AQUAculture infrastructures for EXCELlence
in European fish research towards 2020 —
AQUAEXCEL2020

D4.4c Face-to-face training course 3
Institute of Marine Research/AquaTT

Executive Summary

Objectives

To educate a new generation of aquaculture researchers and industry stakeholders who focus on sustainable exploitation of their new knowledge, skills and tools to advance an innovative European aquaculture sector. The set-up of the training courses will centre on fostering a culture of cooperation between all parties involved.

Rationale:

To foster and build the human capital of the European aquaculture sector several goals are set by the Strategic Research and Innovation Agenda of EATiP to which AQUAEXCEL[2020] will contribute. All AQUAEXCEL[2020] training courses are multi-partner collaborations bringing together unique knowledge, tools and skills to create innovative modules that promote and enable peer-to-peer networking and collaboration. Participative training design ensures exchange and mutual learning between trainers and participants from both academia and industry. New models and partnerships for learning are explored for future recurrence, encouraging career development and innovation in the sector. Access to Research Infrastructures (knowledge, facilities and experience) will add value to the training. The training courses are state-of-the-art, transferring new knowledge and insights originating from the research and services carried out and created by AQUAEXCEL[2020], and building upon outputs, tools and achievements from FP7-AQUAEXCEL.

Main Results:

The AQUAEXCEL[2020] training course "Laboratory Animal Science for Aquatic Research Facilities" was the third face-to-face course in the AQUAEXCEL[2020] training course series and was provided by the Institute of Marine Research (IMR) (Norway), with the expertise of Nofima (Norway), Nancy-Université (France), Wageningen University & Research (WUR) (the Netherlands), Norwegian University of Science and Technology (NTNU) (Norway). The objective of this course was to train researchers in effective experimental design, experimental modelling, application of sampling regimes and maintenance of aquaculture systems by focusing on topics including; ways of Reducing, Refining and Replacing fish in experiments, transfer protocols for optimal welfare and performance, water quality and welfare in aquaculture, correct fish handling and scaling, and tank size and fish management.

This AQUAEXCEL[2020] training course took place in June 2019 with 22 participants attending, who were selected based on their submitted applications. The course included lectures, practical exercises, technical visits and a mini seminar. This mini seminar took place at Matre research station and covered the history of research on three major industry-related subjects; sexual maturation, skeletal deformities and cage environment, and fish welfare, and also described how small-scale animal research has been used to develop the industry techniques and solve their problems. This mini seminar gave the course participants a unique insight into the latest scientific advances in these important areas of laboratory animal science in aquatic research facilities.

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Contents

1. Introduction

AQUAEXCEL[2020] aims to foster a culture of cooperation between European aquaculture Research Infrastructures (RIs), the associated research community, the aquaculture industry and other relevant stakeholders, which will help develop a more efficient and attractive European aquaculture Research Area leading to a sustainable and globally competitive European aquaculture sector. One of AQUAEXCEL[2020]'s specific aims is to provide state-of-the-art unique training courses to educate a new generation of aquaculture researchers and industry stakeholders who focus on sustainable exploitation of their new knowledge, skills and tools to advance an innovative European aquaculture sector. Work Package 4 of AQUAEXCEL[2020] has a dedicated task focused on training a new generation of aquaculture researchers and industry stakeholders.

Nine technical training courses in total will be organised by different AQUAEXCEL[2020] partners offered to people within and outside the partnership. The courses will focus on different aspects of aquaculture experimentation to foster a culture of cooperation between all parties involved. These training sessions will transfer new knowledge and insights originating from the research and services carried out and created by AQUAEXCEL[2020].

This AQUAEXCEL[2020] training course which was held on "Laboratory Animal Science for Aquatic Research Facilities" was a five-day face-to-face course with the objectives of training researchers in effective experimental design, experimental modelling, application of sampling regimes and maintenance of aquaculture systems by focusing on topics including; ways of Reducing, Refining and Replacing fish in experiments, transfer protocols for optimal welfare and performance, water quality and welfare in aquaculture, correct fish handling and scaling, and tank size and fish management.

Experiments with fish usually involve extensive use of laboratory facilities and run for long periods of time. Understanding the European legislation around animal science in research and the ethical requirements to be considered when working with animals in aquatic research facilities is considered highly important for aquaculture researchers and industry stakeholders. The AQUAEXCEL[2020] project has an Ethics Advisor (EA) who is independent from the AQUAEXCEL[2020] consortium and is appointed by the Executive Committee. The remit of the EA is to ensure that all AQUAEXCEL[2020] research is carried out to a high ethical standard and complies with the 2010/63/EU Directive on the protection of animals used for scientific purposes, especially as it relates to the "3Rs" (replacement, reduction and refinement). This course was developed to cover the same content – European legislation and the 3 Rs.

In total 17 tutors contributed to this training course (see Annex 4). 16 tutors are working in research institutes which are partners in the AQUAEXCEL[2020] consortium (IMR, WU, NTNU, UL, Nofima) and one was an external contributor (NFSA). These leading experts presented on the current European legislation around animal science in research and the ethical requirements to be considered when working with animals in aquatic research facilities. The participants were trained in effective experimental design, experimental modelling, application of sampling regimes and maintenance of aquaculture systems by focusing on

topics including; ways of Reducing, Refining and Replacing (3Rs) fish in experiments, transfer protocols for optimal welfare and performance, water quality and welfare in aquaculture, correct fish handling and scaling, and tank size and fish management.

The laboratory animal science training course included i) legislation, ethics and the 3Rs and welfare, ii) experimental models and model animals, iii) experimental fish handling, iv) scaling and experimental design, v) modelling exercises vi) technical visits. Additionally, a mini industry related seminar was organised which included topics such as sexual maturation, skeletal deformities and cage environment, behaviour and fish welfare. This mini seminar was led by scientists working closely with the industry, giving the participants an insight into the latest discussions and scientific advances in the sector.

2. Face-to-face course 3

2.1   Pre-course activities

A promotional leaflet to promote the Training Course "Laboratory Animal Science for Aquatic Research Facilities" was developed (Figure 1) and distributed through several channels such as the AquaTT aquaculture mailing lists, the European Aquaculture Society (EAS) distribution channels, Federation of European Aquaculture Producers (FEAP) and European Aquaculture Technology and Innovation Platform (EATiP) distribution channels, EuroMarine (the European marine science network), the project website (Figure 2), social media and the partners' channels. Annex I shows the promotional leaflet.

Figure 1: Promotional leaflet for Laboratory Animal Science training course

Figure 2a: Screenshot of website promotion and application details for Laboratory Animal Science for Aquatic Research Facilities training course https://aquaexcel2020.eu/training-courses/upcoming-training-courses-apply-now

Figure 2b: Screenshot of website promotion (news section) for Laboratory Animal Science for Aquatic Research Facilities training course - https://aquaexcel2020.eu/news/apply-now-free-aquaexcel2020-training-course-laboratory-animal-science-aquatic-research

The application period of the course was open from 15 March 2019 until 18 April 2019 and applicants were required to complete a registration form (Annex 2) and a statement of motivation, and email both together with their CV to aquaexcel@aquatt.ie.

The target audience was primarily aquaculture researchers and students, and aquaculture industry stakeholders working directly with animals.

34 individuals in total applied to participate in this training course, while the maximum number of participants possible was 25. A selection procedure to create a shortlist was put in place by IMR to evaluate applicants based on their CVs and motivation letters. 25 participants were selected, while 22 attended due to some last minute cancellations.

The training programme from the AQUAEXCEL[2020] project is set up to improve the research capacity across Europe. The programme is targeted at training a new generation of aquaculture researchers and industry representatives working in the field in one of the EU member states or new members and associated states of the enlarged EU, facilitating access with special focus on young researchers. Based on this, participants were selected on the criteria: focus on candidates based in EU and new member states but including a few non-EU candidates where increased collaborations could be of benefit to Europe, and professionals and scientists working in the laboratory aquatic animal science field with the ability to contribute to improving research capacity in this area across Europe.

2.2   Course activities

25 aquaculture professionals from 13 different European countries were selected to attend the AQUAEXCEL[2020] face-to-face training course on Laboratory Animal Science for Aquatic Research Facilities. 22 of the selected participants attended the course (see participant list in Annex 5). The activities during the training course are presented in detail in the course agenda in Annex 3 and course tutors and their contact details are listed in Annex 4.

The course tutors emailed most of the lecture presentations to the participants after the training course. This included a modelling exercise for the participants to practice and a link to the FISHWELL book online (details below).

The first day of the training course began with a welcome from course tutor and organiser Tom Hansen of IMR. This was followed by a day of lectures including topics such as laboratory animal science legislation in Europe, severity assessment, larval quality in relation to welfare, the FISHWELL book, and a visit to the Disease challenge lab in Bergen which also included a presentation. The participants were given access to the web-based FISHWELL book which is a 350 page book covering fish welfare.

