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Health & Welfare

# Scientists are developing a new ‘groundbreaking’ oral vaccine for sea lice in farmed Atlantic salmon

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**By Responsible Seafood Advocate**

## Using reverse vaccinology and AI, could an oral vaccine tackle sea lice challenges?

A multidisciplinary team of scientists has been awarded £1.5 million (U.S. $1.9 million) to develop an oral vaccine to combat sea lice in farmed Atlantic salmon. The project may be “a pivotal step” towards a sustainable and effective solution to the pervasive challenges posed by sea lice in the aquaculture industry.

Dr. Sean Monaghan of the University of Stirling’s Institute of Aquaculture will be conducting and running the vaccine trials and assessing molecular aspects of the parasite at infectious life stages that could be exploited for vaccination. The trials will take place at the University’s Marine Environmental Research Laboratory (MERL) at Machrihanish near Campbeltown.

“Through testing combinations of immune-relevant sea lice antigens together, this project will enhance the immunological response to this complex disease agent,” said Monaghan.

Sea lice attached to a salmon. Photo by 7Barrym0re, via Wikimedia Commons

Development of a commercial vaccine would provide a practical, safe and eco-friendly approach to tackling the issue while also supporting the goal of the Scottish Government to double the value of Atlantic salmon production between 2016 and 2030. Tests using traditional methods for administering salmon lice vaccines via injection have shown limited success.



As an alternative, a team of internationally renowned experts in the field of ecto-parasitology, molecular biology, bioinformatics, veterinary medicine and fish immunology are developing an oral vaccine that will generate an effective immune response within the skin of the salmon. Funded by the Biotechnology and Biological Sciences Research Council (BBSRC), the project is an interdisciplinary collaboration between the Moredun Research Institute (MRI), the University of Stirling’s Institute of Aquaculture (IoA), Bimeda Animal Health (BAH), which also contributed £150,000 and Vertebrate Antibodies Ltd (VAL) with an Industrial Award Partnership contribution from BAH.

## Chem-free fixes emerging in sea lice saga

Salmon farmers, using emerging technologies, are exploring new methods of sea lice mitigation in an effort to overcome one of the industry’s most persistent problems. New chemical-free innovations show an industry eager to adapt and adopt environmentally safe practices.

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“The development of an innovative salmon louse vaccine represents a ground-breaking approach in the aquaculture industry,” said Dr. Kim Thompson of the Moredun Research Institute, who is leading the project. “By harnessing the power of reverse vaccinology and artificial intelligence, our interdisciplinary team is poised to deliver a practical, safe and environmentally friendly solution for combating the problem of salmon lice.

Thompson said this vaccine, designed to enhance both systemic and mucosal immune responses in Atlantic salmon, could help bolster fish health and welfare but also support the sustainable expansion of the Atlantic salmon industry.

**Read more here (https://www.stir.ac.uk/news/2024/january-2024-news/stirling-expert-to-lead-trials-of-salmon-vaccine-that-could-revolutionise-aquaculture-industry/).**

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