



European Union Reference Laboratory for Fish and Crustacean Diseases

NATIONAL INSTITUTE OF AQUATIC RESOURCES, TECHNICAL UNIVERSITY OF DENMARK

EURL Training Course on Methods for implementation of surveillance procedures for listed fish diseases

Copenhagen, October 5th - 9th 2020

Hosted by the European Union Reference Laboratory for Fish and
Crustacean Diseases

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General introduction

The training course on “Methods for implementation of surveillance procedures for listed fish diseases” was organized by the EURL for Fish and Crustacean Diseases located in Kgs. Lyngby at DTU Aqua, Denmark, from October the 5th to the 9th, 2020. This year due to the Covid-19 pandemic and related travel restrictions it was only possible to organize one virtual course based on the Zoom platform. The course took place from 5th to 9th October and hosted 23 participants. Thanks to the organization on a virtual platform we could allow the participation of almost the double number of participants compared to when the course is organized physically, moreover this have open opportunities for attendance from oversea countries such as Ghana and USA.

The overall purpose of the training courses was to provide an opportunity for the NRLs to train in techniques relevant when working with listed fish diseases. In addition to teachers from the EURL team at DTU Aqua a colleague from the Danish Veterinary and Food Administration (DVFA) contributed to the course. Knowledge-sharing and discussions between participants and teachers were important parts of the course.

Methods for implementation of surveillance procedures for listed fish diseases

The five-day course in “Methods for implementation of surveillance procedures for listed fish diseases” was divided in 5 sessions. The majority of the teaching was based on presentations and discussion with the participants, for specific session it was possible to practically demonstrate the procedures and finally working group activities were conducted using the breakout rooms function of zoom.

Day 1 was dedicated to legislation and implementation of surveillance plans.

After a welcome and introduction to the course in its new virtual version, all participants were asked to give a short presentation of themselves. Afterwards prof. Niels Jørgen Olesen gave a presentation of the legislative framework for surveillance and control of listed fish diseases. During the presentation participants were asked to answer some answers using polls function of zoom.

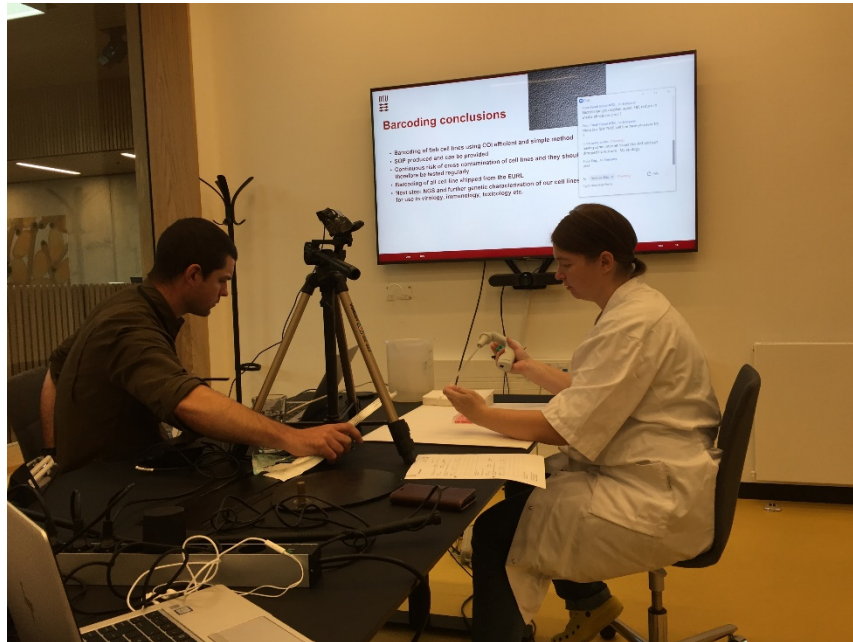
Later on, Morten Fruergaard-Andreasen from DVFA gave a talk about Danish aquaculture and disease surveillance after which Niels Jørgen Olesen gave a presentation on the control and eradication of VHS from Denmark.

Day 2 was allocated to sampling procedures for surveying listed fish diseases. In the first part of the session a lecture was given by Niccoló Vendramin (EURL coordinator for fish diseases) on criteria and requirements on how to conduct surveillance for listed fish diseases. This part of the session aimed at being interactive engaging all participants in active discussions to share questions and experiences. After a break, a practical demonstration of fish anatomy was given combining two different webcams to show the sampling procedures from different angles. Later on the laboratory procedures to process fish tissues for virological examinations on cell culture was demonstrated. This second part of the course was led by senior advisor Tine Moesgaard Iburg.

Day 3 This day was allocated to present and discuss the use of classical virological examinations on cell cultures.

Initially a demonstration of the inoculation of samples processed for virological examination on day 2 was given. Later on a presentation on the use of fish cell lines was given, again aiming at engaging all the participants in actual discussion on the topic.

After a break, a practical demonstration of various cytopathic effect on different cell culture lines was presented. A set of 7 fish viruses including VHSV; IHNV; IPNV; EHNV; ISAV; Nodavirus was prepared on different cell culture lines. By coupling the microscope camera on zoom platform and sharing screen it was possible for all participants to visualise the effect of different viruses directly on the monitor of their PC.



Lab. technician Betina Lynnerup demonstrating inoculation of cell culture with diagnostic sample (mock sample)

Day 4 was tutored by senior scientist Argelia Cuenca and fully dedicated to qPCR methods and molecular methods for surveying listed fish diseases. A lecture was given by Argelia, including both general concepts of molecular biology and specific information on the diseases targeted in the surveillance and the methods that shall be applied. A final session explained how BLAST works and how to interpret BLAST results, including practical examples and discussions.

Day 5 the participants were divided into four groups. Each group was located in a separate breakout room and was given a task. The task included a scenario specific for each of the listed diseases, group members were given access to relevant material such as the diagnostic manuals of EU and OIE. Each group had to appoint a rapporteur and a chair to steer the discussion, and answer all the questions included in the task.

This first part of the exercise lasted approx. 1 hour. After a short break, all the groups were divided into new ones, in a way that each of these new group included a representative for each disease.

The assignment for this second session was to present the findings to all the other members of the group and engage in discussions.

This second session lasted approx. 40 minutes.

In both sessions Niels Jørgen Olesen and Niccoló Vendramin assisted the break out rooms if there were queries etc.

Finally all the participants were gathered in a general assembly and the different questions were discussed and answered to ensure a homogeneous transfer of knowledge to all participants.

Participants were then asked to fill a google form for evaluating the course and provide inputs for improvement.

The methods taught were primarily focused on the protocols given in the EU legislation and on the guidelines from the OIE Manual of Aquatic Animal Diseases, and included how to select proper controls, the typical pitfalls, troubleshooting, etc.

