World Organisation for Animal Health

Ole Bendik Dale - - NORWAY

WOAH Reference Laboratory Reports Activities 2025

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LABORATORY INFORMATION

***Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:**	Infectious salmon anaemia
***Address of laboratory:**	Elizabeth Stephansens vei 1, 1433 Ås , Norway
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***E-mail address:**	ole.b.dale@vetinst.no
Website:	https://www.vetinst.no/en
***Name (including Title) of Head of Laboratory (Responsible Official):**	Dr Gun Peggy Strømstad Knudsen, CEO
***Name (including Title and Position) of WOAH Reference Expert:**	DVM PhD Ole Bendik Dale, Senior researcher
***Which of the following defines your laboratory? Check all that apply:**	Governmental Research agency

TOR1: DIAGNOSTIC METHODS

1. Did your laboratory perform diagnostic tests for the specified disease/topic for purposes such as disease diagnosis, screening of animals for export, surveillance, etc.? (Not for quality control, proficiency testing or staff training)

Yes

Diagnostic Test	Indicated in WOAH Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
Histopathology	Yes	146	0
Direct diagnostic tests		Nationally	Internationally
Immunohistochemistry	Yes	248	0
Real-time RT-PCR	Yes	903	0
Cell culture with IFAT	Yes	42	0
Sanger sequencing - genotyping	Yes	107	0

TOR2: REFERENCE MATERIAL

2. Did your laboratory produce or supply imported standard reference reagents officially recognised by WOAH?

No

3. Did your laboratory supply standard reference reagents (nonWOAH-approved) and/or other diagnostic reagents to WOAH Members?

No

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAH Members?

TOR3: NEW PROCEDURES

6. Did your laboratory develop new diagnostic methods for the designated pathogen or disease?

No

7. Did your laboratory validate diagnostic methods according to WOAH Standards for the designated pathogen or disease?

No

8. Did your laboratory develop new vaccines for the designated pathogen or disease?

9. Did your laboratory validate vaccines according to WOAH Standards for the designated pathogen or disease?

TOR4: DIAGNOSTIC TESTING FACILITIES

10. Did your laboratory carry out diagnostic testing for other WOAH Members?

No

11. Did your laboratory provide expert advice in technical consultancies on the request of an WOAH Member?

No

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOAH Members other than the own?

No

13. In exercising your activities, have you identified any regulatory research needs* relevant for WOAH?

Yes

Research need : 1

Please type the Research need: Validation of diagnostic tests to levels above 1, applies to all methods in use, and amplicon sequencing (whole genome sequencing) in particular

Relevance for WOAH Capacity Building, Standard Setting,

Relevance for the Code or Manual Manual,

Field Epidemiology and Surveillance, Diagnostics,

Animal Category Aquatic,

Disease:

Infection with infectious salmon anaemia virus

Kind of disease (Zoonosis, Transboundary diseases)

If any, please specify relevance for Codes or Manual, chapter and title

(e.g. Terrestrial Manual Chapter 2.3.5 - Minimum requirements for aseptic production in vaccine manufacture)

Answer: Aquatic manual chapter 2.3.4 Infection with HRP-deleted or HPR0 infectious salmon anaemia virus

Notes:

Answer: Validation of the applied diagnostic tests for ISA are limited to level 1, and by combining tests this is usually considered adequate for case (outbreak confirmation), while for surveillance programs a higher level of validation is beneficial. ISAV viruses vary with regard to virulence and it is challenging to characterise infections discovered in the absence of overt disease e.g. during surveillance. Amplicon sequencing (whole genome sequencing) as published by NVI last year and in-house validated (level 1) will enhance characterisation of any ISAV found, but there is a need for validating this, and other diagnostic test, to higher levels.

TOR6: EPIZOOLOGICAL DATA

14. Did your Laboratory collect epidemiological data relevant to international disease control?

No

15. Did your laboratory disseminate epidemiological data that had been processed and analysed?

No

16. What method of dissemination of information is most often used by your laboratory? (Indicate in the appropriate box the number by category and list the details in the box)

a) Articles published in peer-reviewed journals:

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Grimholt U, Sindre H, Sundaram AYM. ISGylation and E3 ubiquitin ligases: an Atlantic salmon genetic perspective. Front Immunol. 2025 Jun 24;16:1554680. doi: 10.3389/fimmu.2025.1554680. PMID: 40630959; PMCID: PMC12234341.
Benedicenti O, Dahle MK, Makvandi-Nejad S, Andresen AMS, Moldal T, Sindre H, Fosse JH. The Atlantic salmon gill transcriptional response to natural infection with HPR0-ISAV (Isavirus salaris) in three Norwegian smolt farms. Fish Shellfish Immunol. 2025 Feb;157:110096. doi: 10.1016/j.fsi.2024.110096. Epub 2024 Dec 24. PMID: 39724996.

Andresen AMS, Taylor RS, Furniss JJ, Saghafian M, Kuiper RV, Macqueen DJ, Fosse JH. Virus-inclusive single nucleus RNA-sequencing reveals two distinct endothelial response patterns in infectious salmon anaemia. Fish Shellfish Immunol. 2026 Jan;168:110914. doi: 10.1016/j.fsi.2025.110914. Epub 2025 Oct 9. PMID: 41067591.

b) International conferences:

c) National conferences:

d) Other (Provide website address or link to appropriate information):

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOAH Members?

No

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
ISO 17025	AKKREDITERINGSDOKUMENT TEST 110 https://www.akkreditert.no/akkrediterte-organisasjoner/akkrediteringsomfang/?AkkId=222	Akkrediteringsdokument 13.01.23.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Flexible accreditation for real-time RT-PCR methods including ME07_181: ISAV matrix real time RT-PCR	Norwegian Accreditation, member of EA

20. Does your laboratory maintain a "biorisk management system" for the pathogen and the disease concerned?

Yes

The QA system approved by Norwegian accreditation includes a bioriskmanagement system protecting staff and environment through biosecurity measures up to BSL-3 level

TOR9: SCIENTIFIC MEETINGS

21. Did your laboratory organise scientific meetings related to the pathogen in question on behalf of WOAH?

No

22. Did your laboratory participate in scientific meetings related to the pathogen in question on behalf of WOAH?

No

TOR10: NETWORK WITH WOAH REFERENCE LABORATORIES

23. Did your laboratory exchange information with other WOAH Reference Laboratories designated for the same pathogen or disease?

No

24. Are you a member of a network of WOAH Reference Laboratories designated for the same pathogen?

No

25. Did you organise or participate in inter-laboratory proficiency tests with WOAH Reference Laboratories designated for the same pathogen during the past 2 years?

No

Not done

26. Did your laboratory collaborate with other WOAH Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?

No

TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING

27. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than WOAH Reference Laboratories for the same pathogen during the past 2 years?

Yes

Purpose for inter-laboratory test comparisons1	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Name of the test	WOAH Member Countries
The EU-RL Annual Interlaboratory Proficiency Test	Participant - EU countries	11	The EU-RL Annual Interlaboratory Proficiency Test	DENMARK,

TOR12: EXPERT CONSULTANTS

28. Did your laboratory place expert consultants at the disposal of WOAH?

No

29. Additional comments regarding your report:

Yes

ISA is foremost a challenge in th Atlantic salmon industry of Norway