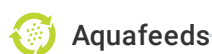




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Aquafeeds

# Nofima trial results support use of insect meal and insect byproducts in aquafeeds

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By Responsible Seafood Advocate

## Researchers evaluate different levels of stickwater, a byproduct of insect meal processing

Researchers at Norway-based Nofima say that recent aquaculture feeding trials show that insect meal and even byproducts from black soldier fly (BSF, *Hermetia illucens*) processing can help fish grow well.

Seeking to measure the effects on salmon parr, which are young, freshwater salmon, the researchers worked with France-based insect producer Innovafeed to feed during the larval stage. At Nofima's Sunndalsøra research station, they measured differences in digestion and growth when using feeds with 10 percent insect meal and various levels of stickwater, a byproduct of insect meal production thought to be rich in bioactive components. BSF larvae are processed into meal and stickwater.

The researchers studied juvenile fish during a growth phase from approximately 20 to 85 grams. The insect ingredient was compared in feed with similar protein content and replaced half of the fish meal in a control diet.

The trials showed that salmon grew just as well and had just as good digestion when their diet



Nofima's recent feeding trials indicate that insect meal and a byproduct of black soldier fly processing can help salmon growth and digestion. Photo by Innovafeed.

contained stickwater. With 10 percent insect meal in the feed, the fish also grew just as well as the fish that received the control feed.

"The trial shows that there is no problem in salmon having at least 10 percent insect meal in their feed. Based on the positive effects of the stickwater fraction from fishmeal, we cannot rule out that this fraction from insects would have had a positive effect under other conditions. In any case, it is an important side stream to safeguard for the optimal utilization of insects as feed for fish," said Nofima's Andre Sture Bogevik.

In the project, the level of the mineral manganese was also investigated. The EU has threshold values for the content of manganese in the finished feed for farmed fish, and insects contain naturally high levels of this. The trial showed that the fish excrete the mineral and do not absorb more in the body than if the meal did not contain high levels of manganese. Nor did the mineral lead to any deformities or have a negative impact on growth. "We are delighted to observe results aligned with the internal research we have carried for the past years at Innovafeed," said Elin Kvamme at Innovafeed.

"The growth results pave the way for the widespread use of insect protein in the salmon industry, as a sustainable, traceable and performing ingredient." The research – conducted as part of the Millennial

Salmon project, which is funded by the Research Council of Norway – is published as the master’s thesis of Erika Marie Hanson at the Norwegian University of Life Sciences (NMBU) and is titled, “Effects on growth and welfare of Atlantic salmon parr fed diets with 10% BSFL meal, with different inclusions of BSFL stickwater.”

**[Read the master’s thesis here. \(https://seafoodinnovation.no/wp-content/uploads/2023/06/Master-oppgave-Erika-BSFL-SW-trial.pdf\)](https://seafoodinnovation.no/wp-content/uploads/2023/06/Master-oppgave-Erika-BSFL-SW-trial.pdf)**

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## Author

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**RESPONSIBLE SEAFOOD ADVOCATE**

[editor@globalseafood.org](mailto:editor@globalseafood.org) (mailto:editor@globalseafood.org)

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