On the second day participants got a ferry to IMR's Austevoll research station. Participants learned about the research station, its facilities and animals, and about experimental models and model animals, CRISPr, and cell lines and primary cultures.

On the third day of the training course lecture topics included representative sampling from small and large fish groups, water quality and welfare, pros and cons in stress trial setups and minimum disturbance at sampling, transfer protocols for optimal welfare and performance in Atlantic salmon, and biosensors and tags.

The morning session of the fourth day of the training course was focused on experimental design and power and analysis, tank size and fish management history in experimental design matters, and welfare, stress and pain. The afternoon was dedicated to modelling, with the first session exploring a computer model for experimental planning. For the second session the participants carried out their own experiments in a modelling exercise.

The final day of the training course consisted of the mini industry seminar and was based in IMR's Matre facilities. The participants learned about IMR Matre, sexual maturation in fish, skeletal growth and deformities, and cage farming and its challenges, from scientists who have worked close to the industry for decades.

Figure 4a: Participants at IMR's Austevoll research station, Norway

Figure 4b: Participants viewing the cage facilities at IMR Matre, Norway.

Figure 4c: Participants at a lecture by Sylvain Milla (UL) during the training course in IMR.

2.3   Post-course activities

After completion of the course, participants were asked for feedback via an online survey (Figure 6), of which the results are given in Annex 7. These results will help the training course organisers to improve the distance learning course and future AQUAEXCEL[2020] face to face training courses, and evaluate the need for future laboratory animal science in aquatic research facilities training courses. The results of this evaluation exercise were confidential and anonymous so participants could be honest in their comments. The survey was online and took about 15 minutes to complete.

Figure 6: Print screen of welcome page of the online evaluation survey.

Participants were given a certificate of participation if requested upon completion of the course (Annex 8). Lectures were emailed to the participants after the course.

AquaTT organised pre- and post-course activities, such as finalising course design, developing a promotional leaflet, certificate of participation, and practical information documents, assisting in the organisation, managing the registrations, publishing and promoting the training courses, as well as carrying out and analysing the evaluations.

3. Conclusions

Most participants heard about the course through the AQUAEXCEL[2020] website (50%) and from colleagues (38%). 6% of participants found the course through an internet search and 6% heard about it through the AQUAEXCEL[2020] Twitter. The online feedback survey was answered by 19 attendees, and all results are included in Annex 7.

31% of the respondents received travel and subsistence funding to attend this course from their employers, while 25% were self-funded and 25% received project/grant funding.

The training course achieved the desired objective to train researchers in effective experimental design, experimental modelling, application of sampling regimes and maintenance of aquaculture systems by focusing on topics including; ways of Reducing, Refining and Replacing fish in experiments, transfer protocols for optimal welfare and performance, water quality and welfare in aquaculture, correct fish handling and scaling, and

tank size and fish management. This is evident as the percentage of respondents with detailed knowledge of laboratory animal science in aquatic research facilities increased from 31% before the course to 80% after the course. No respondents had expert knowledge of this area before the course, but this increased to 6% after the course. Before the course 18% of respondents felt they only had basic knowledge of this area, but after the course this decreased to 0%.

The respondents' feedback showed positive results of the course. 100% agreed that the course duration was good and that the procedure for registration was clear and simple, 94% agreed the information leaflet was informative and visually attractive, 88% agreed that the communication of the course was clear and 100% agreed that the information before the start of the course was clear. The main conclusion from this feedback is that the following AQUAEXCEL[2020] face-to-face training courses should follow the steps taken for this course in terms of registration, course duration, promotional leaflet and communication.

The majority of respondents gave the course a positive grade with 50% selecting a grade of good and 25% selecting a grade of excellent. 25% gave a grade of average to the overall course. No respondents rated the course poor or below average.

Some examples of reasons for the excellent grades were:

- *"It was a well-organized course. Especially, Visitation of the research station was logical and instructive."*
- *"It was an excellent where I learn a lot about the research they are doing in Norway and the facilities they are having"*

When deciding to enrol for the training course, 100% of respondents valued course content as a very or extremely important factor. 56% valued the course trainers as a very or extremely important factor, 62% valued the course as free to enrol as a very or extremely important factor and, 81% valued the course organisers as very or extremely important.

The best things about the training course which were mentioned by participants in the survey included:
- The field trips – "*the facilities available for your researchers were spectacular. The trips gave insight into how aquaculture research should be performed. Highly impressed!"*
- The opportunity for participants to exchange with the tutors.

Areas were there were suggestions for improvement for future AQUAEXCEL[2020] training courses included:
- Organization – "*for example it happen two times that there was no time to go for a lunch to institute's canteen."*
- *"Less talks and more lab work"*
- *"Not cover so many topics and concentrate on the most important."*
- *"During the course at least one sandwich could be given for lunch."*

For future laboratory animal science for aquatic research facilities courses participants suggested the following topics:

- Add other practical components to the course, such as proper netting techniques, and euthanising demonstration
- Legislation aspects on the use of fish and aquatic animals in lab experiments to be covered in more detail
- More information on early life stages

The overall results from the online survey show that the vast majority of respondents were very satisfied with their experience and increased their knowledge of laboratory animal science in aquatic research facilities. 92% of respondents indicated that they would be interested in attending a follow-up course, with the remaining 8% selecting maybe interested. An overwhelming 100% said that they would recommend this course to a fellow student/colleague. The survey results demonstrate how worthwhile and beneficial the participants found the course and how it has successfully increased knowledge of laboratory animal science in aquatic research facilities for all of the respondents.

Glossary

AQUAEXCEL[2020]: AQUAculture Infrastructures for EXCELlence in European Fish Research towards 2020

EA: Ethics Advisor

EAS: European Aquaculture Society

EATiP: European Aquaculture Technology and Innovation Platform

FEAP: Federation of European Aquaculture Producers

IMR: Institute of Marine Research

NFSA: Norwegian Food Safety Authority

NTNU: Norges Teknisknaturvitenskapelige Universitet

RI: Research Infrastructure

WU: Wageningen University

Document information

EU Project N°	652831	**Acronym**	AQUAEXCEL[2020]
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Project website	www.aquaexcel.eu		

Deliverable	N°	D4.4c	Title	Face-to-face training course 3
Work Package	**N°**	**4**	**Title**	**Integration, training, dissemination and cooperation**

Date of delivery	**Contractual**	07/2019 (Month 46)	**Actual**	9/5/2019 (Month 44)
Dissemination level	x	**PU Public, fully open, e.g. web**		
		CO Confidential, restricted under conditions set out in Model Grant Agreement		
		CI Classified, information as referred to in Commission Decision 2001/844/EC.		

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Version log			
Issue Date	**Revision N°**	**Author**	**Change**

Annex 1: Promotional Leaflet

AQUA EXCEL 2020
AQUAculture Infrastructures for EXCELlence in European fish research towards 2020

FACE-TO-FACE TRAINING COURSE: LABORATORY ANIMAL SCIENCE FOR AQUATIC RESEARCH FACILITIES

FREE TRAINING COURSE

DATE: 17-21 JUNE 2019   LOCATION: INSTITUTE OF MARINE RESEARCH, NORWAY

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COURSE DESCRIPTION

This course will give participants an insight into the current European legislation around animal science in research and the ethical requirements to be considered when working with animals in aquatic research facilities. This course will also train researchers in effective experimental design, experimental modelling, application of sampling regimes and maintenance of aquaculture systems by focusing on topics including; ways of Reducing, Refining and Replacing fish in experiments, transfer protocols for optimal welfare and performance, water quality and welfare in aquaculture, correct fish handling and scaling, and tank size and fish management.

COURSE CONTENT

The course will consist of five days of lectures, exercises, mini seminars and site visits designed and provided by a range of experts from around Europe. Each day will focus on a specific aspect of animal science for aquatic research facilities, these include;

• Legislation, ethics and the 3Rs and welfare
• Experimental models and model animals
• Experimental fish handling
• Scaling and experimental design

During the course there will be visits to two IMR research stations, namely the Austevoll research station (https://bit.ly/2TxUHZ3) and the Matre research station (https://bit.ly/2WGca3A), which will include a mini seminar entitled 'From Laboratory to Industry'.

There will also be opportunities for participants to take part in modelling exercises, putting into practice skills learned from the lectures and talks provided.

COURSE ORGANISERS

The Institute of Marine Research (IMR)(Norway), with the assistance and expertise of Nofima (Norway), Nancy-Université (France), Wageningen University & Research (WUR)(the Netherlands), Norwegian University of Science and Technology (NTNU)(Norway)

✔@aquaexcel2020
www.aquaexcel2020.eu

AQUA EXCEL 2020

AQUAculture Infrastructures for EXCELlence in European fish research towards 2020

FACE-TO-FACE TRAINING COURSE: LABORATORY ANIMAL SCIENCE FOR AQUATIC RESEARCH FACILITIES

DATE: 17-21 JUNE 2019 LOCATION: INSTITUTE OF MARINE RESEARCH, NORWAY

FREE TRAINING COURSE

TARGET AUDIENCE

Primarily aquaculture researchers and students and aquaculture industry stakeholders working directly with animals.

