

MEDIA INFORMATION

Leibniz Institute for Farm Animal Biology

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LEIBNIZ INSTITUTE
FOR FARM ANIMAL BIOLOGY

Can Leibniz scientists at FBN help the Norwegian salmon breeders?

[Dummerstorf genome biologists to find genetic solutions to strengthen the immune system in aquaculture farming.](#)

The breeding of the Atlantic salmon, which is popular as a food fish, takes a lot of pressure from the wild population, which is threatened with extinction. Despite continuous improvements in aquaculture techniques in recent decades, infectious diseases still lead to high mortality rates among young salmon after transfer from fresh to sea water. Dummerstorf genome biologists at the Leibniz Institute for Farm Animal Biology (FBN) are now hoping to help decipher the genetic profile of salmon and find biomarkers that are crucial for fish health. The international project "ImCom" under the leadership of the renowned state research institute Nofima (Norwegian Institute of Food, Fisheries and Aquaculture Research/nofima.no/en) has a duration of four years and is supported with one million euros by the Norwegian Research Society. Headquartered in Tromsø (Norway), Nofima is one of the largest institutes for applied research in fisheries, aquaculture and food research in Europe.

The FBN has made a name for itself through its research on Born- trout, pike-perch and Baltic Sea houting. Now the fish geneticists at the FBN Institute of Genomics are breaking new ground with the Atlantic farmed salmon. The Dummerstorf fish geneticist Dr. Alexander Rebl described the problem as follows: "There is still a lack of suitable methods to achieve progress in the health management of farmed salmon. The aim of the ImCom project is therefore to use our know-how to refine the existing tools and develop a new methodology in order to objectively assess and improve the resistance of salmon".

The key lies in the genes

Using state-of-the-art analytical methods, the genome biologists hope to identify informative biomarkers from tissue samples that will make it possible to determine the health of farmed salmon. "With the help of our high-tech gene analyses, we want to contribute to the development of robust breeding lines for animal-friendly and at the same time economically viable husbandry," said Rebl.

The starting point is the approximately 10,000 data sets on gene activity from the project partners in Norway, but also in France, England, Spain and Russia.

"We are convinced that the FBN, with its biotechnological equipment and innovative diagnostic tools, can help us find helpful information on gene activation patterns to strengthen the immune system of farmed salmon and minimize losses," said lead investigator Dr. Aleksei Krasnov of the Norwegian Nofima Research Institute, who recently visited the FBN Institute in Dummerstorf. The first results should be available in two years.

With about 1.2 million tonnes, the Norwegian Kingdom is by far the world's largest producer of salmon in aquaculture, followed by Chile, Scotland, Canada and the USA. In Germany, the predatory fish, which mainly comes from Norway, is also one of the most popular edible fish due to its excellent taste and its health-promoting omega-3 fatty acids. But the ever-increasing demand and environmental and climate changes are also causing problems. The farmed salmon is more susceptible to viruses and bacteria as well as parasites such as the highly feared salmon louse

Although all salmon in Norway are vaccinated against the most common salmon diseases at an early age, the loss resulting from translocation from freshwater to saltwater in the cold fjords of the Norwegian Sea at the age of one to two years is estimated to be in the double-digit million euro range each year. Up to three years elapse before the salmon with a body weight of four to five kilos is sold on the counter and gets to our plate.

Background Atlantic salmon (*Salmo salar*)

The fish of the year 2019 is a migratory fish that needs undeveloped and clean rivers and streams to get from the sea, its main habitat, to its freshwater spawning grounds and successfully reproduce there. Atlantic salmon live mainly in the Atlantic Ocean and grow to 60 to 100 cm in length and weigh three to 15 kg in the wild. Threatened by extinction, wild salmon is on the Red List of Endangered Animals in Germany. In addition, there is the Pacific salmon, a genus of the salmon fish family widespread in the Pacific region.

The Leibniz Association connects 93 independent research institutions that range in focus from the natural, engineering and environmental sciences via economics, spatial and social sciences to the humanities. Leibniz Institutes address issues of social, economic and ecological relevance. They conduct knowledge-driven and applied basic research, maintain scientific infrastructure and provide research-based services.

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They are subject to an independent evaluation procedure that is unparalleled in its transparency. Due to the importance of the institutions for the country as a whole, they are funded jointly by the Federation and the Länder, employing some 19,100 individuals, including 9,900 researchers. The entire budget of all the institutes is approximately 1.9 billion Euros.

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Photo FBN: *Laboratory assistant Luisa Falkenthal (seated) shows cell cultures of farmed salmon that are examined at FBN in high-tech automated equipment. Dr. Aleksei Krasnov (from left), Dr. Alexander Rebl and the Norwegian doctoral student Anne Flore Bakke hope for sustainable solutions to the problems of salmon farming.*

Photo Gerd Meissner/pixabay: *Salmon farming - here a salmon farm in the North Sea - is an important Norwegian sector of industry.*

Photo Danny Moore /pixabay: *Salmon is on almost every menu because it tastes good and is healthy.*

+++**Save the date:** **"Open Day" on Saturday, 21 September 2019** at the Leibniz Institute for Farm Animal Biology (FBN) and at the State Research Centre for Agriculture and Fisheries MV (LFA)

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