Participant list

Training course 2020 : Methods for implementation of surveillance procedures for listed diseases				
Name	Surname	Email	Country	Institution
Mona	Saleh	mona.saleh@vetmeduni.ac.at	Austria	Clinical Division of Fish Medicine, Dept. for Farm Animals and Vet. Public Health, University of Veterinary Medicine
Toni	Eterovic	toni.eterovic@vfs.unsa.ba	Bosnia and Herzegovina	National reference laboratory for fish diseases, Veterinary faculty in Sarajevo
Ekaterina	Mileva	katrin_r@abv.bg	Bulgaria	NDRVI Bulgaria
Katerina	Mikulaskova	mikulaskova@svujihlava.cz	Czech Republic	Department of Virology - State Veterinary Institute Jihlava
David	Opavský	opavsky@svujihlava.cz	Czech Republic	Department of Virology - State Veterinary Institute Jihlava
Željko	Pavlinec	pavlinec@veinst.hr	Croatia	Croatian Veterinary Institute
Vasiliki	Christodoulou	vchristodoulou@vs.moa.gov.cy	Cyprus	Veterinary Services, State Veterinary Laboratories, Laboratory for Animal Health, Virology Section
Marjukka	Rask	marjukka.rask@ruokavirasto.fi	Finland	Finnish Food Authority
Daniel	Adjei-Boateng	adjeibd@gmail.com daboateng.fnr@knust.edu.gh	Ghana	Kwame Nkrumah University of Science and Technology, Kumasi, Ghana
Regina	Edziyie	edziyie@yahoo.co.uk reedziyie.fnr@knust.edu.gh	Ghana	Kwame Nkrumah University of Science and Technology, Kumasi, Ghana
Sigrídur	Hjartardóttir	sigrhj@hi.is	Iceland	Institute for Experimental Pathology - Keldur Iceland
Gintare	Bagdonaite	gintare.bagdonaite@afbini.gov.uk	Northern Ireland	Agri Food and Biosciences Institute Belfast
Rasika	Wathsala	rasika.rajapaksha2@unibo.it	Italy	University of Bologna
Aleksandar	Trajčovski	aleksandar.trajcovski@gmail.com	Macedonia	Faculty of Veterinary Medicine Skopje - North Macedonia
Britt	Gjerset	britt.gjerset@vetinst.no	Norway	Norwegian Veterinary Institute
Jonathan	Oladjins	jonathan.oladjins@gov.scot	Scotland	Marine Scotland Science – Disease Diagnostic Group
Dimitrije	Glisic	glisicdimitrije@gmail.com	Serbia	NRL for Fish diseases Serbia, Institute of Veterinary Medicine of Serbia
Edgar Bertomeu	Primo	edgar.bertomeu@irta.cat	Spain	IRTA Aquatic Health Team
Meret	Jufer	meret.jufer@vetsuisse.unibe.ch	Suisse	FIWI (Zentrum für Fish- und Wildtiermedizin - University of Bern)
Ludvig	Orsén	ludvig.orsen@sva.se	Sweden	Swedish National Veterinary Institute
Farah G.	Aydin	fgaydin@ankara.edu.tr farahgonul.aydin@gmail.com	Turkey	Ankara University - Faculty of Veterinary Medicine/Dept. Pharmacology and Toxicology
Yuriy	Rud	rudziknew@ukr.net	Ukraine	Institute of Fisheries of NAAS of Ukraine
Janet	Warg	janet.w.warg@usda.gov	USA	National Veterinary Services Laboratories (NVSL)



Course Announcement: Methods for implementation of surveillance procedures for listed fish diseases

Dear colleagues,

Lyngby 24.07.2020

As announced Tuesday June 30th, the travelling uncertainties related to the Covid-19 pandemic have led us to cancel the EURL training courses in week 41 and 42 with the original set up which relies on physical participation in Denmark.

In order to mitigate the impact of such decision we have agreed for this year to replace the courses with **one online** training course on “Methods for implementation of surveillance procedures for listed fish diseases” in week 41 (from Monday October 5th to Friday October 9th 2020)

Programme

The course will consist of five sessions, which will take place in the afternoon from 13.00 to approximately 16.00 CET. Each session will include lectures, as well as quiz, tasks and work in small groups organized in separate online rooms.

The topics of the 5 sessions will cover the topics normally included in the program for the training course in week 41:

- 1- Listed fish disease in Europe: Legislation and implementation of surveillance plans.
- 2- Sampling procedures for surveying listed fish diseases
- 3- The use of cell culture for surveying listed fish diseases
- 4- qPCR methods, sequencing and bioinformatics for surveying listed fish diseases
- 5- Wrap up session, evaluation of the course and general recommendations

By attending the entire course, participants will receive a course certificate.

Teaching platform and course material

The course will be organized by [zoom](#) platform.

Personal invitation to the training course will be send to participants via Outlook calendar, the link should not be shared with others; it is unique to each participant.

A compendium covering the topic of the course will be made available to the participants prior to the course start.

Course fee

The course is for free for NRL representatives in EU member states as well for members of governmental institutions, such as universities and veterinary institutes.

Employees of private companies are welcome to attend the course as well, for them a participating fee of 200 euros is requested.

Please note for all participants, there is cancellation fee of 100 euros if a participation is cancelled less than a week before the course begins.

Registration

Please use the registration form attached to this email.

The registration form has to be followed by a letter of motivation, where your background and working experience are briefly described.

The use of online platform allow us to expand the number of participants to the course to 20.

To properly plan and organize the course online, you will be asked to apply to participate to the course, by sending an email to Lis Vinther Elmsted lvi@aqu.dtu.dk ; Linda Stuhr Christensen lschr@aqu.dtu.dk. The information obtained will solely be used to evaluate participants according to the foreseen activities.

Deadline for application is **September 1st**.

By September 21st we will communicate to you if the application has been accepted.

We look forward to receive your application, do not hesitate to contact us for further information.