COURSE TUTORS

Name: Tom Hansen
Position: Researcher
Organisation:
Institute of Marine Research
Contact details:
tomh@hi.no

Tom Hansen is a leading researcher in animal science, reproduction and developmental biology and has vast experience working in aquatic research facilities.

Name: Ragnar Nortvedt
Position: Station manage
Organisation:
Matre Research Station, Institute of Marine Research
Contact details:
ragnar.nortvedt@hi.no

Ragnar Nortvedt is station manager at Matre Research Station and has more than 30 years of experience in fish welfare and nutrition, both as principal scientist and from industry

A full overview of all course tutors can be found on the website, and includes AQUAEXCEL[2020] partners from Nofima (Norway), Nancy-Université (France), Wageningen University & Research (WUR)(the Netherlands), Norwegian University of Science and Technology (NTNU)(Norway)

PRACTICAL INFORMATION

Location: Institute of Marine Research, Bergen, Norway
Date: 17-21 June 2019
Application deadline: 8 April 2019
Language of instruction & material: English
Fees: Course attendance is FREE, thanks to European Commission Horizon 2020 funding. Participants are expected to pay for their own travel, subsistence and accommodation.
Maximum Participants: 25

REGISTRATION

Official registration forms and additional course information can be found on the AQUAEXCEL[2020] website at: https://aquaexcel2020.eu/training-courses/upcoming-training-courses-apply-now

Note: Please do not make travel arrangements unless you have received official confirmation of selection.

Designed and developed by Aqua TT

@aquaexcel2020
www.aquaexcel2020.eu

Annex 2: Application form for training course

Registration Form for AQUAEXCEL2020 Face-to-Face Training Course: Laboratory Animal Science for Aquatic Resea

Organiser(s): The Institute of Marine Research (IMR)(Norway)
Dates: 17-21 June 2019
Location: Institute of Marine Research, Bergen, Norway

Course attendance is free, thanks to EC H2020 funding. Participants are expected to pay for their own travel, subsistence and accommodation. Places wi
course will be confirmed officially through e-mail. **Please do not make travel arrangements unless you have received official confirmation.**

To submit your registration request, please send the following four documents to aquaexcel@aquatt.ie, with the following subject line: **AQUAEXCEL202**
- **This registration form completed in full**
- **CV / Resumé**
- **Letter of Motivation**
- **Completed GDPR consent form**

Any questions about the course or application process should be sent to **aquaexcel@aquatt.ie**

Personal details

Title e.g. Mr, Ms, Dr, Prof	Family name	First Name	Email	Phone number please include international dialling code	Date of birth In format dd/mm/yyyy	Gender	Organisation name

...arch Facilities

...ill be confirmed, at the latest, one month before the start of the training course. Admittance to the

...20 /TrainingCourse_ Lab_IMR by the **8th of April 2019**

Organisation Type	Country	Position	Highest qualification	Research category	Previous relevant experience	Additional support

Annex 3: Course Agenda

Monday 17 June Legislation, ethics and 3R's and welfare	Tuesday 18 June Experimental models and model animals	Wednesday 19 June Experimental fish handling	Thursday 20 June Scaling and experimental design	Friday 21 June Visit and mini seminar
Welcome and introduction (Tom Hansen, IMR) *The laboratory animal legislation in Europe – what is it and why? (Dag Atle Tuft, NFSA)* *Severity assessment (Frode Oppedal, IMR)* *Larval quality in relation to welfare (Elin Kjørsvik, NTNU)* *FISHWELL (Jonathan Nilsson, IMR)* *The Disease challenge lab in Bergen with its studies and experimental animals. Nina Sandlund and Joachim Nordbø (IMR)*	*Bus from Bergen 0745* *Ferry from Krokeide 0855* *1000-1200 Austevoll research station with it studies and experimental animals. Birgitta Norberg (IMR)* *1200-1230 Lunch* *Experimental models and model animals (e.g. Inbreds/clones, monosex, sterile fish (Tom Hansen, IMR).* *CRISPr what is it and what can it do? (Lene Kleppe, IMR)* *Cell lines and primary cell cultures – why and what can they do? (Liv Søfteland, IMR)* *Ferry from Hufthamar 1540* *In Bergen at approx 1650*	*Course start 0830* *Representative sampling from small and large fish groups (Jonathan Nilsson, IMR).* *Water quality and welfare (Ep Eding, WUR)* *Pros and cons in stress trial setups and minimum disturbance at sampling (Signe Dille Løvmo, NTNU).* *Transfer protocols for optimal welfare and performance in Atlantic salmon (Åsa Espmark, NOFIMA).* *Fish transport (Ragnar Nortvedt, IMR)* *Biosensors and tags (Martin Føre, NTNU)*	*Course start 0830* *Experimental design and power analysis (Ragnar Nortvedt, IMR)* *Tank size and fish management history in experimental design matters (Åsa Espmark, Nofima)* *Welfare, stress and pain (Sylvain Milla, UL)* *A computer model for experimental planning (Martin Føre, NTNU)* *Afternoon model exercises for course participants (Martin Føre, NTNU)*	*Bus from Bergen 0830* *Visit to IMR Matre 1000* *1000-1200 IMR Matre its history and present (Ragnar Nortvedt, IMR)* *1200-1230 Lunch* *Sexual maturation (Tom Hansen, IMR)* *Skeletal growth and deformities (Per Gunnar Fjelldal, IMR)* *Cage farming and its challenges (Frode Oppedal, IMR).* *Bus from Matre 1430* *In Bergen at approx. 1600*

Annex 4: Course Tutors

Annex 5: Participant List: Training Course

Annex 6. Participant list: Industry seminar

Annex 7. Survey results

1. 1. What is your current research category?
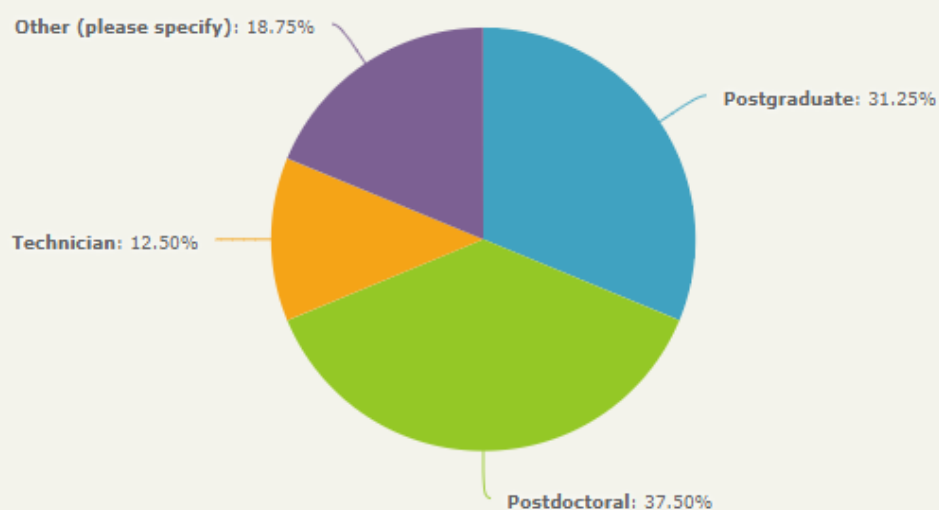
Postgraduate	31.25%		5
Postdoctoral	37.50%		6
Expert	0.00%		0
Technician	12.50%		2
Máster	6.25%		1
PhD candidate	6.25%		1
PhD Student	6.25%		1
		Total Responses	16
		Skipped	3

