



## ***From Ocean to One health: a collaborative and multisectoral approach against infectious diseases and the antimicrobial resistance in aquaculture***

### ***Description***

The aquaculture industry provides an increasingly important source of protein for human consumption targeting several SDGs including 'eliminating poverty', 'stopping hunger', 'promoting health and wellbeing', 'enhancing economic growth and decent work', 'developing resilient infrastructures, sustainable industrialization and innovation', 'reducing inequality', 'ensuring sustainable consumption and production', and 'conservation and sustainable use of marine resources'.

Globally, Atlantic salmon is one of the most intensely farmed and highly valued fish, with the majority of the world's production taking place in Norway, Chile, the UK and Canada. However, the global salmon sector is increasingly threatened by emerging infectious diseases, which have caused substantial problems and costs for the industry. Pathogens, parasites, and pests (PPPs) are a chronic risk for the sector, and the intensification of production and increased trade and supply chain integration have amplified these risks.

Aquaculture may represent a threat to animal and public health because the high amounts of antibiotics needed to control bacterial infections that could be selecting antibiotic resistant-bacteria and antibiotic resistance genes aggravating the Antimicrobial Resistance (AMR) phenomenon among people, aquatic environments, and other aquatic animals. All aspects are crucial that would require "One Health" (OH) approaches as the concept may be able to manage risks in a cost-effective way with cross-sectoral, coordinated investments in human, environmental, and animal health.

Particularly, OH is an integrated, unifying approach that aims to sustainably balance and optimise the health of people, animals and ecosystems. It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and interdependent.

The approach mobilises multiple sectors, disciplines and communities at varying levels of society to work together to foster well-being and tackle threats to health and ecosystems, while addressing the collective need for clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development. Both PIs have been collaborating in these topics and the proposed workshop is aimed at the development of an OH framework to tackle PPPs and AMR in the salmon industry. The aquaculture sector in Chile has a

key role in the Chilean economy and the country is reaching to be recognized as a worldwide food power. Although the salmon farming industry is restricted to few farms in Sweden, there are pilot initiatives that promote the development of land-based salmon farming to deploy a “circular economy” strategy.

***Expected outcomes***

This workshop will bring together researchers working on a range of strategies to better understand the interactions and feedbacks between salmon farming, PPPs and AMR. The workshop will represent a unique forum, grabbing experts from a variety of disciplines representing the academia, industry, and government, to discuss a broad variety affecting public, environmental, and animal health in Chile and globally. To accomplish this, PIs from the University of Gothenburg and UC will partner to organise and lead wrap-up sessions and the development of working tables to define our communication objectives, decide on the messages, select the channels to use, create a communication plan, and evaluate our communication activities.

***Possible site-visits***

Freshwater salmon facilities and a processing plant in Punta Arenas coordinated with the Magallanes Salmon Farmers' Association (<http://salmonicultoresmagallanes.cl/>).

***Planned activities***

We propose a two-day workshop including field visits to salmon farming activities followed by a series of short presentations. The workshop will encompass general discussions on these topics as well as more focused discussions around particular case examples. We anticipate that our workshop could go in a few, complementary directions in terms of research discussions, approaches, and outreach but ultimately to approximate a comprehensive OH framework for sustainable aquaculture.

In two days (16 hours), we will carry out a problem-solving design workshop to help participants develop a broader system of interaction in solving infectious disease issues in aquaculture, increase exposure to and improve cross-sectoral and interprofessional collaboration on bacterial diseases and AMR. Participants will visit salmon farming facilities to understand the context of infectious diseases, salmon farming activities and AMR. A series of 5-min presentations will be delivered by professionals from the academia, private and public sectors working in different areas of the salmon production. Each speaker will highlight key subjects while also identifying research gaps. We will use a Concept mapping technique to show the relationship of concepts/ideas/facts. Workshop participants will also initiate a synthesis paper to highlight new insights, key challenges, and promising research directions in linking aquaculture and OH.

***Contact details***

Fernando Mardones, Pontificia Universidad Católica de Chile ([femardones@uc.cl](mailto:femardones@uc.cl))  
Edward Moore, Gothenburg University ([erbmoore@ccug.se](mailto:erbmoore@ccug.se))