Best regards

The EURL team

Programme: Methods for implementation of surveillance procedures for listed fish diseases

Day 1	Day 2	Day 3	Day 4	Day 5
Section 1 Legislation and implementation of surveillance plans.	Section 2 Sampling procedures for surveying listed fish diseases	Section 3 The use of cell culture for surveying listed fish diseases	Section 4 qPCR methods for surveying listed fish diseases	Section 5 Wrap up session, evaluation of the course and general recommendations
<p>Course introduction Participant presentation</p> <p>Lectures: Aquaculture surveillance and sampling procedures in Denmark. Control of VHS in DK by NJ Olesen</p>	<p>Theoretical introduction to sample preparation, cell cultivation, virus ID and qPCR for surveillance programs for the non-exotic listed fish disease in Europe</p> <p>Demonstration of sampling procedures, discussion on pros and cons of different sampling strategies etc</p>	<p>Opportunities with cell culture and fish diseases</p> <p>Use of cell culture for implementing surveillance programs for listed fish disease</p> <p>Demonstration of cell culture passaging, and viral titration procedures on cell lines</p> <p>Lectures on titration</p> <p>Demonstration of cytopathic effect</p>	<p>PCR and real time PCR theory. PCR and Real Time PCR The diagnostic laboratory – PCR flow.</p> <p>Blast analysis</p>	<p>Group work session. Participants to be divided in group. Each group will receive a task on how to design and conduct surveillance or diagnostic for listed fish disease.</p> <p>Course evaluation</p>

Evaluation: Methods for implementation of surveillance procedures for listed fish diseases

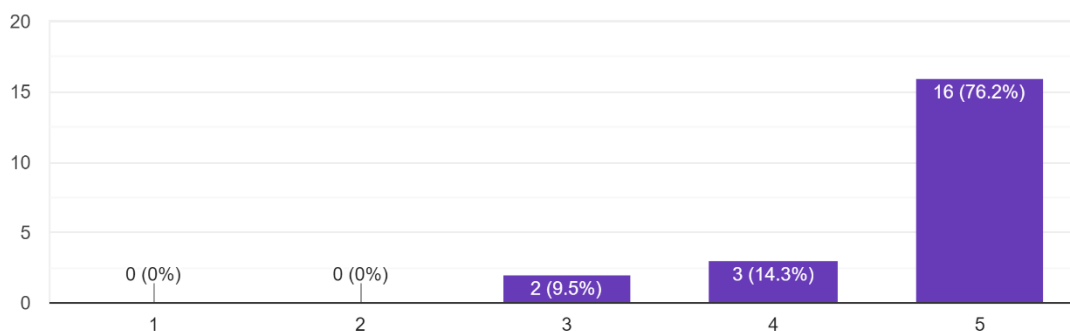
Participant satisfaction level for each respective section was assessed, each aspect of each session was scored on a scale from 1 to 5. Score 1 corresponded to very low, 2 to low, 3 to average, 4 to good, and 5 to excellent. The calculations are based on returned evaluation schemes from 21 participants.

Course evaluation by session

More than 90% of the students scored each of the session as excellent (70% in average) or good (20 % in average).

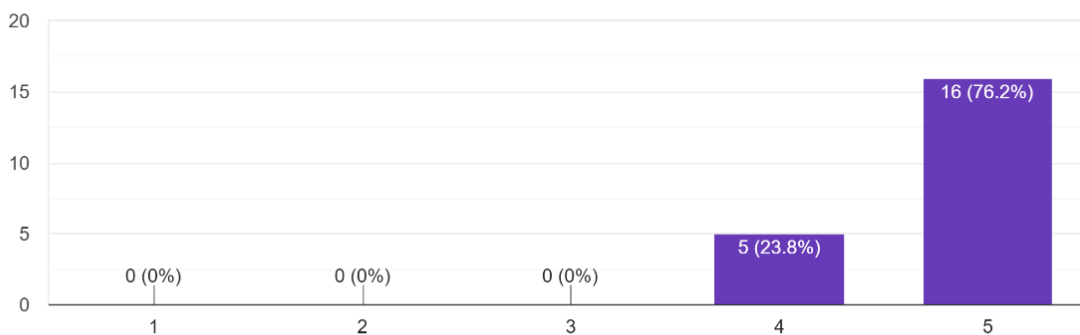
Day 1 introduction to legislative background for listed fish diseases - overall score

21 responses



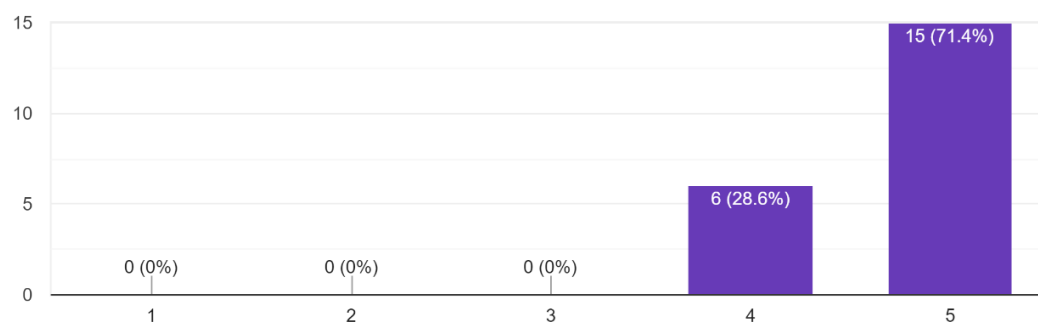
Day 2 general criteria for implementing surveillance of listed fish disease, sampling and sample preparation- overall score

21 responses



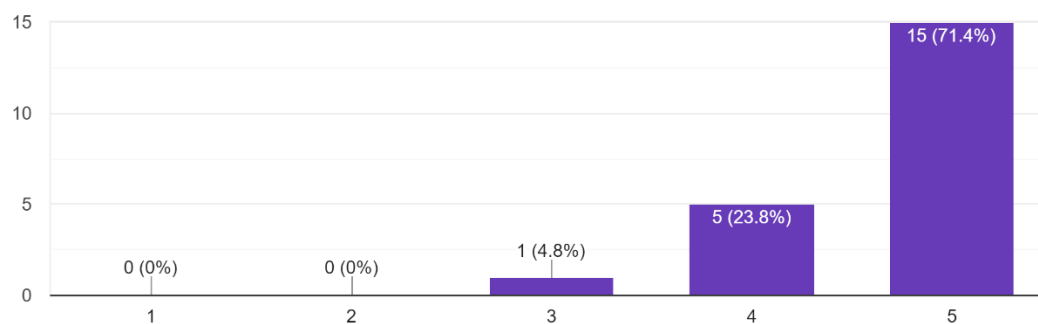
Day 3- use of cell culture for surveillance of listed fish diseases- overall score

21 responses



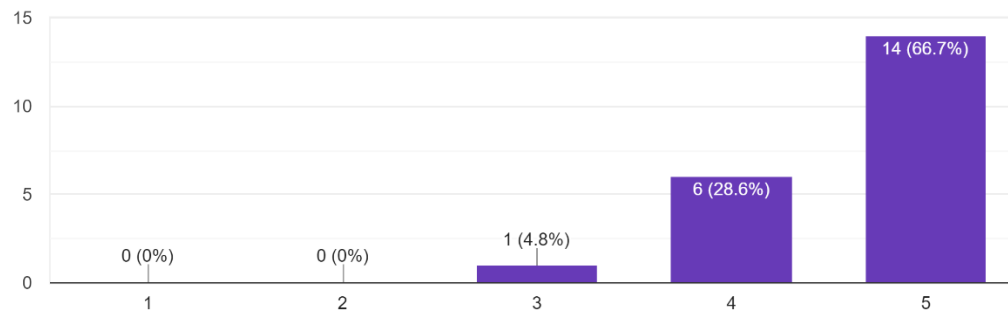
Dat 4 - molecular methods for implementation of surveillance of listed fish diseases- overall score