2. 2. How did you hear about this course?
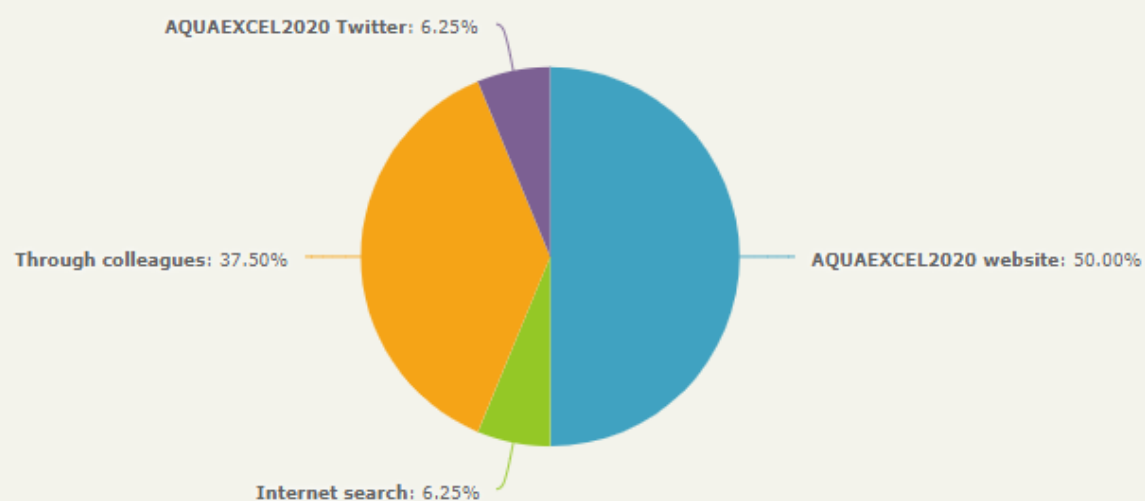
AQUAEXCEL2020 website	50.00%	8
Internet search	6.25%	1
Through colleagues	37.50%	6
AQUAEXCEL2020 Twitter	6.25%	1
	Total Responses	16
	Skipped	3

3. 3. How would you rate your knowledge of laboratory animal science in aquatic research facilities:
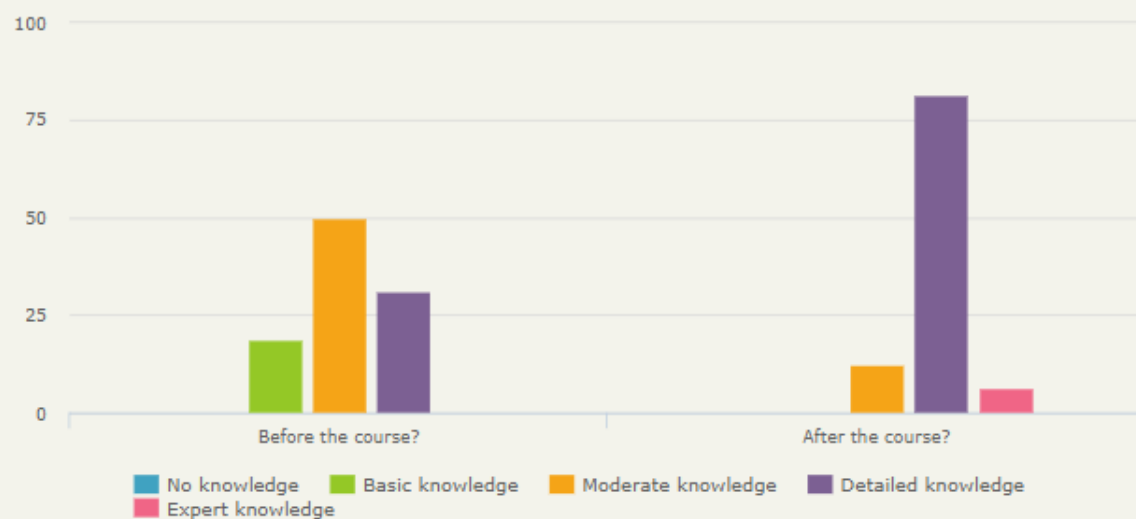
	No knowledge	Basic knowledge	Moderate knowledge	Detailed knowledge	Expert knowledge	Responses
Before the course?	0 0.00%	3 18.75%	8 50.00%	5 31.25%	0 0.00%	16
After the course?	0 0.00%	0 0.00%	2 12.50%	13 81.25%	1 6.25%	16

Total Responses	16
Skipped	3

4. **4. How important were the following factors for you when deciding to enrol into this training course?**
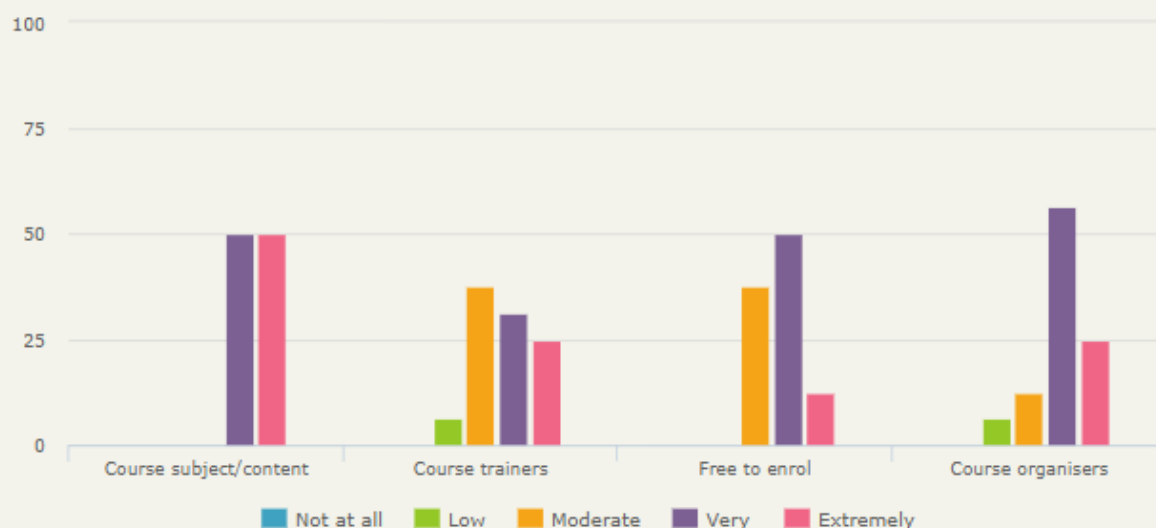
	Not at all	Low	Moderate	Very	Extremely	Responses
Course subject/content	0 0.00%	0 0.00%	0 0.00%	8 50.00%	8 50.00%	16
Course trainers	0 0.00%	1 6.25%	6 37.50%	5 31.25%	4 25.00%	16
Free to enrol	0 0.00%	0 0.00%	6 37.50%	8 50.00%	2 12.50%	16
Course organisers	0 0.00%	1 6.25%	2 12.50%	9 56.25%	4 25.00%	16

Total Responses	16
Skipped	3

5. 5. How were you funded/how did you fund the travel and subsistence expenses?

Other (please specify): 18.75%

Self-funded: 25.00%

Project / grant funding: 25.00%
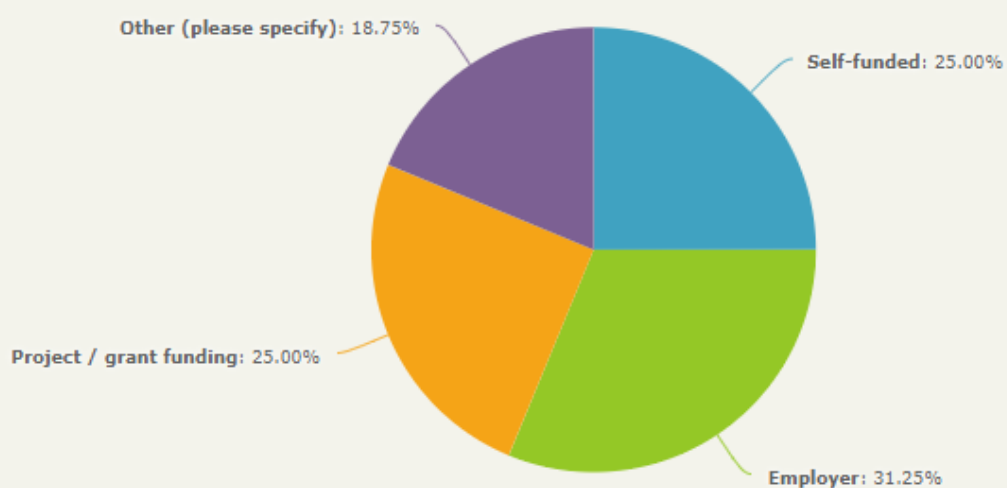
Employer: 31.25%

Self-funded	25.00%		4
Employer	31.25%		5
Project / grant funding	25.00%		4
Company	6.25%		1
General Directorate	6.25%		1
Self-funding and grant funding	6.25%		1
		Total Responses	16
		Skipped	3

