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 Aquafeeds

## NovoNutrients partners up on its pathway to commercialization

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By James Wright

**Silicon Valley biotechnology company selected as a FEED-X innovator, while its roster of big-name collaborations expands**



The NovoNutrients Protein made in an industrial biotechnology process will be tested in the R&D labs of Skretting, one of the world's largest aquafeed manufacturers. Courtesy photo.

Producers of novel feed ingredients for the aquaculture industry – think microalgae, insect larvae and single-cell proteins – have a lot of questions to answer. Two big ones are whether their production systems can reach commercial scale, and whether the end product is price-competitive with existing ingredients.

Their pathway to commercialization begins with innovation. Silicon Valley (California, USA) biotechnology company **NovoNutrients** (<https://www.novonutrients.com>), has demonstrated its ability to utilize industrial waste streams that would otherwise cause harm to the environment to create a microbial biomass via industrial fermentation.

**"A new nutrient for aquaculture, from microbes that consume carbon waste" ([https://www.aquaculturealliance.org/advocate/new-nutrient-aquaculture-microbes-eat-carbon-waste/?\\_hstc=236403678.a454308975c360199c3dd8eab22c8a9c.1682454881556.1682454881556.1682454881556.1&\\_hssc=236403678.1.1682454881556&\\_h](https://www.aquaculturealliance.org/advocate/new-nutrient-aquaculture-microbes-eat-carbon-waste/?_hstc=236403678.a454308975c360199c3dd8eab22c8a9c.1682454881556.1682454881556.1682454881556.1&_hssc=236403678.1.1682454881556&_h))**

The subsequent step is collaboration, which for NovoNutrients is happening on multiple fronts. Chris Oakes, VP of market and product development, told the *Advocate* that newly formed collaborations with multinational energy corporation Chevron and with Skretting, one of the world's largest animal feed producers, have created an "exciting exposure moment" for the company.

But they're not done, as this week the company will announce that it has been selected to join FEED-X, a **Project X Global** (<https://projectxglobal.com/about/>), accelerator project founded in partnership with the World Wide Fund for Nature (WWF). FEED-X is one of several initiatives intended to transform the "sustainability performance" of industry value chains linked to climate change and declines in biodiversity. The program aims to get 10 percent of global industry to procure alternative solutions for raw materials at scale.

"Raw materials are going to be the story, in relation to climate change and what happens with the future of the planet," Oakes said. "Single-cell proteins have durability and stability, in a world where who knows how farming has to change."

Only a handful of the 10 or so companies chosen for FEED-X have been officially named. **Veramaris** (<https://www.veramaris.com/home.html>), a Netherlands-based joint venture from DSM and Evonik that produces omega-3 fatty acid-rich algal oil produced in Slovakia and the United States, is one and **UniBio** (<https://www.unibio.dk>), a microbial protein methane fermentation company based in Denmark, is another. Other yet-to-be-named companies include producers of mealworms and black soldier flies, both of which "upcycle" nutrients from agriculture waste and byproducts.

Flying a bit under the radar, NovoNutrients is gaining wider recognition in the wide-open field of alternative aquafeed ingredients as aquaculture and agriculture seek to adopt more sustainable practices. It now has a "real world oil and gas collaborator" in Chevron, which Oakes said is allowing the company to prove its ability to utilize industrial carbon emissions; its collaboration with Skretting, announced in September and which will test the NovoNutrients Protein in its R&D labs, will smooth and shorten the path to large-scale manufacturing and adoption, according to its CTO, Brian Sefton.

"[The collaborations] mean we are on the right track, with the right products for the right industries," said Oakes. "It's validation of the emerging clean energy and hydrogen economies; it's validation of the carbon economy; and it's validation of aquaculture! Players who never knew what aquaculture meant are now thinking about the fish feed conundrum."

NovoNutrients' gas fermentation process blends two massive-scale feedstocks: carbon dioxide and hydrogen. Carbon dioxide is utilized from untreated waste emissions from cement plants, ethanol factories, pulp and paper refineries and other industrial sources. The two gases grow the fast-doubling bacteria strains, which the company calls a "microbial consortium," and after fermentation the end result is a product that is 70 percent protein that can feed fish, pets and even people.

While it remains a pre-sales, venture-funded company, Oakes predicts 2021 will be a "breakout year" for NovoNutrients.

"We've demonstrated good traction, have good commercial collaborations up and down the value chain. Now it's time to show that we're a player and that this technology is scaling as part of this new paradigm," he said. "If the world really invests in sustainable technology and the circular economy, this is the opportunity to establish the right beachheads in a global way with production and strategic partnerships. It's industrial biotech, though, so it can't be just deployed like software – at least not quite yet."

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Bill Coleman, VP-biology, and CTO Brian Sefton are pictured at NovoNutrients' R&D facility in California, USA. Courtesy photo.



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