21 responses



Day 5 - Assignment, discussion and conclusions - overall score

21 responses

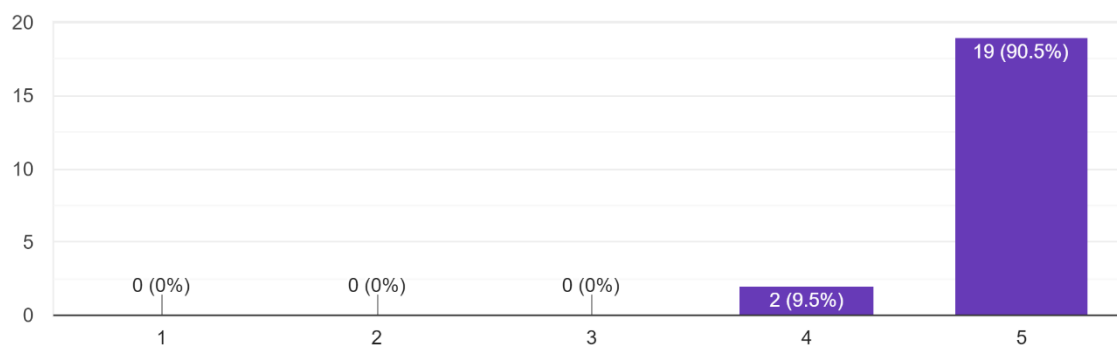


Detailed course evaluation per session

Course evaluation of Day 1

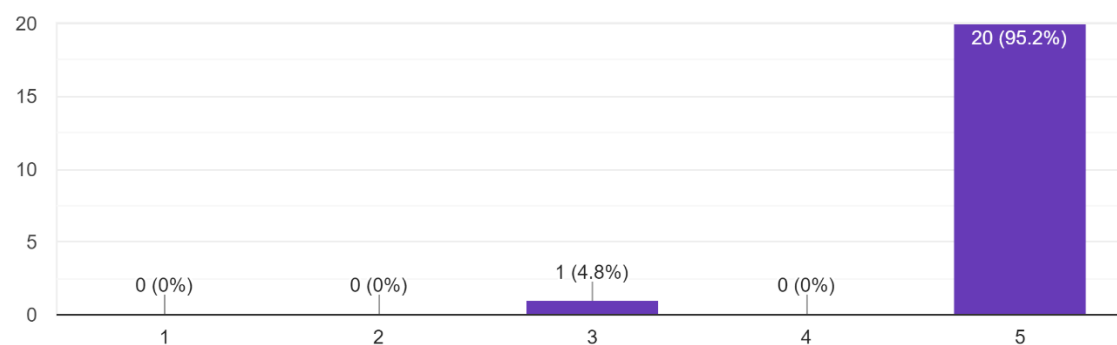
Day 1 introduction to legislative background for listed fish diseases - teacher's expertise

21 responses



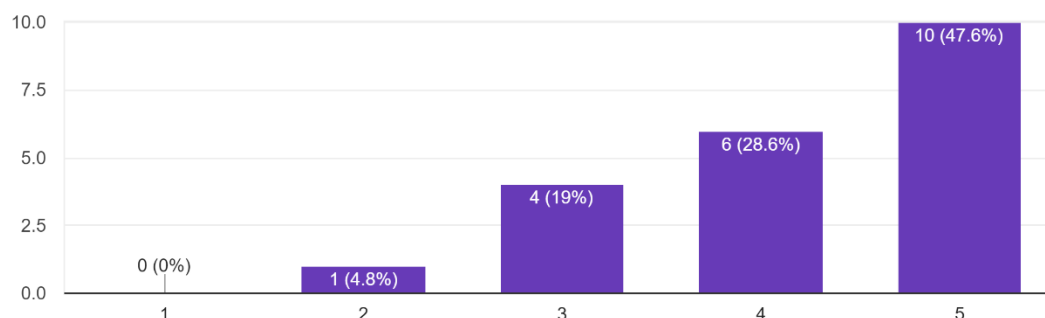
Day 1 introduction to legislative background for listed fish diseases - teacher's preparedness

21 responses



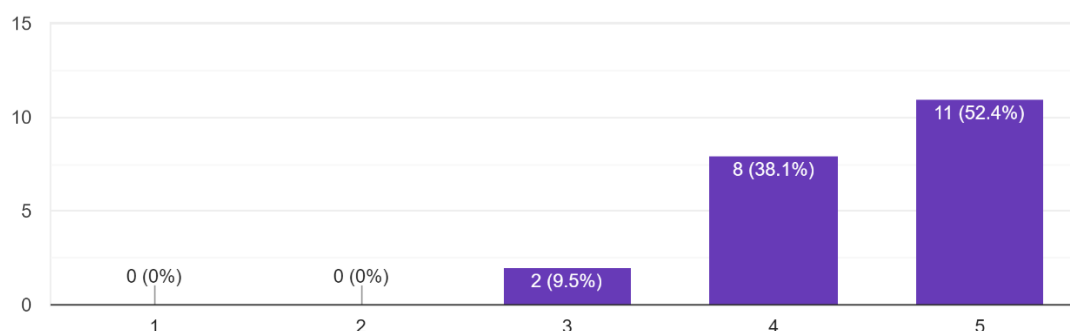
Day 1 introduction to legislative background for listed fish diseases - relevance for you

21 responses



Day 1 introduction to legislative background for listed fish diseases - increase of your knowledge

21 responses



Day 1 introduction to legislative background for listed fish diseases - general comment

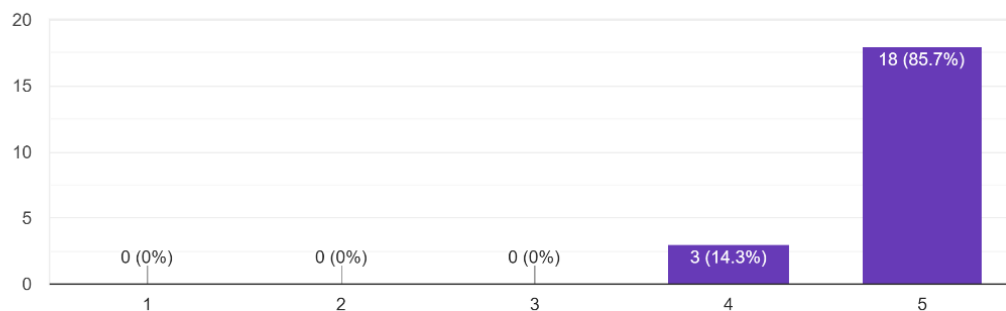
- Good
- very informative, well done
- Very Good
- Too tired day, but very informative training course to me
- a well-organized model for transmitting information
- Good info on changes over time.
- Speaker explained very well to the participants
- good
- /
- Excellently presented by an experienced teacher who reduced the bulky text to the most important.
- I think it was a little bit to long. On one hand, it's very important and has the reason to be well discussed. On the other hand, it is not very relevant for me because I'm not taking such "big" decisions (lab technician).