6. 6. Please read the following statements and indicate how they correspond to your experience of the course organisation.
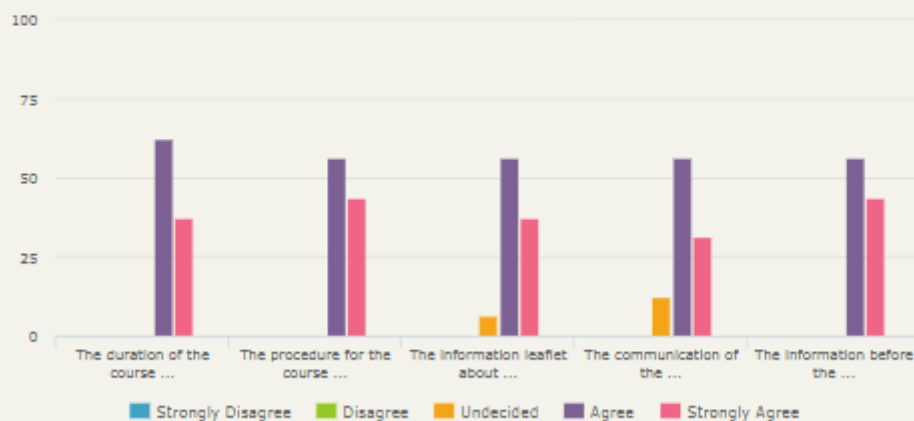
	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Responses
The duration of the course was good.	0 0.00%	0 0.00%	0 0.00%	10 62.50%	6 37.50%	16
The procedure for the course registration was clear and simple.	0 0.00%	0 0.00%	0 0.00%	9 56.25%	7 43.75%	16
The information leaflet about the course was informative and visually attractive.	0 0.00%	0 0.00%	1 6.25%	9 56.25%	6 37.50%	16
The communication of the course (announcements, programme, etc.) was good.	0 0.00%	0 0.00%	2 12.50%	9 56.25%	5 31.25%	16
The information before the start of the course was clear.	0 0.00%	0 0.00%	0 0.00%	9 56.25%	7 43.75%	16
				Total Responses		16
				Skipped		3

7. 7. Do you have any more feedback on the organisation of the course?

Count	Response
1	Information regarding the lunch schedule was unclear - i.e. local availability, canteen option, should we bring food with us..
1	NO
1	Talks were amazing, even though, too much info and not practical tasks
1	The organizers of the course and all the team were so helpful and attentive, especially Tom Hansen and Ragnar Nortvedt. Than you very much for your reception and the experience you gave us!
1	Very well organised with clear instructions for all travel both before and during the course.. Course content varied with good practical examples backed up by paper presentations

Total Responses	5
Skipped	14

8. 8. Please read the following statements and indicate how they correspond to your experience of the course.
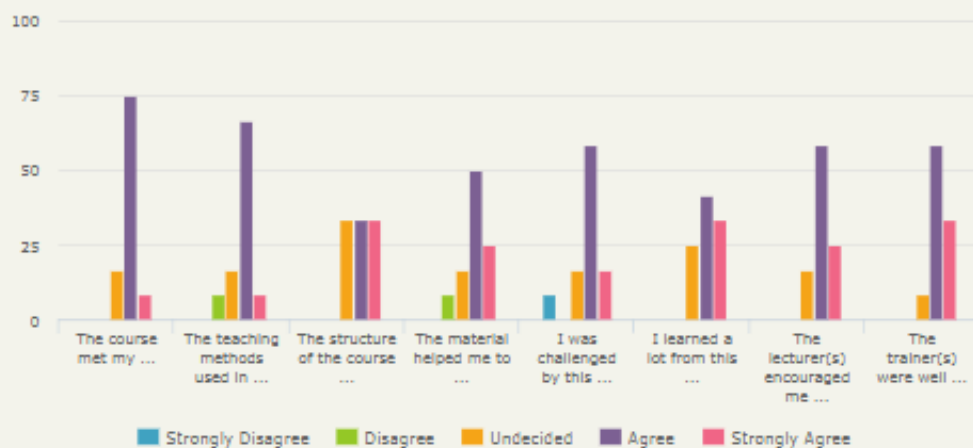
	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Responses
The course met my expectations.	0 0.00%	0 0.00%	2 16.67%	9 75.00%	1 8.33%	12
The teaching methods used in this course helped me achieve the course's learning outcomes.	0 0.00%	1 8.33%	2 16.67%	8 66.67%	1 8.33%	12
The structure of the course was logical.	0 0.00%	0 0.00%	4 33.33%	4 33.33%	4 33.33%	12
The material helped me to master the content.	0 0.00%	1 8.33%	2 16.67%	6 50.00%	3 25.00%	12
I was challenged by this course.	1 8.33%	0 0.00%	2 16.67%	7 58.33%	2 16.67%	12
I learned a lot from this course.	0 0.00%	0 0.00%	3 25.00%	5 41.67%	4 33.33%	12
The lecturer(s) encouraged me to think about the subject matter.	0 0.00%	0 0.00%	2 16.67%	7 58.33%	3 25.00%	12
The trainer(s) were well prepared and knowledgeable.	0 0.00%	0 0.00%	1 8.33%	7 58.33%	4 33.33%	12
				Total Responses		12
				Skipped		7

9. 9. If you look at all aspects of the course, which grade would you award this course?

Excellent: 25.00%　　　　　　　　　　　　　　　　Average: 25.00%
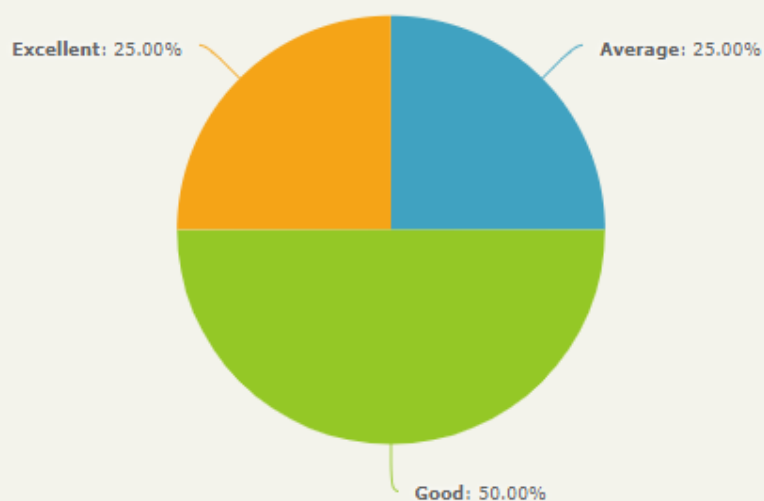
Good: 50.00%

Poor	0.00%		0
Below Average	0.00%		0
Average	25.00%		3
Good	50.00%		6
Excellent	25.00%		3
		Total Responses	12
		Skipped	7

10. 10. Please comment on the grade you gave the course (question number 9):

Count	Response
1	I learned quite a lot and got good insight into the norwegian research lanscape. However, the course was not challenging as almost all sessions were traditional lectures with no active learning initiatives such as exercises or mini projects. (yes there was one exercise planed but in the end it was more a small homework). So a more interactive structure would be appreciated.
1	I was expecting more activities
1	It was a well-organized course. Especially, Visitation of the research station was logical and instructive.
1	It was an excellent where I learn a lot about the research they are doing in Norway and the facilities they are having
1	some of the lecturers appeared to had not prepared the course at all.
1	Some trainers gave important information, while other just focus on basic concepts.
1	Thoroughly enjoyed most of the lectures. One or two of the lecturers however, did not really interact with the class (i.e. simple eye contact, reading off the slides with no extra information), which made it difficult to maintain interest levels.

Total Responses	7
Skipped	12

11. 11. The best thing(s) about this course was/were:

Count	Response
1	Field visits
1	Fish welfare presentations Technical visits to research stations
1	Matre Research Station
1	The exchange experience with participants and trainers.
1	The facilities
1	The field trips - the facilities available for your researchers were spectacular. The trips gave insight into how aquaculture research should be performed. Highly impressed!
1	The field visits and conversations with the staff
1	The mix between lessons and visits
1	The visit to the facilities
1	the visit to the research stations and direct information with the technicians that work there day by day
1	Visit of Austewoll and Matre research station.

Total Responses	11
Skipped	8

13. 13. Did you miss any subjects/topics?

Please indicate any topics that, in your opinion, should

have been included in the course:

Count	Response
1	I was not present on day 5.
1	I work with fish larvae so I miss more information regarding to early life stages.
1	mor eand lear informaion about laws and legislation in the european union for doing research in aquaculture
1	Non vertebrate aquatic animals
1	Would it be possible to add a practical component to the course - proper netting technique, euthanising demonstration?

