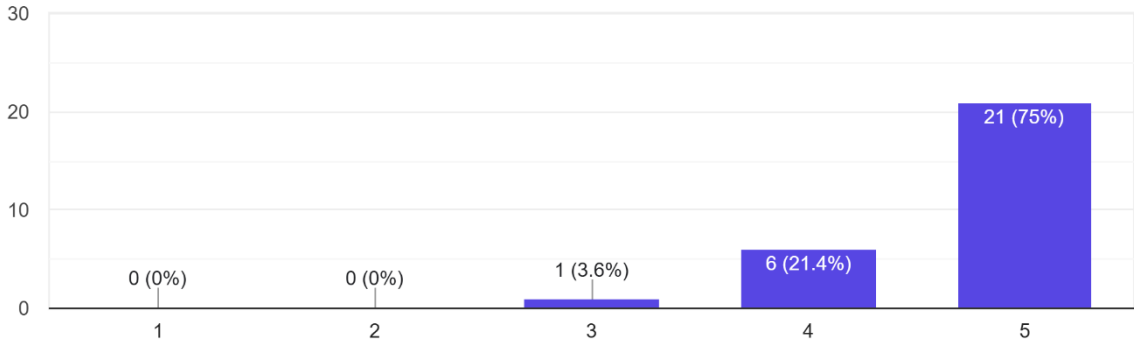
Session I: Update on important fish diseases and their control - increase of your knowledge

28 responses



Session I: Update on important fish diseases and their control - overall score

28 responses



Session I: Update on important fish diseases and their control - comments, remarks, inputs, responses

With the relevance my problem is that the topics are mostly the arctic and salmonid fishes, which are not or barely breed in our country, in Central Europe we have mainly Cyprinids and catfishes, more discussion about the disease about those species would be more useful for me. But it is not the fault of the presenters, I know that they come from countries where different species are breed like here.

no comments

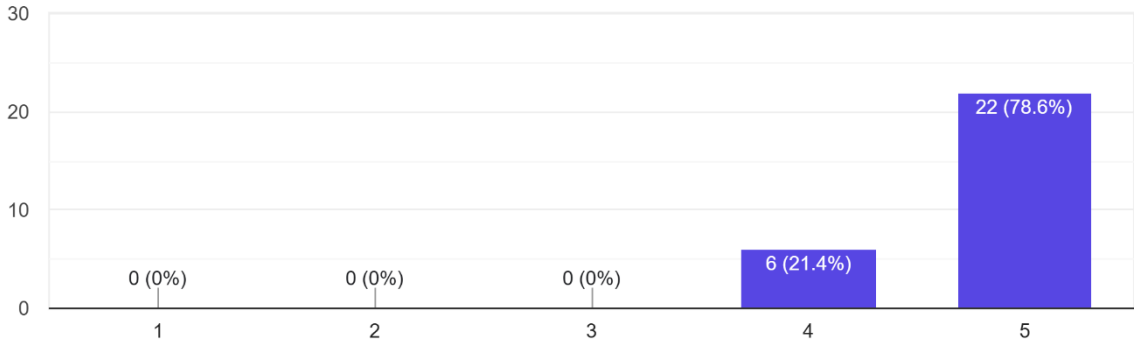
The session provided a comprehensive overview of important fish diseases and current control strategies. The presentations were clear, informative, and highly relevant to routine diagnostic and surveillance activities.

general comment: Since the invitation arrives only to the head of the lab I don't know if i can share the link whit my colleagues or if there is a limited n° of place available. next time please explicit a max numebr of attending person allowed per reference lab to attend.