- It was a bit confusing for me
- Decent
- For me learning about the legislative background was eye-opening as I have not dug down into it before. The overview made it easier to find what matters in our cases that is viral fish diseases.
- it was helpful for me to know the mandatory information diseases
- It's a boring but necessary subject :)
- The instructor had a rich experience in and extensive knowledge of the instruments themselves as well as the reasoning behind them and so was able to make these bulky documents simple enough for us to understand in that short time. Although, we couldn't possibly have finished all of it that short time I now know what to look for and where I am likely to find it. I also liked the pop-up quizzes.
- I appreciated that legislative relevant only to our topic was explained.
- It was very informative and nice to compare older ones
- Very informative it was well organised and all information provided

Course evaluation of Day 2

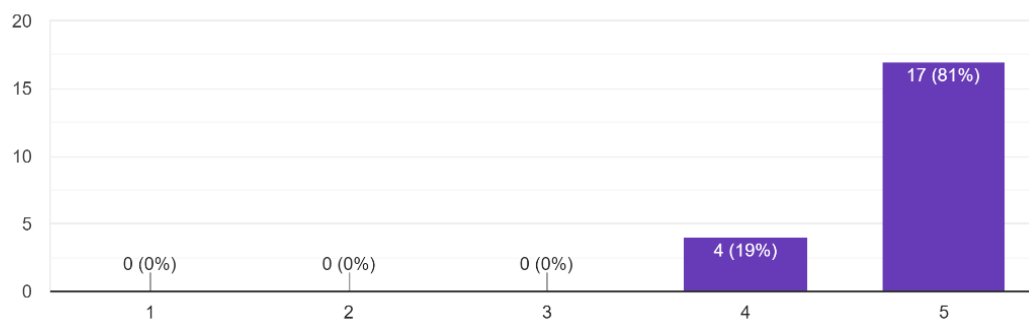
Day 2 general criteria for implementing surveillance of listed fish disease, sampling and sample preparation- teacher's expertise

21 responses



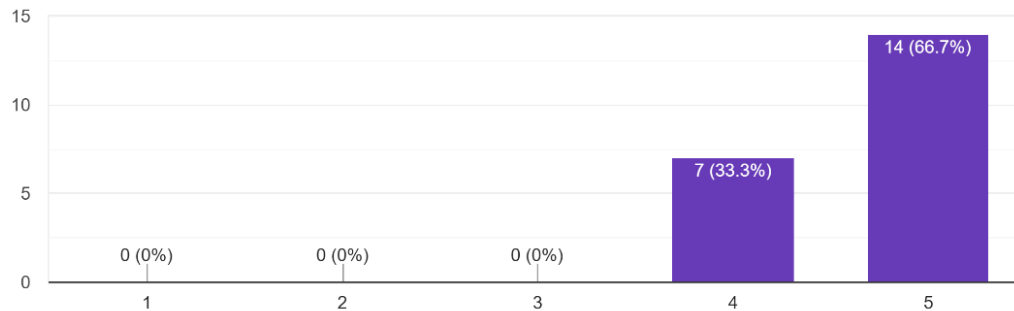
Day 2 general criteria for implementing surveillance of listed fish disease, sampling and sample preparation- teacher's preparedness

21 responses



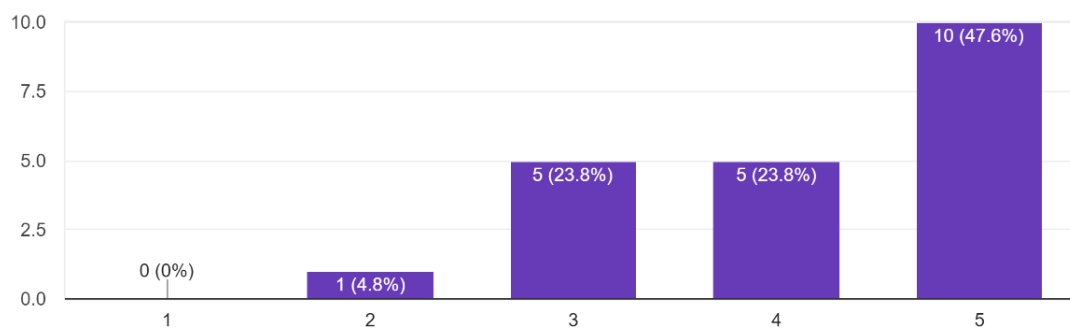
Day 2 general criteria for implementing surveillance of listed fish disease, sampling and sample preparation- relevance for you

21 responses



Day 2 general criteria for implementing surveillance of listed fish disease, sampling and sample preparation- increase of your knowledge

21 responses



Day 2 general criteria for implementing surveillance of listed fish disease, sampling and sample preparation- general comment

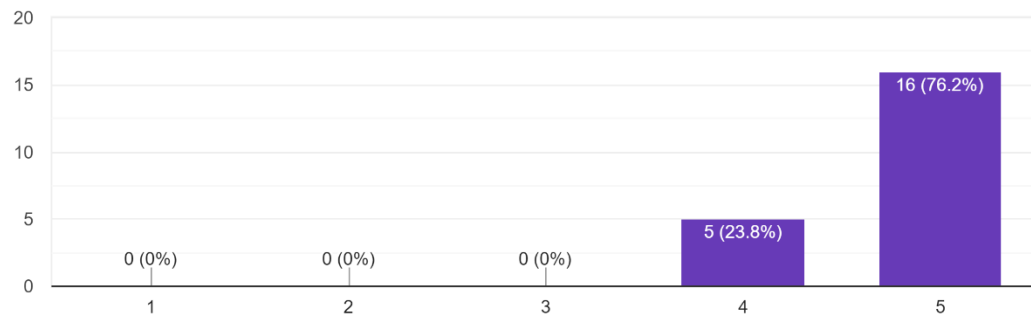
- Good
- Video was good organized, high skilled teachers
- Very Good
- Very informative training course to me
- may be it's needed to consider cameras from two or several angles
- fish size how to handle info in demo very useful
- Very nice explanation
- helpfull
- /