Total Responses	5
Skipped	14

14. 14. How would you rate the quality of the following parts from Day 1?
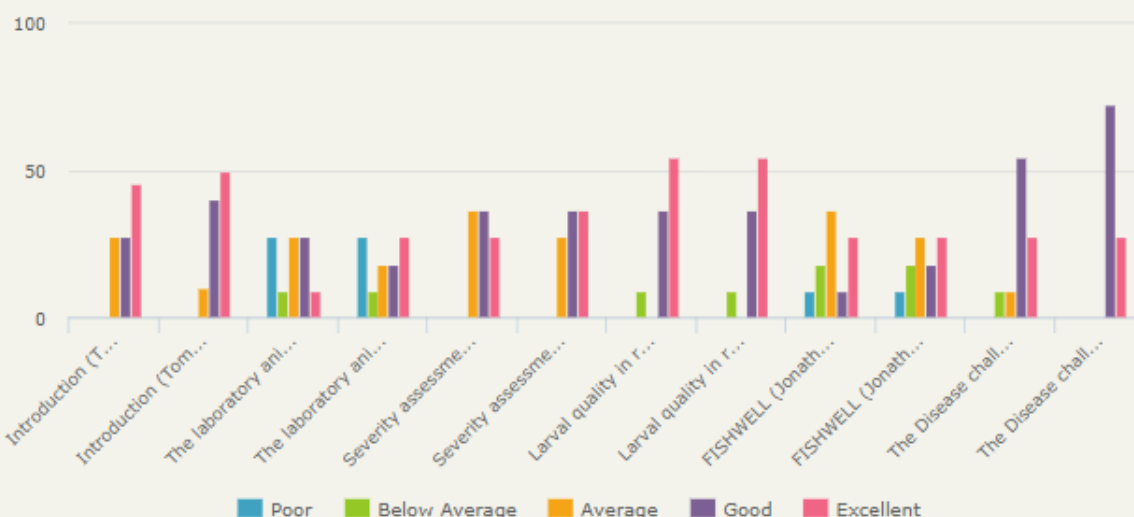
	Poor	Below Average	Average	Good	Excellent	Responses
Introduction (Tom Hansen, IMR) - **presentation and materials**	0 0.00%	0 0.00%	3 27.27%	3 27.27%	5 45.45%	11
Introduction (Tom Hansen, IMR) - **relevance**	0 0.00%	0 0.00%	1 10.00%	4 40.00%	5 50.00%	10
The laboratory animal legislation in Europe – what is it and why? (Dag Atle Tuft, NFSA) - **presentation and materials**	3 27.27%	1 9.09%	3 27.27%	3 27.27%	1 9.09%	11
The laboratory animal legislation in Europe – what is it and why? (Dag Atle Tuft, NFSA) - **relevance**	3 27.27%	1 9.09%	2 18.18%	2 18.18%	3 27.27%	11
Severity assessment (Frode Oppedal, IMR) - **presentation and materials**	0 0.00%	0 0.00%	4 36.36%	4 36.36%	3 27.27%	11

Severity assessment (Frode Oppedal, IMR) - **relevance**	0 0.00%	0 0.00%	3 27.27%	4 36.36%	4 36.36%	11
Larval quality in relation to welfare (Elin Kjørsvik, NTNU) - **presentation and materials**	0 0.00%	1 9.09%	0 0.00%	4 36.36%	6 54.55%	11
Larval quality in relation to welfare (Elin Kjørsvik, NTNU) - **relevance**	0 0.00%	1 9.09%	0 0.00%	4 36.36%	6 54.55%	11
FISHWELL (Jonathan Nilsson, IMR) - **presentation and materials**	1 9.09%	2 18.18%	4 36.36%	1 9.09%	3 27.27%	11
FISHWELL (Jonathan Nilsson, IMR) - **relevance**	1 9.09%	2 18.18%	3 27.27%	2 18.18%	3 27.27%	11
The Disease challenge lab in Bergen with its studies and experimental animals. Nina Sandlund and Joachim Nordbø (IMR) - **organisation of visit**	0 0.00%	1 9.09%	1 9.09%	6 54.55%	3 27.27%	11
The Disease challenge lab in Bergen with its studies and experimental animals. Nina Sandlund and Joachim Nordbø (IMR) - **relevance**	0 0.00%	0 0.00%	0 0.00%	8 72.73%	3 27.27%	11

Total Responses	11
Skipped	8

15. **15. How would you rate the quality of the following parts from Day 2?**
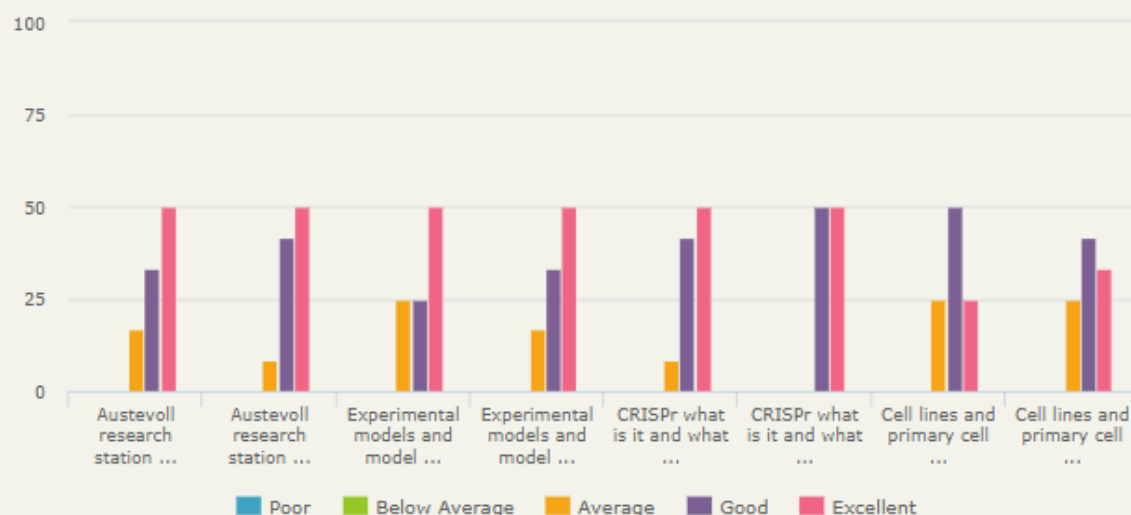
	Poor	Below Average	Average	Good	Excellent	Responses
Austevoll research station with it studies and experimental animals. Birgitta Norberg (IMR)- **organisation of visit**	0 0.00%	0 0.00%	2 16.67%	4 33.33%	6 50.00%	12
Austevoll research station with it studies and experimental animals. Birgitta Norberg (IMR)- **relevance**	0 0.00%	0 0.00%	1 8.33%	5 41.67%	6 50.00%	12
Experimental models and model animals (Tom Hansen, IMR) - **presentation and materials**	0 0.00%	0 0.00%	3 25.00%	3 25.00%	6 50.00%	12
Experimental models and model animals (Tom Hansen, IMR) - **relevance**	0 0.00%	0 0.00%	2 16.67%	4 33.33%	6 50.00%	12

CRISPr what is it and what can it do? (Lene Kleppe, IMR) - **presentation and materials**	0 0.00%	0 0.00%	1 8.33%	5 41.67%	6 50.00%	12
CRISPr what is it and what can it do? (Lene Kleppe, IMR) - **relevance**	0 0.00%	0 0.00%	0 0.00%	6 50.00%	6 50.00%	12
Cell lines and primary cell cultures – why and what can they do? (Liv Søfteland, IMR) - **presentation and materials**	0 0.00%	0 0.00%	3 25.00%	6 50.00%	3 25.00%	12
Cell lines and primary cell cultures – why and what can they do? (Liv Søfteland, IMR) - **relevance**	0 0.00%	0 0.00%	3 25.00%	5 41.67%	4 33.33%	12

Total Responses	12
Skipped	7

16. 16. How would you rate the quality of the following parts from Day 3?
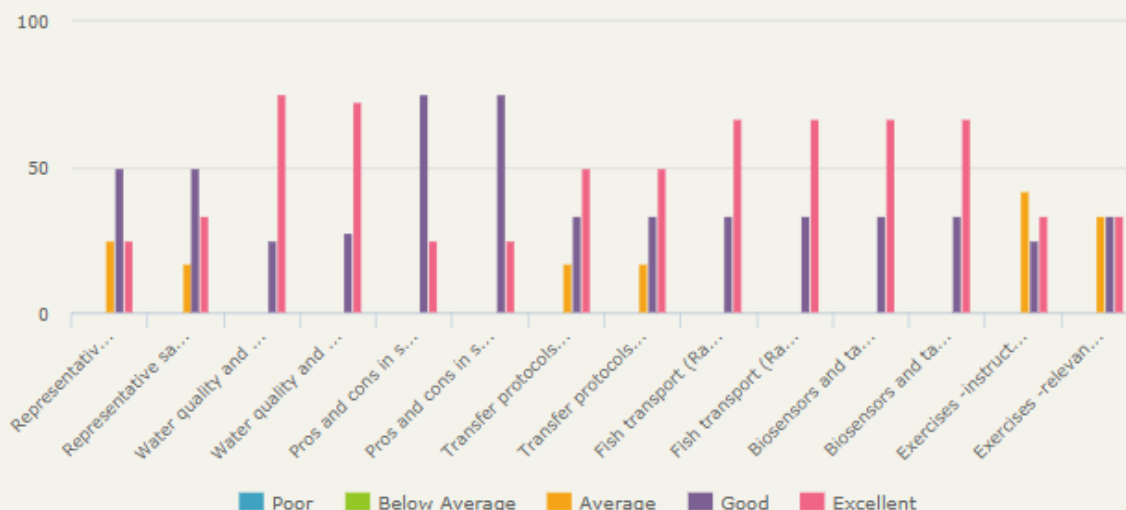
	Poor	Below Average	Average	Good	Excellent	Responses
Representative sampling from small and large fish groups (Jonathan Nilsson, IMR) - **presentation and materials**	0 0.00%	0 0.00%	3 25.00%	6 50.00%	3 25.00%	12
Representative sampling from small and large fish groups (Jonathan Nilsson, IMR) - **relevance**	0 0.00%	0 0.00%	2 16.67%	6 50.00%	4 33.33%	12
Water quality and welfare (Ep Eding, WUR) - **relevance**	0 0.00%	0 0.00%	0 0.00%	3 25.00%	9 75.00%	12
Water quality and welfare (Ep Eding, WUR) - **presentation and materials**	0 0.00%	0 0.00%	0 0.00%	3 27.27%	8 72.73%	11
Pros and cons in stress trial setups and minimum disturbance at sampling (Signe Dille Løvmo, NTNU) - **presentation and materials**	0 0.00%	0 0.00%	0 0.00%	9 75.00%	3 25.00%	12