It was a great and complete review of the fish diseases situation in Europe

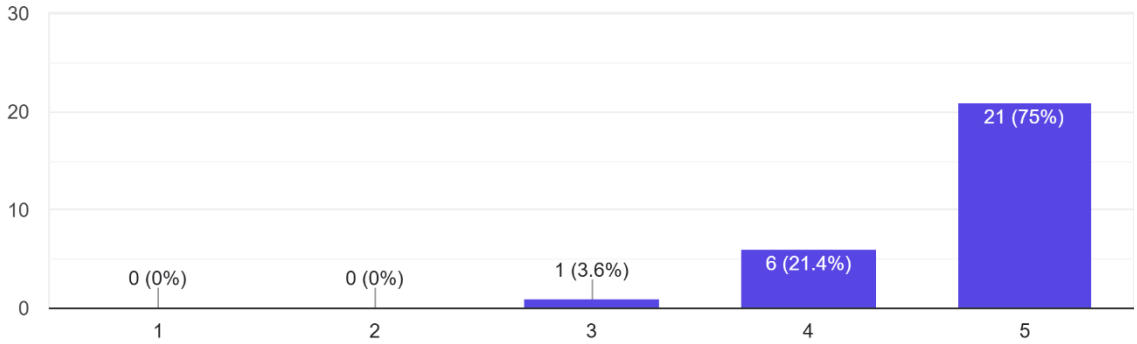
SESSION II: Control and Surveillance of fish diseases in Europe- Quality of the presentations

28 responses



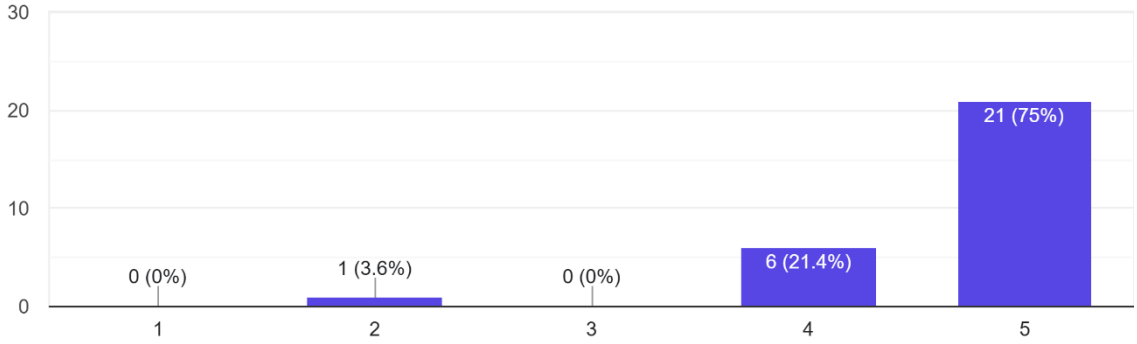
SESSION II: Control and Surveillance of fish diseases in Europe- relevance for you

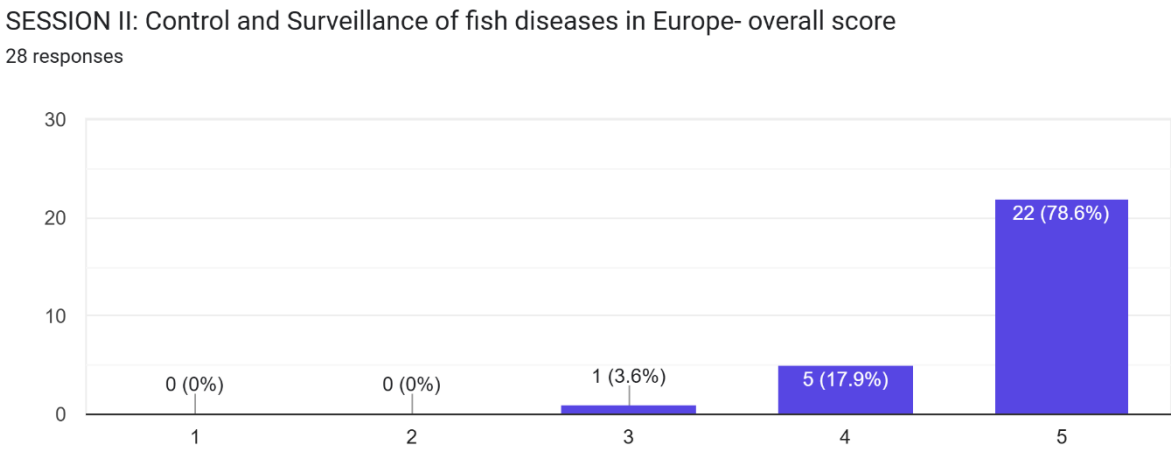
28 responses



SESSION II: Control and Surveillance of fish diseases in Europe- increase of your knowledge

