




Heidi S. Mortensen

CONTACT

 Fiskaaling
Biotechnology
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EDUCATION

2022 - current **Doctoral Student**

Thesis title:

Arteriosclerosis and heart pathology of farmed Atlantic Salmon in the Faroe Islands.

Supervised by:

Prof. Erik Sandblom (Department of Biological and Environmental Sciences, University of Gothenburg, Sweden).

Co-supervised by:

Asoc. Prof. Albin Gräns (Department of Animal Environment and Health, Swedish University of Agriculture Science, Gothenburg, Sweden).

Asoc. Prof. Ida Beitnes Johansen, (Department of Preclinical Science and Pathology, Faculty of Veterinary Medicine, Oslo, Norway).

Dr. Lucas Zena (Department of Animal Environment and Health, Swedish University of Agriculture Science, Gothenburg, Sweden).

Helene Wisløff, Veterinary Pathologist (Pharmaq Analytiq, Oslo, Norway)

Synopsis:

1. Investigate the prevalence and severity of coronary arteriosclerosis in Faroese farmed Atlantic salmon through a comprehensive screening study conducted in all three farming companies in the Faroes Islands.
2. Investigate the connection between coronary arteriosclerosis, cardiac pathology, function and the mortality risk during delousing treatments at a Faroese Atlantic salmon farm.
3. Assess cardiovascular function and whole animal performance of smolts reared under contrasting production regimes (fast versus slow growth rate) through controlled laboratory experiments, in order to understand how these different rearing strategies impacts the development of arteriosclerosis, and effects cardiac health and performance

2009 - 2013 **MASTER OF SCIENCE IN BIOLOGY, THE UNIVERSITY OF THE FAROE ISLANDS:**

Thesis title: The cerebral cortex of the long-finned pilot whale (*Globicephala melas*) – An estimation of volume, cell density and total cell number in the entire cortex, and in the auditory and visual cortices

Supervised by: Dr Bente Pakkenberg (The Research Laboratory for Stereology and Neuroscience, Bispebjerg Hospital, Denmark)

Synopsis: This thesis investigated the neocortex of the long-finned pilot whale (*Globicephala melas*). By using stereological methods (3-dimensional histology), the total number of neurons and glia cells were estimated in the cortex. This study was the first to demonstrate that a dolphin species has more neocortical neurons than any mammal studied to date, including humans.

RESEARCH INTERESTS

My research interest is improving the health and wellbeing of farmed Atlantic salmon, especially large post-smolts. I have been part of a consortium of researchers that aimed to map out today's farming practices in order to give advice regarding the best practices when it comes to rearing large post-smolt Atlantic salmon.

I have also worked on projects that focus on the optimization of water quality in recirculating aquaculture systems (RAS) in order to promote fish health and limit negative physiological effects. Recently I have joined a well-established consortium of researchers from Norway, Sweden and the Faroe Islands for a project called DigiHeart. Up to 20% of farmed salmonids die before reaching slaughter. The cause for this high mortality is unknown, but increasing body of evidence points towards cardiac failure. The aim of DigiHeart is to develop technology and machine learning systems to continuously monitor operational and environmental conditions underlying heart disease and mortality in farmed salmonids. My PhD project is also part of DigiHeart.

RESEARCH EXPERIENCE

2022 - current PHD PROJECT – UNIVERSITY OF GOTHENBURG AND FISKAALING A/S:

Coronary arteriosclerosis is becoming increasingly common and severe in farmed Atlantic salmon (*Salmo Salar*). This condition may reduce blood flow to the heart muscle and consequently make the heart less robust and able to handle stress. It is therefore speculated to be a major underlying cause of the substantial increase in mortality observed in recent years in connection with stressful interventions late in the production cycle, such as delousing. The high mortality during late-stages of production is a challenge experienced globally, which results in high economic losses and causes sustainable and welfare concerns. This PhD project aims to investigate the development and progression of arteriosclerosis, which is still largely lacking, and the potential impact it has on coronary function and consequently the robustness of farmed Atlantic salmon.

2018 - 2022 RESEARCHER, THE DEPARTEMENT OF BIOTECHNOLOGY, FISKAALING A/S:

At Fiskaaling I currently develop and implement research projects, coordinate and perform on-land and at-sea sampling, and provide industrial consultation regarding optimization of water quality in RAS to maximize fish growth and welfare.

I have also collaborated with scientists at the Ecology department at Fiskaaling, since I have a background as an environmental supervisor. E.g., I was the project manager of a project that aimed to develop a benthic macrofauna classification system for the Faroese fjords, to be used by the Environment Agency in their impact assessment analysis.

2010 - 2018 ENVIRONMENTAL SUPERVISOR, AT THE ENVIRONMENTAL AGENCY OF THE FAROE ISLANDS:

I worked as an environmental supervisor, but also participating in different environmental research monitoring projects conducted by the Research Department at the Environmental Agency. E.g., I helped with collecting samples used for the Arctic Monitoring Assessment Program (AMAP) programme, as well as participated in the research projects "The effects of Diflubenzuron used for delousing in aquaculture from 2013-2015", and "The effect of chemical delousing used in aquaculture on lobster fishing". I always felt that the research field was more fulfilling for me, and therefore I decided in 2018 to change my career path.