Pros and cons in stress trial setups and minimum disturbance at sampling (Signe Dille Løvmo, NTNU) - **relevance**	0 0.00%	0 0.00%	0 0.00%	9 75.00%	3 25.00%	12
Transfer protocols for optimal welfare and performance in Atlantic salmon (Åsa Espmark, NOFIMA) - **presentation and materials**	0 0.00%	0 0.00%	2 16.67%	4 33.33%	6 50.00%	12
Transfer protocols for optimal welfare and performance in Atlantic salmon (Åsa Espmark, NOFIMA) - **relevance**	0 0.00%	0 0.00%	2 16.67%	4 33.33%	6 50.00%	12
Fish transport (Ragnar Nortvedt, IMR) - **presentation and materials**	0 0.00%	0 0.00%	0 0.00%	4 33.33%	8 66.67%	12
Fish transport (Ragnar Nortvedt, IMR) - **relevance**	0 0.00%	0 0.00%	0 0.00%	4 33.33%	8 66.67%	12
Biosensors and tags (Martin Føre, NTNU) - **presentation and materials**	0 0.00%	0 0.00%	0 0.00%	4 33.33%	8 66.67%	12
Biosensors and tags (Martin Føre, NTNU) - **relevance**	0 0.00%	0 0.00%	0 0.00%	4 33.33%	8 66.67%	12
Exercises - **instruction**	0 0.00%	0 0.00%	5 41.67%	3 25.00%	4 33.33%	12
Exercises - **relevance**	0 0.00%	0 0.00%	4 33.33%	4 33.33%	4 33.33%	12

Total Responses	12
Skipped	7

17. **17. How would you rate the quality of the following parts from Day 4?**

	Poor	Below Average	Average	Good	Excellent	Responses
Experimental design and power analysis (Ragnar Nortvedt, IMR) - **presentation and materials**	0 0.00%	0 0.00%	2 16.67%	4 33.33%	6 50.00%	12
Experimental design and power analysis (Ragnar Nortvedt, IMR) - **relevance**	0 0.00%	0 0.00%	1 8.33%	5 41.67%	6 50.00%	12
Tank size and fish management history in experimental design matters (Åsa Espmark, Nofima) - **presentation and materials**	0 0.00%	0 0.00%	2 16.67%	6 50.00%	4 33.33%	12
Tank size and fish management history in experimental design matters (Åsa Espmark, Nofima) - **relevance**	0 0.00%	0 0.00%	1 8.33%	7 58.33%	4 33.33%	12

Welfare, stress and pain (Sylvain Milla, UL) - **relevance**	**0** 0.00%	**0** 0.00%	**1** 8.33%	**4** 33.33%	**7** 58.33%	12
A computer model for experimental planning (Martin Føre, NTNU) - **presentation and materials**	**0** 0.00%	**0** 0.00%	**2** 18.18%	**5** 45.45%	**4** 36.36%	11
A computer model for experimental planning (Martin Føre, NTNU) - **relevance**	**0** 0.00%	**0** 0.00%	**2** 18.18%	**5** 45.45%	**4** 36.36%	11
Afternoon model exercises for course participants (Martin Føre, NTNU) - **instruction**	**0** 0.00%	**0** 0.00%	**3** 27.27%	**4** 36.36%	**4** 36.36%	11
Afternoon model exercises for course participants (Martin Føre, NTNU) - **relevance**	**0** 0.00%	**0** 0.00%	**3** 27.27%	**3** 27.27%	**5** 45.45%	11

Total Responses	12
Skipped	7

18. 18. How would you rate the quality of the following parts from Day 5?

	Poor	Below Average	Average	Good	Excellent	Responses
Visit to IMR Matre – **organisation of visit**	0 0.00%	0 0.00%	0 0.00%	2 18.18%	9 81.82%	11
Visit to IMR Matre- **relevance**	0 0.00%	0 0.00%	0 0.00%	2 18.18%	9 81.82%	11
IMR Matre its history and present (Ragnar Nortvedt, IMR)- **presentation and materials**	0 0.00%	0 0.00%	0 0.00%	3 27.27%	8 72.73%	11
IMR Matre its history and present (Ragnar Nortvedt, IMR)- **relevance**	0 0.00%	0 0.00%	0 0.00%	3 27.27%	8 72.73%	11
Sexual maturation (Tom Hansen, IMR)- **presentation and materials**	0 0.00%	0 0.00%	1 9.09%	5 45.45%	5 45.45%	11
Sexual maturation (Tom Hansen, IMR)- **relevance**	0 0.00%	0 0.00%	1 9.09%	5 45.45%	5 45.45%	11

Skeletal growth and deformities (Per Gunnar Fjelldal, IMR)- **presentation and materials**	0 0.00%	0 0.00%	5 45.45%	1 9.09%	5 45.45%	11
Skeletal growth and deformities (Per Gunnar Fjelldal, IMR)- **relevance**	0 0.00%	0 0.00%	3 27.27%	2 18.18%	6 54.55%	11
Cage farming and its challenges (Frode Oppedal, IMR) - **presentation and materials**	0 0.00%	0 0.00%	1 9.09%	4 36.36%	6 54.55%	11
Cage farming and its challenges (Frode Oppedal, IMR)- **relevance**	0 0.00%	0 0.00%	1 9.09%	4 36.36%	6 54.55%	11

Total Responses	11
Skipped	8

19. 19. How would you rate the quality of the Industry Mini Seminar on Day 5?

	Poor	Below Average	Average	Good	Excellent	Responses
Mini seminar with industry partners - **opportunities for exchange**	2 25.00%	0 0.00%	2 25.00%	1 12.50%	3 37.50%	8
Mini seminar with industry partners - **representation of industry experts**	2 25.00%	0 0.00%	2 25.00%	1 12.50%	3 37.50%	8
Mini seminar with industry partners - **concept**	2 25.00%	0 0.00%	2 25.00%	1 12.50%	3 37.50%	8

Total Responses	8
Skipped	11

20. **20. How beneficial was the opportunity to exchange with industry professionals for you personally during the Industry Seminar on Day 5?**
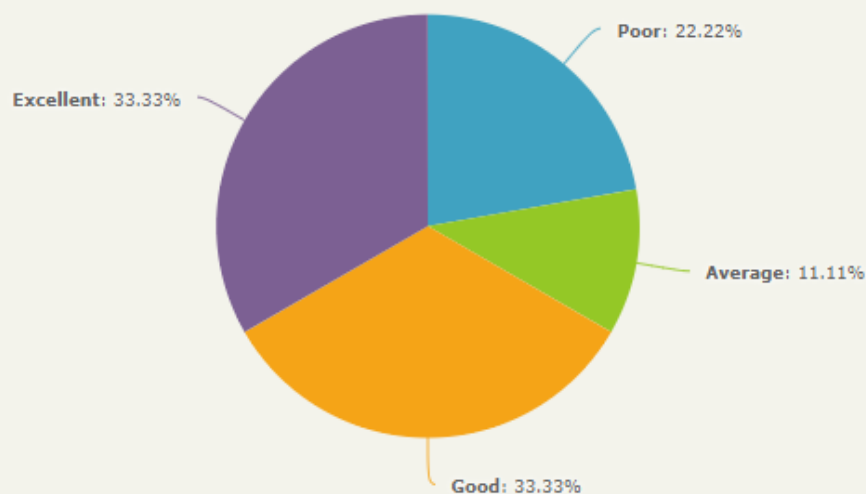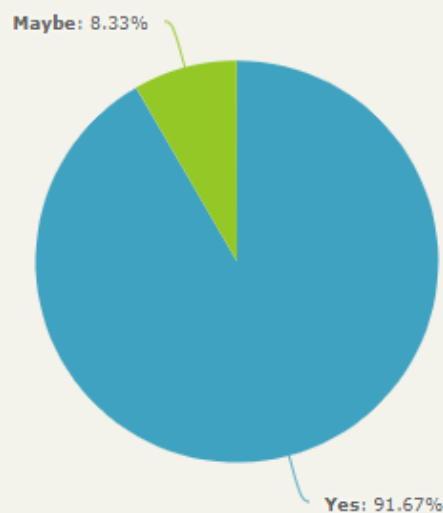

Poor	22.22%	2
Below Average	0.00%	0
Average	11.11%	1
Good	33.33%	3
Excellent	33.33%	3
	Total Responses	9
	Skipped	10

21. **21. Please suggest changes and/or improvements you would like to see made to the trainers' approach to teaching and facilitating:**

Count	Response
1	I don't recall the Industry mini seminar.
1	Please include practical sessions.
1	See above...
1	was there a seminar with the industry last day?