28 responses



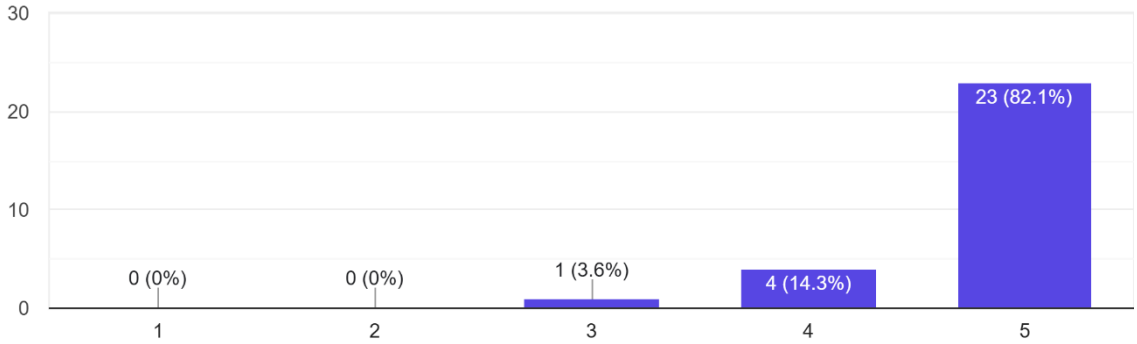


SESSION II: Control and Surveillance of fish diseases in Europe- comments, remarks inputs1 response

No comments

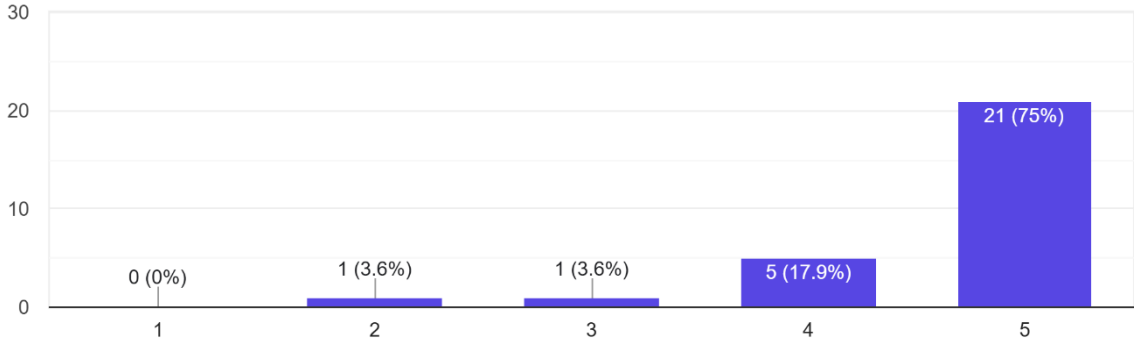
SESSION III: Results from ongoing research on listed and emerging fish diseases-quality of the presentations

28 responses



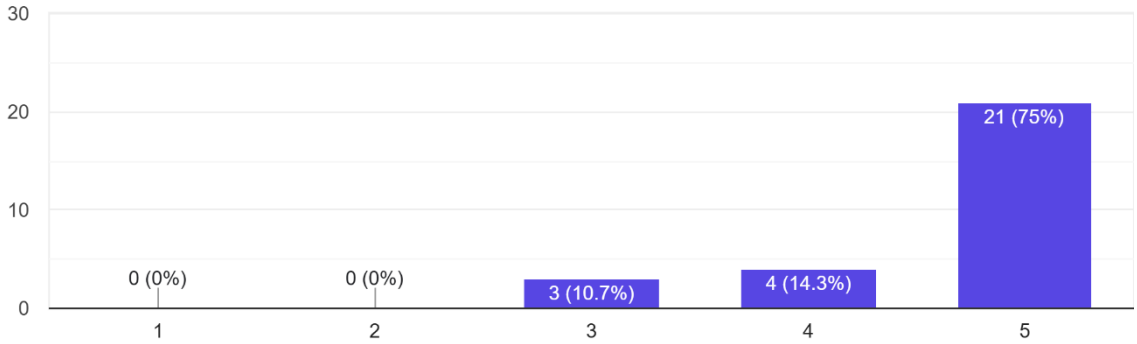
SESSION III: Results from ongoing research on listed and emerging fish diseases-increase of your knowledge