2006 - 2007 RESEARCH ASSISTANT, THE FAROESE MUSEUM OF NATURAL HISTORY:

I worked as a student assistant at the Faroese Museum of Natural History. My role was to assist in botanical field work by doing data sampling, taxonomic classification and statistical analysis.

COLLABORATIONS

- 2021-2024 "Machine learning applied to predicting and preventing production loss in aquaculture (DigiHeart)"
A collaboration with NMBU, DNV, Nofima and UiO in Norway, and UOG and SLU In Sweden.
NordForsk (NOK 7.947.089).
- 2021-2022 "Kunnskapskartlegging - produksjon av stor Laksesmolt"
A Collaboration with CtrIAQUA.
Fiskeri- og Havbruksnæringens Forskningsfinansiering (NOK 5.187.000).

GRANTS AND PROJECT MANAGEMENT

- 2022 "Arteriosclerosis and heart pathology of farmed Atlantic Salmon in the Faroe Island".
Faroese Research Counsel (DKK 994.411).
Innovation fund Denmark (DKK 1.194.000).
- 2020-2021 "Benthic macrofauna classification system for Faroese fjords".
The Faroese Aquaculture Association and The Environmental Agency of the Faroe Islands (DKK 937.451).
- 2019-2020 "Macrofauna – Faroese baseline".
Faroese Research Counsel (DKK 423.648).
- 2018 "Occurrence of Cryptosporidium and Giardia in sheep and cattle in the Faroe Islands - a potential for parasitic contamination of drinking water reservoirs?" Faroese Research Counsel (DKK 505.777). 2012 Statoil (DKK 20.000). A contribution to my master's thesis.

BOARD WORK

2021 - Board member (employee representative) of P/F Fiskaaling A/S.
2007 - 2014 Board member of the Faroese Biology society, and elected president from 2010-2014

PUBLICATIONS PEER-REVIEWED

Heidi S. Mortensen, Elin Jacobsen, Jelena Kolarevic and Amanda Vang (2022).

Exposing Atlantic Salmon post-smolts to fluctuating sublethal nitrite concentrations in a commercial recirculating aquaculture system (RAS) may have negative consequences. In *Frontiers in Animal Science* 3:886071.

Heidi S. Mortensen, Bente Pakkenberg, Maria Dam, Rune Dietz, Christian Sonne, Bjarni Mikkelsen and Nina Eriksen (2014).

Quantitative relationships in delphinid neocortex. In *Frontiers in Neuroanatomy* 8:132.

Eleanor P. Jones, Jens-Kjeld Jensen, Eyðfinn Magnussen, Noomi Gregersen, Heidi Hansen and Jeremy B. Searle (2011).

A molecular characterization of the charismatic Faroe house mouse, 471-482. In *Biological Journal of the Linnean Society*.

Anna Maria Fossá, Erla Olsen, William Simonsen, Magnus Gaard and Heidi Hansen (2010).

Vegetation transition following drainage in a high-latitude hyper-oceanic ecosystem, 249-256. In *applied Vegetation Science* 13:2.

TECHNICAL REPORTS

Óluva Vang, Heidi S. Mortensen, Jógvan Páll Fjallsbak, Kim Steve Gerlach

Bergkvist and Lucy Robertson. Occurrence of *Cryptosporidium* and *Giardia* in sheep and cattle in the Faroe Islands - A potential for parasitic contamination of drinking water reservoirs? ISBN nr.: 978-99918-3-664-5.

Heidi S. Mortensen, Jacob Carstensen, Birgitta Andreasen, Tróndur T.

Johannesen, Birna V. Trygvadóttir Fjallstein and Gunnvør á Norði. Benthic macrofauna classification system for Faroese fjords. Fiskaaling rit 2021-10. ISBN 978-99918-3-663-8.

Heidi S. Mortensen, Gunnvør á Norði, Birgitta Andreasen and Tróndur T.

Johannesen. Botndjórasamfeløg - Eitt Føroyskt sammetingargrundarlag. English titel: Macrofauna - Faroese baseline. Fiskaaling rit 2020-16.

Heidi S. Mortensen. Botndjórasamfelagið - Dálkingarkeldur og Vistfrøðiligar broytingar.

English titel: Benthic community - Impact assessment monitoring. Frøði, 2, 2020.

Maria Dam, Heidi S. Mortensen and Gunnvør á Norði. Kanningar tongdar at

hummaraveiðu í 2016. English titel: "The effect of chemical delousing used in aquaculture on lobster fishing". Frøði, 2, 2016. ISSN 1395-0045.

Heidi S. Mortensen and Maria Dam. Diflubenzuron used for delousing in the Faroe

Islands in 2013, 2014 and 2015, and its accumulation in the sediment. ISBN:978-99972-50-02-5.