



The all-rounder: Black soldier fly makes sustainable resource cycles possible

An optimal and sustainable food for the black soldier fly is being designed at the Research Institute for Farm Animal Biology (FBN) in Dummerstorf for a model site of the blue bioeconomy

A model site for the blue bioeconomy is being created on Rügen. The “RüBio” project of the “Innovation Space Bioeconomy on Marine Sites” of Christian-Albrechts-Universität zu Kiel brings together six partners from science and industry to make regional resource cycles efficient and tangible. A key element: the black soldier fly, which is being studied at the FBN in Dummerstorf.

Black soldier flies are all-rounders: Their larvae transform almost any food into high-quality protein. This makes them an ideal, nutrient-rich food source. At the Research Institute for Farm Animal Biology (FBN), they are being studied by Prof Cornelia C. Metges and her colleagues Dr Gürbüz Daş and Dr Manfred Mielenz. “The larvae are decidedly versatile in their choice of food, unlike mealworms, for example,” explains Dr Manfred Mielenz. As a processed feed, now also approved for pigs and chickens since last year, the black soldier fly larva offers a resource-saving alternative to imported protein-rich supplementary feed, such as soya. Black soldier flies are an important building block for the “RüBio” project. Prof Cornelia C. Metges and her colleagues have now received project funding from the Federal Ministry of Education and Research (BMBF) for research into sustainable feeding of the larvae on the basis of residual materials.

Traditional dairy becomes model location for regional resource cycles

In the former dairy of the “Rügener Badejunge” in Bergen on the island of Rügen, a unique closed-loop system is now being built in the new “Bioeconomic Research Centre Rügen (BFZR)”. The centrepiece is an aquaculture with edible fish. Their water is purified by means of an algae reactor for the production of algae biomass and used for the irrigation of medicinal herbs and fruit crops. An essential component of the resource cycle will be the black soldier fly facility: The resulting residues and by-products, for example from fruit cultivation, serve as food for the black soldier fly, whose larvae are in turn fed to the food fish. This means that the use of fishmeal in aquaculture can be dispensed with. The model site “Bioeconomic Research Centre Rügen” will later also make science tangible for visitors.



Feed design for the black soldier fly at the FBN

What exactly the larvae of the black soldier fly need to produce as much high-quality protein as possible is now being researched on a laboratory scale at the FBN's black soldier fly facility as part of the "RüBio" project. In order to produce in a resource-saving and sustainable manner, only organic residues or by-products from the plant itself and the region, such as fruit residues, hay residues, leftovers from the bakery or brewery, are to be taken.

"We analyse a wide variety of residues and find out how they need to be combined so that their nutrients can be optimally used for the growth of the protein-rich larvae," explains Dr Gürbüz Daş. But the climate-friendliness of the various combinations of residues is also tested in the respiration chambers for black soldier flies at the FBN. "Depending on the composition of the feed, different amounts of climate-relevant gases are released," Dr Manfred Mielenz elaborates. The results of the experiments are then implemented in the new insect facility at the "BFZR", with researchers from the FBN providing advice.

The model site on Rügen is to be established by 2024. The production of high-quality cosmetics is also being considered there - the oil of the black soldier fly larva is very similar to that of palm kernel oil and coconut oil, but much more climate-friendly. A real all-rounder.

Photos

Photo 01: FBN/Nordlicht

Since 2019, a team of scientists at the FBN has been researching the black soldier fly as an alternative high-quality source of protein.

Photo 02: FBN/Nordlicht

Prof Cornelia C. Metges and Dr Manfred Mielenz in front of their fly colony at the FBN.

Photo 03: FBN/Haberkorn

Dr Gürbüz Daş with the protein-rich larvae of soldier flies. This will be feed for fish in aquaculture in the future.

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