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Health test for salmon smolt may improve survival chances

19 September 2022

By Responsible Seafood Advocate

Scientists at food research institute Nofima have developed a test that measures the immune status of salmon smolt.

Salmon that adapt from a life in fresh water to seawater need a robust immune system to make the transition. The test can provide information that benefits fish farmers when transferring salmon to the sea.

“A few years ago, we found that the immune system was weakened during smoltification,” said Aleksei Krasnov, senior scientist at Nofima. “As a result, we decided to develop a test to measure the immune status of salmon during smoltification.”

The diagnostic test measures the activity of 44 genes that are important for the immune system. A sample is taken from the gills or the dorsal fin without harming the fish. The researchers found the normal activity level for each of the 44 genes in a fish of good condition. If the activity level is too high or too low, it may indicate poor immune status. This means that they can now offer tests for immune status in salmon smolt.



Nofima has analyzed large amounts of genetic material in order to build up a database of gene activity, which forms the basis for the test. Photo courtesy of Joe Urrutia © Nofima.

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“We are able to see which fish are in good condition and which are not,” said Krasnov. “In addition, we know which fish seem healthy, but in reality are not.”

The results can help increase the smolts’ chances of survival. Every year, approximately 15 percent of farmed salmon die after being transferred from land-based freshwater tanks to net pens at sea. Most of these fish die shortly after being transferred. Nofima says that this test is “very relevant.”

“The successful development of this novel technique provides companies with a new tool in the smolt quality assessment box, for verifying the immune competency and robustness of smolt before transfer to sea,” said Dr. Gordon Ritchie, co-author of the paper and group manager fish health and welfare in Mowi ASA. “This immune status diagnostic tool can also be utilized in future research projects on smolt performance and survival.”

[Read more about the study here \(https://nofima.com/results/scientists-have-developed-a-health-test-for-smolt\)](https://nofima.com/results/scientists-have-developed-a-health-test-for-smolt).

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Author



RESPONSIBLE SEAFOOD ADVOCATE

editor@globalseafood.org (<mailto:editor@globalseafood.org>).

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