- Day was interesting especially with the slide of the viruses. Could be improved by more breakout sessions for interactions among participants
- It was interesting to hear how it is done somewhere else. If it starts to be practical, it could be nice to do more break-out rooms to share the experience with other participants.
- practical demonstration of sampling was very good
- It was interesting to learn how many things have to be had in mind in order to get the "free of the disease" status. The location of farms and how they are connected etc. The small amount of samples that are taken make me a little bit surprised but I am sure there must have been a lot of background work done in order to justify it.
- widely applied to surveillance in northern countries
- Fine given the circumstances. It's tough to present practical work online.
- The instructor went to extensive lengths to make the experience as well as possible even given the limitations we had; I enjoyed the class. The instructor was talking too fast though, I think if we had 4 hours instead of the three we could have had more time for assimilation. I liked the effort he made to include all of us in the discussion.
- It was contributive especially for me since I do molecular testing of a large number of veterinary diseases but I did not have deep knowledge of any of those.
- It was good
- Considering virtual platform it was very good

Course evaluation of Day 3

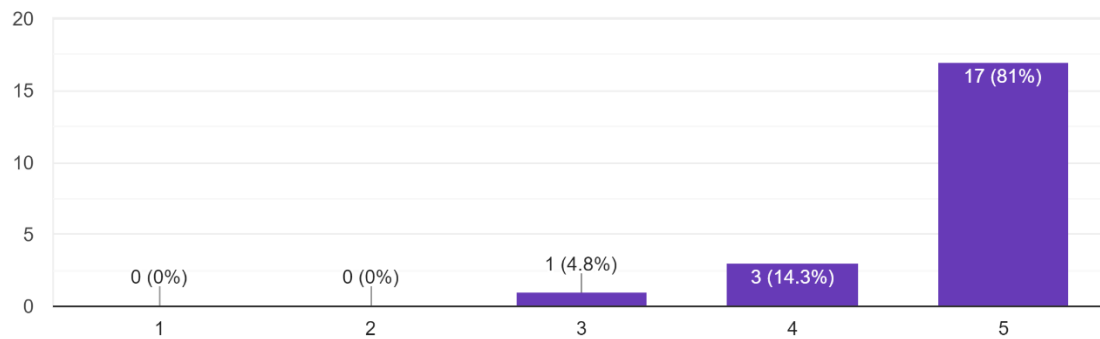
Day 3- use of cell culture for surveillance of listed fish diseases- teacher's expertise

21 responses



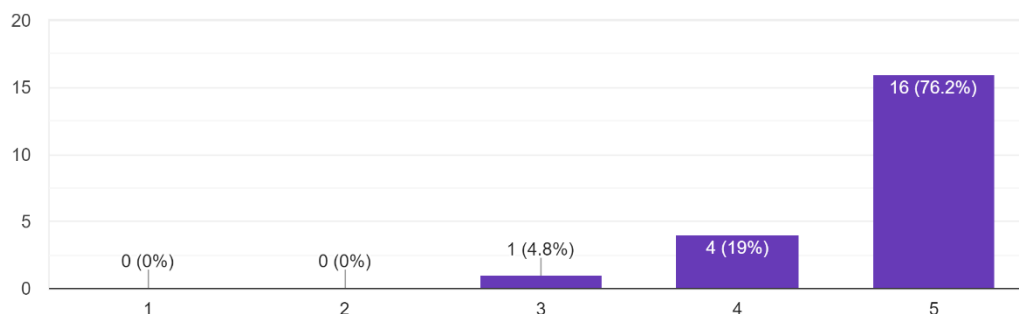
Day 3- use of cell culture for surveillance of listed fish diseases- teacher's preparedness

21 responses



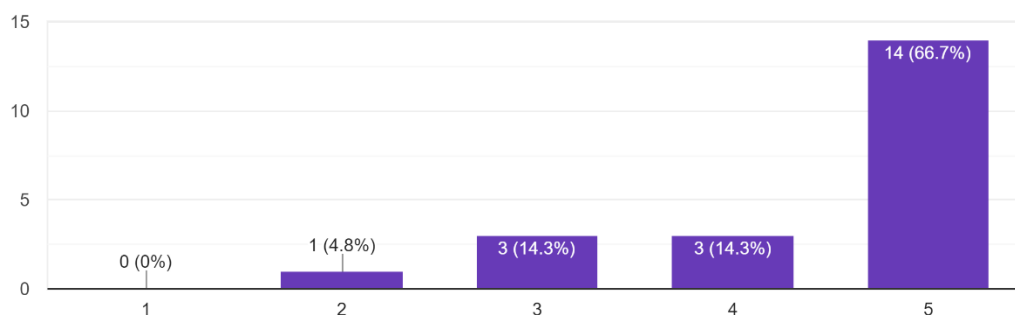
Day 3- use of cell culture for surveillance of listed fish diseases- relevance for you

21 responses



Day 3- use of cell culture for surveillance of listed fish diseases- increase of your knowledge

21 responses



Day 3- use of cell culture for surveillance of listed fish diseases- general comment

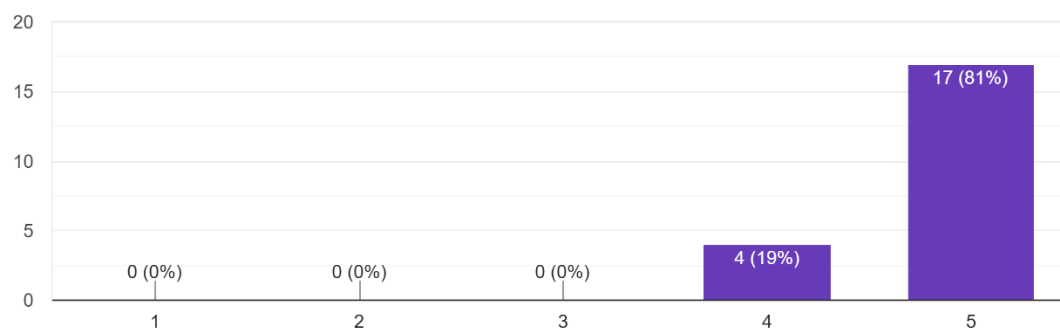
- Good
- lots of examples and practical issues, good view and communication with participants
- Very good.
- Very informative training course to me
- I compared my skills - successfully
- CPE examples very good but time point of infection with photos would be better.
- Explained very well along with practicals
- very usefull
- /
- I have limited knowledge in this area but knowledge was higher after going through the lecture. Could be improved with more time and breakout sessions.
- It was interesting how many types of cell lines for different diseases exist.
- It was fine. Unfortunately we couldn't include more practical activities because of covid

- Great
- I didn't have any experience of cell-culture before so everything was new to me. Giving us good time to describe the difference between cells and how they change after being infected will be stuck in the mind hopefully for some time.
- I guess the main topic was notifiable viruses
- Same as for day 2, hard to present everything online as opposed to in a lab.
- This was great I learnt a lot of things, especially the time the instructor spent on showing us how effects looked liked by looking at the same view with the instructor it made it easier to follow what he was teaching. As the instructor rightly pointed out it would take some time for us to do this easily but this was a great start.
- I do not work with cell cultures so I was a bit lost because of the number of various abbreviations.
- in the future, if there is a comparison between cell lines- related to diseases it will be very nice. Also during the course if there is a pool or working sheet, it'd help too
- Good and informative day, necessary information provided. It was interactive.