28 responses



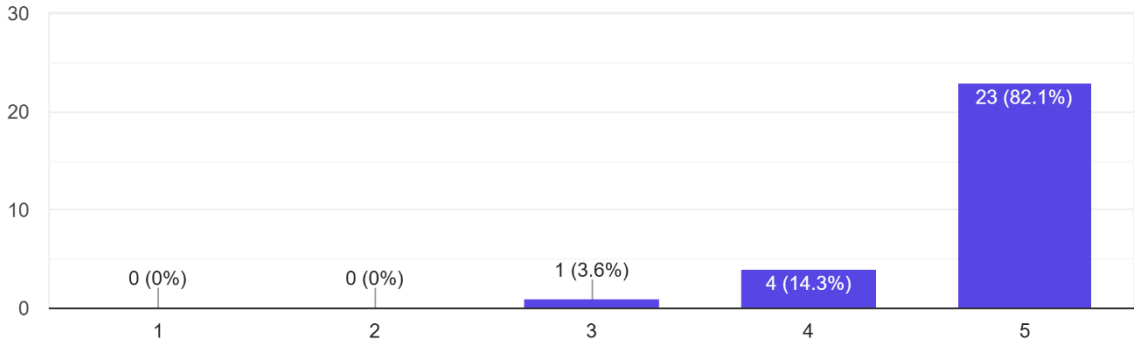
SESSION III: Results from ongoing research on listed and emerging fish diseases-relevance for you

28 responses



SESSION III: Results from ongoing research on listed and emerging fish diseases-overall score

28 responses

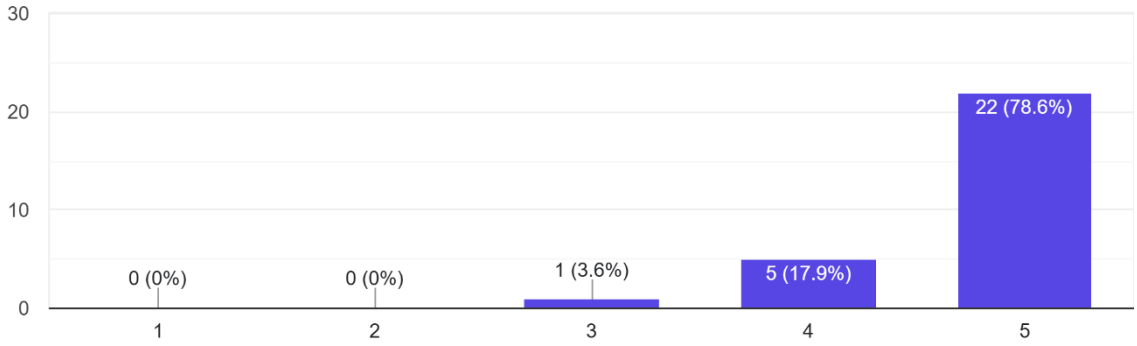


SESSION III: Results from ongoing research on listed and emerging fish diseases- comments, inputs, remarks, responses

No responses yet for this question.

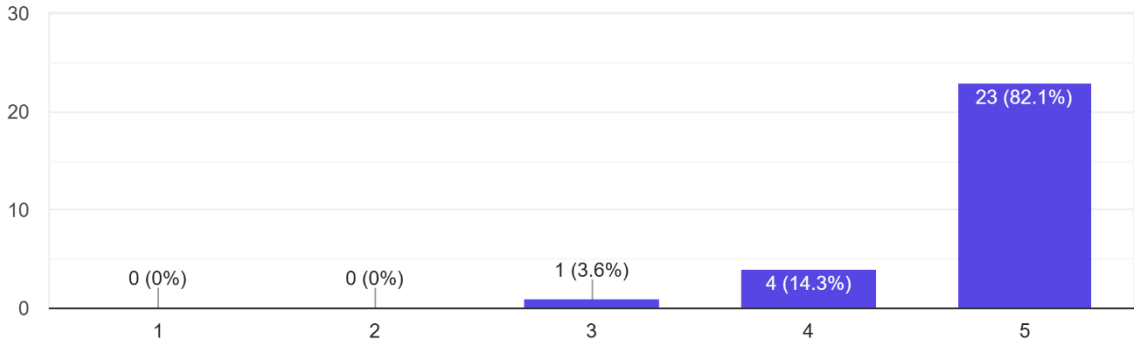
SESSION IV: Update from the EURL for fish diseases- quality of the presentations