Total Responses	4
Skipped	15

22. 22. Would you like to attend a follow-up course in the future.

Maybe: 8.33%

Yes: 91.67%

Yes	91.67%		11
No	0.00%		0
Maybe	8.33%		1
		Total Responses	12
		Skipped	7

23. **23. Would you recommend this course to a fellow student/colleague?**

Yes: 100.00%

|			
Yes	100.00%		11
No	0.00%		0
Maybe	0.00%		0
		Total Responses	11
		Skipped	8

24. 24. Please describe your learning experience in "Twitter" style (280 characters or less):

Count	Response
1	An excellent face-to-face course experience in #Bergen's #fjords.
1	An excellent general course where all the aspect regarding culturing fishes for experimental purposes are studied
1	General overview over the Norwegian aquaculture practices with interesting lectures and field visits. The learning methodology with predominantly traditional lectures could be improved.
1	Great course. Thanks to Aquaexcel 2020 and IMR Bergen, Norway for a wonderful and great training. I was fascinated by Norwegian technologies which are used in aquaculture research. Presenters kept the course lively and gave a great effort to give lots of information.

Total Responses	4
Skipped	15

25. **25. The Laboratory Animal Science for Aquatic Research Facilities course was subsidised. What would be the maximum amount you/your company could afford to pay for a similar course?**

< €3,000: 9.09%

< €2,000: 9.09%
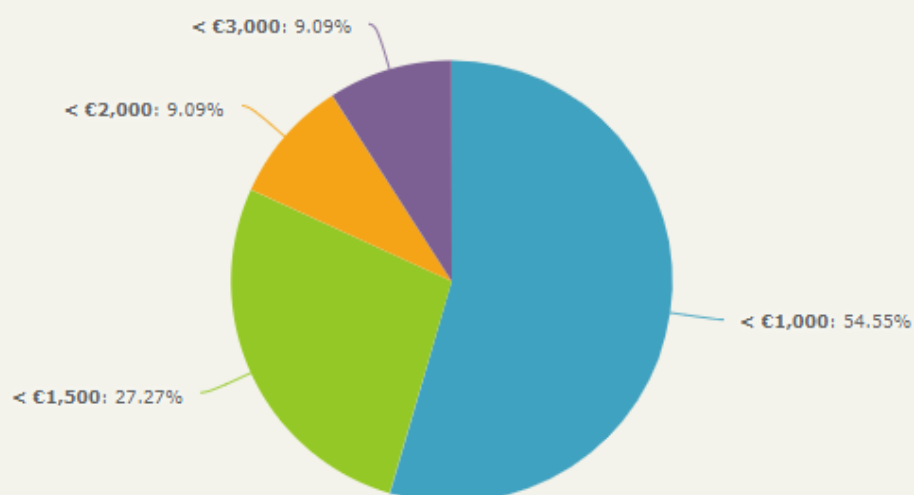
< €1,000: 54.55%

< €1,500: 27.27%

< €1,000	54.55%		6
< €1,500	27.27%		3
< €2,000	9.09%		1
< €3,000	9.09%		1
> €3,000	0.00%		0
		Total Responses	11
		Skipped	8

26. **26. Would you or your institute be interested in future Laboratory Animal Science courses organised by IMR, Nofima, Nancy-Université, WUR and NTNU at the cost indicated by you above?**
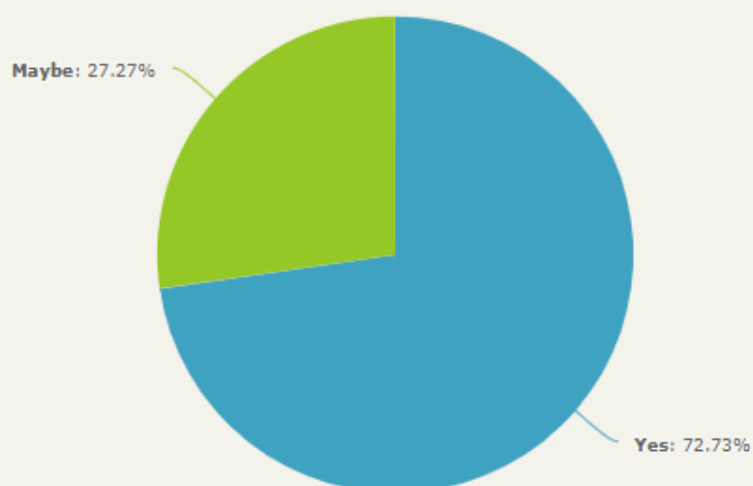
Maybe: 27.27%

Yes: 72.73%

Yes	72.73%		8
No	0.00%		0
Maybe	27.27%		3
		Total Responses	11
		Skipped	8

27. **27. Do you have any other suggestions or feedback?**

Count	Response
1	Not cover so many topics and concentrate on the most important.

Total Responses	1
Skipped	18

Annex 8: Certificate of Participation

AQUAEXCEL²⁰²⁰ – Training Course

CERTIFICATE OF PARTICIPATION

This certificate confirms that the following candidate participated in the
AQUAEXCEL²⁰²⁰ Training Course

"LABORATORY ANIMAL SCIENCE FOR AQUATIC RESEARCH FACILITIES"

provided by the Institute of Marine Research (IMR), with the assistance and
expertise of Nofima, Universite de Lorraine (UL), Wageningen University &
Research (WUR), Norwegian University of Science and Technology (NTNU) and
the Norwegian Food Safety Agency (NFSA)

17-21 June 2019

NAME

*This Training Course was held as part of the AQUAEXCEL²⁰²⁰ project funded by the EU Horizon
2020 research and innovation programme under grant agreement no 652831.*
http://www.aquaexcel2020.eu

Training Course Details

- The objectives of this course were to give participants an insight into the current European legislation around animal science in research and the ethical requirements to be considered when working with animals in aquatic research facilities, focusing on ways to reduce, refine and replace fish in experiments.
- The course contained training on ethics, welfare, rearing and transfer and sampling routines.
- A half day industry mini seminar on laboratory animals for aquatic research facilities gave the course participants an opportunity to exchange with industry professionals.
- The 5 day-course was taught by 17 tutors who are all experts in their field.

Tom Hansen,
Institute of Marine Research (IMR)

Annex 9: Check list

Deliverable Check list (to be checked by the "Deliverable leader")

	Check list		Comments
BEFORE	I have checked the due date and have planned completion in due time		*Please inform Management Team of any foreseen delays*
	The title corresponds to the title in the DOW		*If not please inform the Management Team with justification*
	The dissemination level corresponds to that indicated in the DOW		
	The contributors (authors) correspond to those indicated in the DOW		
	The Table of Contents has been validated with the Activity Leader		*Please validate the Table of Content with your Activity Leader before drafting the deliverable*
	I am using the AQUAEXCEL^{2020} deliverable template (title page, styles etc)		*Available in "Useful Documents" on the collaborative workspace*
	The draft is ready		
AFTER	I have written a good summary at the beginning of the Deliverable		*A 1-2 pages maximum summary is mandatory (not formal but really informative on the content of the Deliverable)*
	The deliverable has been reviewed by all contributors (authors)		*Make sure all contributors have reviewed and approved the final version of the deliverable. You should leave sufficient time for this validation.*
	I have done a spell check and had the English verified		
	I have sent the final version to the WP Leader, to the 2nd Reviewer and to the Project coordinator (cc to the project manager) for approval		*Send the final draft to your WPLeader, the 2nd Reviewer and the coordinator with cc to the project manager on the 1st day of the due month and leave 2 weeks for feedback. Inform the reviewers of the changes (if any) you have made to address their comments. Once validated by the 2 reviewers and the coordinator, send the final version to the Project Manager who will then submit it to the EC.*