Course evaluation of Day 4

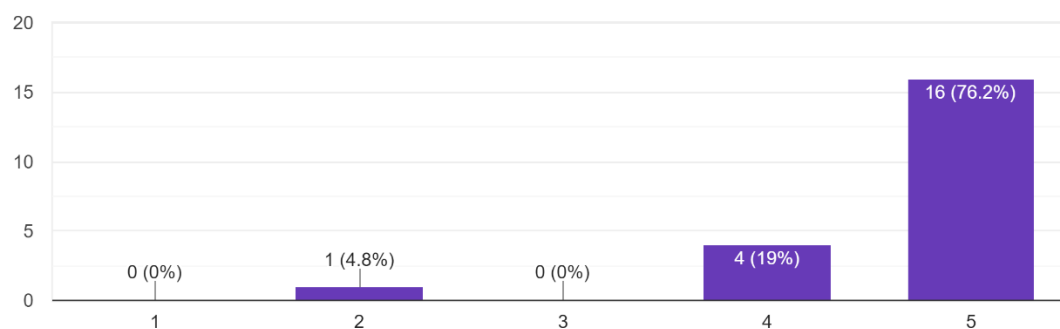
Dat 4 - molecular methods for implementation of surveillance of listed fish diseases- teacher's expertise

21 responses



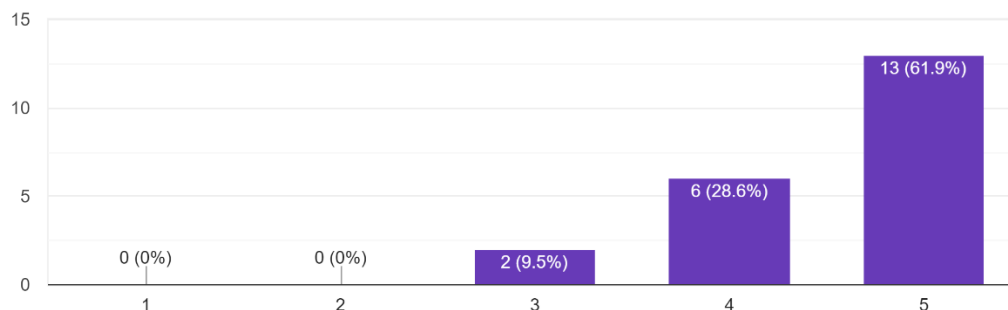
Dat 4 - molecular methods for implementation of surveillance of listed fish diseases- teacher's preparedness

21 responses



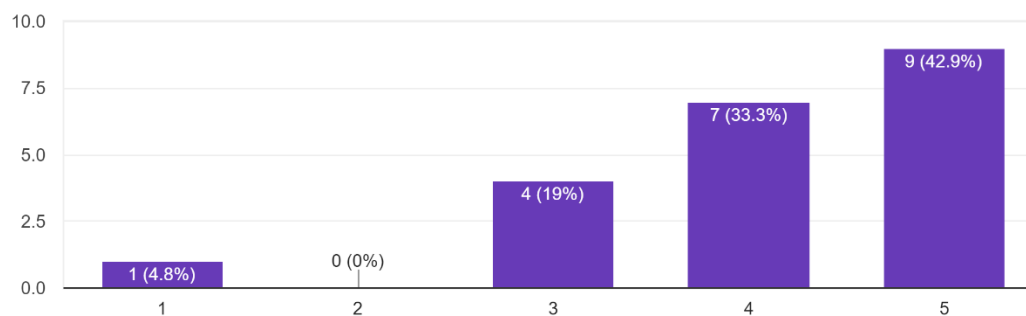
Dat 4 - molecular methods for implementation of surveillance of listed fish diseases- relevance for you

21 responses



Dat 4 - molecular methods for implementation of surveillance of listed fish diseases- increase of your knowledge

21 responses



Day 4 - molecular methods for implementation of surveillance of listed fish diseases- general comment

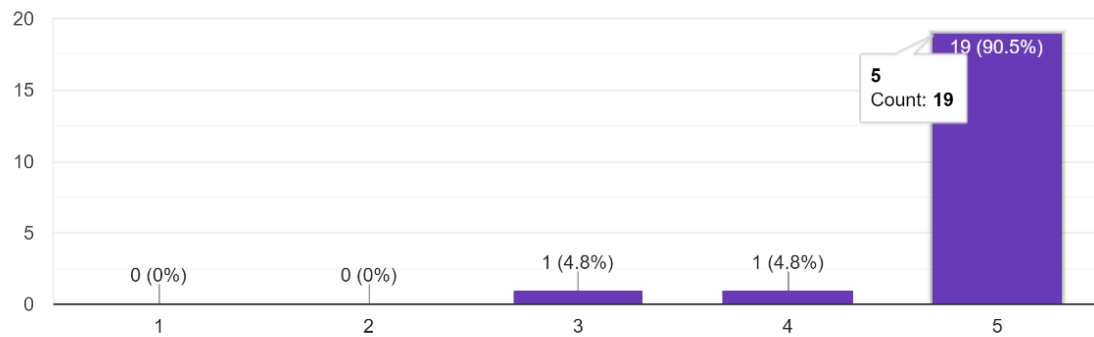
- Good
- Brief and very good introduction, presentation was excellent that covered all aspects of molecular biology
- Very good.
- I would like to see more practical part that day
- we did not receive pdf file
- Very good, covered a lot in small amount of time.
- Very good explanation but better to have more hours to give more explanation
- helpfull
- /
- That was hard part of the course if you don't work with PCR.
- Understood these methods but the time was limited.

- This could have taken more time, because I think it's very relevant. It gave me a nice overview and also some tricks to improve the method in our lab.
- It was ok
- Decent
- The teacher was very well prepared and the lecture was excellent but the time was too short. I would have liked to have better time for the technical background of qPCR in order to understand better the reading of the results.
- very good class to expand basic and specific knowledge of molecular biology
- Presenter is clearly experienced in a lab, but needs to work on presentation technique, especially in speaking more clearly.
- I loved the slides, the instructor did a great job considering the subject matter that needed to be covered. I wish we had more time though, because some of these areas I was not familiar with and although, I was getting the concepts, the speed with which the section moved was too fast.
- I knew most of what was explained but a few I didn't know.
- It was good but if you could send a document before the course like cell culture it'd be helpful to follow during the online meeting. it was difficult if you're not familiar with methods specifically RT-PCR
- Molecular methods are not my strength, the presenter have tried to explain the method in understanding way.