28 responses



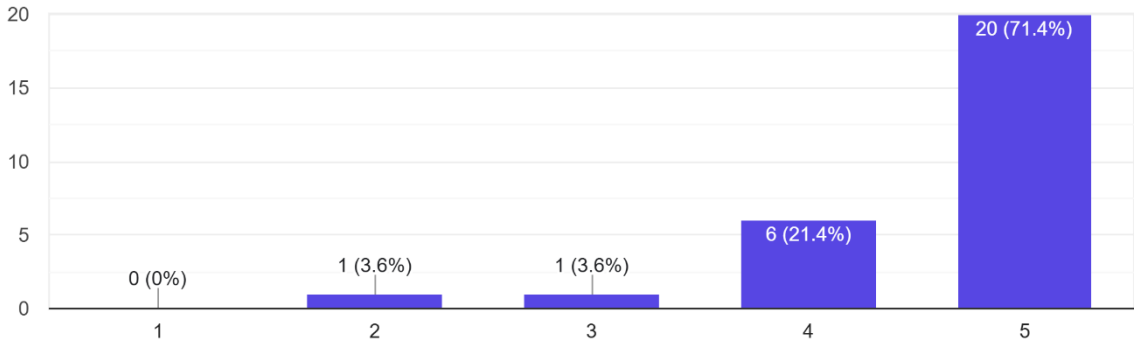
SESSION IV: Update from the EURL for fish diseases- relevance for you

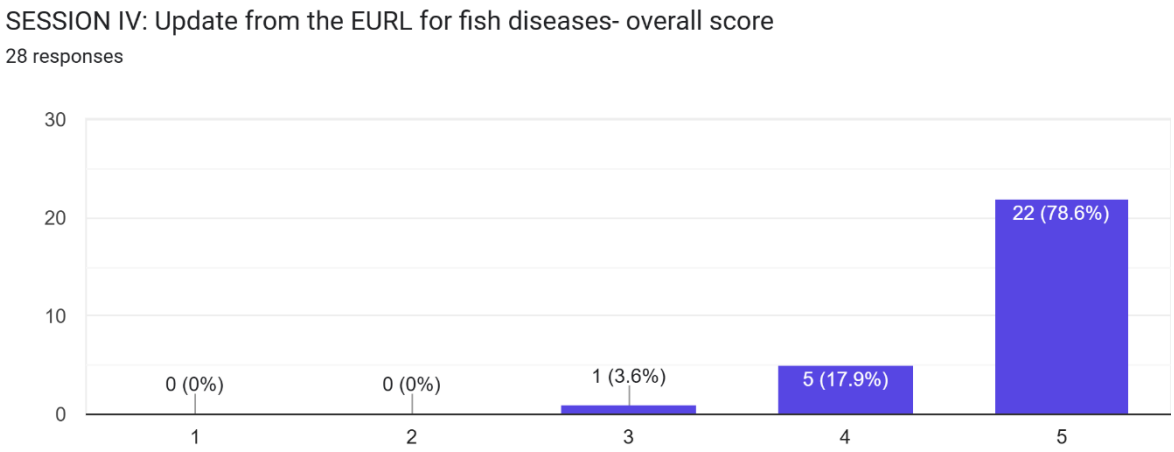
28 responses



SESSION IV: Update from the EURL for fish diseases- increase of your knowledge

28 responses





SESSION IV: Update from the EURL for fish diseases- comments, inputs, remarks, response

Thanks a lot for your very valuable work as coordinator at european level and even more!

Greetings and conclusions of the meeting

The tentative dates for the next meeting will be in the end of May 2027. It will be organized as an on-site physical meeting in Lyngby, Denmark. Based on the results from the questionnaire, we are extremely satisfied of the output of the Workshop. Thanks a lot, to the people arranging the meeting as well as those of you who helped running the meeting by being chair, presenter and/or participant.

We are looking forward to seeing you all next year!

With kind regards,

The EURL fish and crustacean team.