Course evaluation of Day 5

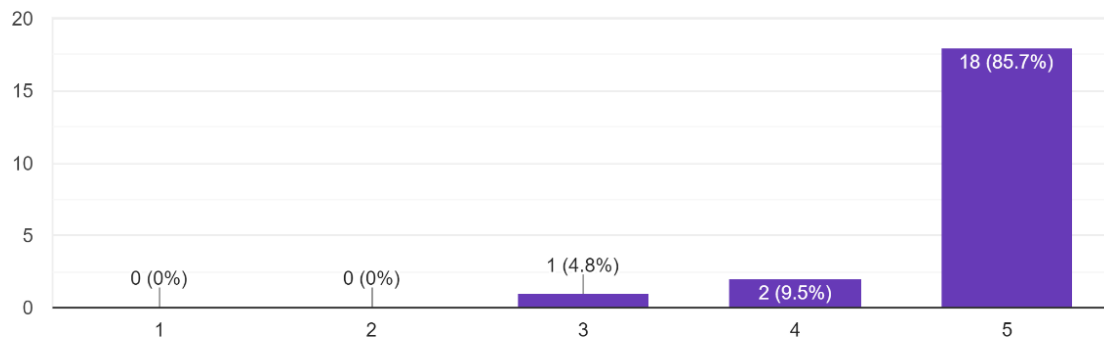
Day 5 - Assignment, discussion and conclusions - teachers' expertise

21 responses



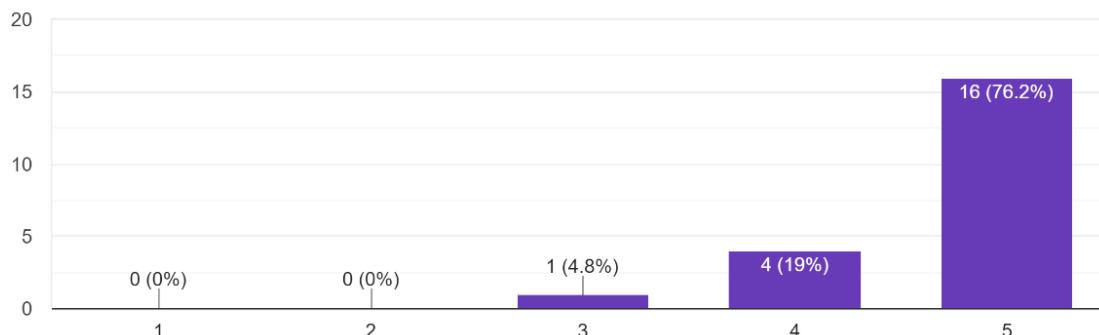
Day 5 - Assignment, discussion and conclusions - teachers' preparedness

21 responses



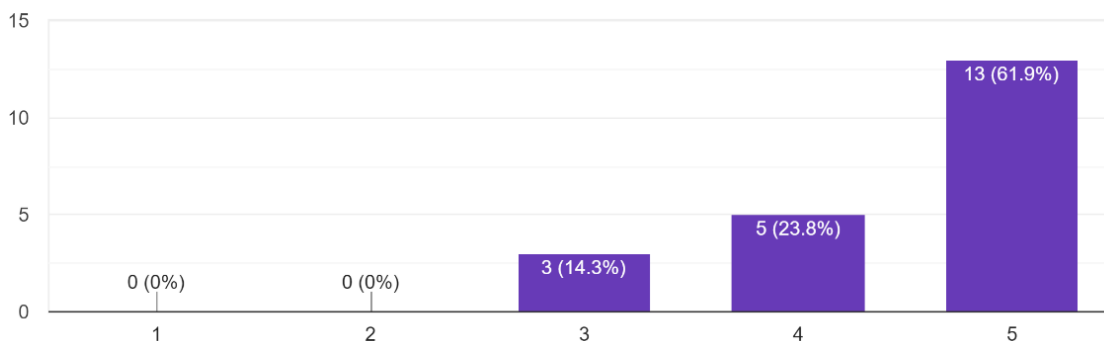
Day 5 - Assignment, discussion and conclusions - relevance for you

21 responses



Day 5 - Assignment, discussion and conclusions - increase of your knowledge

21 responses



Day 5 - Assignment, discussion and conclusions - general comment

- Good
- Work flow was well organized with lots of communications between all participants (cross meetings)
- Good. Perhaps second breakout room not required. Could give more time in 1st.
- Could it be possible to have a small video of showing the diagnostic procedure of the fish listed diseases? It could be a very good guidance to the new experts in the fish diseases.
- It was very useful to hear the experience of other participants
- Found this activity very useful and found help engage participants that were quiet in large group discussions.
- Very interactive session
- When assigning groups maybe a moderator should be named first for every group in order to avoid silence
- Avoid silence
- /

- Time was maybe too short for the group work.
- Increased interactions among participants. Enable us to go through the diagnostic methods and enhanced interactions. More of breakout sections in future zoom courses
- The questions for the discussion were really nice. It was repetition from the week, but this was fine and good.
- Maybe more time for discussion
- It was good to sum up the things we had learnt about in the week with the other people in the course. Perhaps it would have been clever to let us chat together in the end of each day...freely..in order to see what the others understood and what not.
- I can not value
- Should include more exercises like this one throughout the week.
- The assignment was great, for my group we worked on a disease that non of us were familiar with so that pushed us to applying what we had just learned and working together. This was a valuable exercise The time for the assignment was too short for us though, because we had to dig through the resources to get what we wanted.
- The last day was great since we had to use knowledge we learnt before plus find other and apply it.
- It was more productive day compare to other days. during the small group discussion the participant could share their own experinces. For the future project or collabration it was nice to get in touch each group member.
- Virtual discussion was a bit complicated , minor network blips can make discussions tricky, however considering that training was provided via zoom it was very good ,highly interactive , very informative. Thank you very much and best wishes for all upcoming training events.

Closing remarks

The EURL training course 2020 was - based on the very positive feedback from the participants - considered a success. The evaluation schemes enabled the participants to evaluate each day and topic on the course. A large majority of the participants evaluated the course as “very good”.

Due to the Covid-19 pandemics and the restrictions in travelling and gathering, this year the course has been organized virtually, giving us serious challenges to solve for teaching an on-hand course virtually. On the other hand the virtual course has allowed us to increase the number of participants to the course significantly as well as to expand the accessibility of countries located far from Denmark, and thereby providing the possibility to increase the expertise in National Reference Laboratories in EU and abroad.

All participants were registered on a daily basis, and all participated in the whole course. A signed certificate of participation was issued and send individually to the participant at the end of the course.

DTU-Aqua is acknowledged for offering training course facilities for free. Morten Fruergaard-Andreasen from the Danish Veterinary and Food Administration is deeply acknowledged for holding the lecture on sampling procedures for surveillance for listed fish disease in Denmark.

Copenhagen, Saturday, 02 January 2021

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