Protein production serves aims for sustainability in our food future

July 9 2019, by Nancy Cohen

Credit: CC0 Public Domain

Food out of thin air. As a company slogan, it is hard to get more catchy than that. What on food-producing earth do they mean?

It's about a method to produce protein from air with electricity. Pilot equipment for protein production has even been set up in Lappeenranta, Finland.

They mean a fermentation process. Solar Foods is the company behind a natural food protein source you probably never heard about called Solein.

The launchpad is Finland but the inspiration comes from a concept by NASA. Researchers took up the concept and developed it in projects involving VTT Technical Research Center of Finland and the Lappeenranta University of Technology. The company was assisted by research from the VTT and the Lappeenranta University of Technology.

LUT and VTT verified the possibility to produce single-cell protein with electricity and carbon dioxide in 2017 in their joint research project, Neo-Carbon Energy. In 2018, the ESA Business Incubation Center in Finland asked Solar Foods to submit a proposal for food production which could serve as a system for producing natural proteins in space flights to Mars.

How it works: single-cell proteins of Solein are produced from CO_2, water, and electricity. Augusta Pownall in *Dezeen* said, "Solein is made by applying electricity to water to release bubbles of carbon dioxide and hydrogen. Living microbes are added to the liquid—these create protein that is then dried to form a protein-rich powder."

All in all, it is a model similar to the fermentation process that goes into making beer. Similar to—but with an interesting difference. *Fast Company*'s Adele Peters: "Food made through fermentation, like beer or lab-grown meat, currently relies on feeding plant sugars to microbes. The new process replaces those sugars with carbon."

Advantages: It is not influenced by usual agriculture methods. And when it avoids the usual trappings of agriculture, that means avoiding what Peters referred to as "the massive environmental footprint of agriculture—which comprises everything from land and water use to the

emissions from fertilizing crops or raising animals."

Jero Ahola, Professor of Energy Efficiency in Electrically Driven Systems at LUT, said, "Tackling sustainability issues requires new solutions in all sectors of society. Transport and industry are further along in their P2X processes, but there is an equal need for emission-free solutions in food production. The process we have developed is one response to this."

The powder could serve in the desert, arctic or in space. The Solein powder can be an ingredient in regular foodstuffs, such as yoghurts, shakes, bread and pasta, said *Dezeen.*

Bottom line: Does it taste good? The company said it looks and tastes like wheat flour. It is 50% protein, 20–25 % carbs, and 5–10 % fat.

What's next? *Fast Company* said Solar Foods want to bring their food to grocery stores as an alternative protein, in the next couple of years.

The company is to apply for a food license from the EU later this year and plans to begin commercial production in 2021, said Pownall.

What will it look like on the store shelves? Packets of powder? Bigger bags of powder? According to Peters, "When it starts showing up in grocery stores—within the next two years, if all goes according to plan—it won't be in its powder form but as an ingredient in products like protein shakes, perhaps, or plant-based yogurt."

Daniel Boffey, *The Guardian*, wrote, "The powder known as Solein can be given texture through 3-D printing, or added to dishes and food products as an ingredient." More on this: Boffey quoted Dr. Pasi Vainikka, the chief executive of the tech startup who said the powder could be an "ingredient like any ingredient in the food" or it would be

possible to "make the powder into fibres that resemble meat or bread."

Pownall, *Dezeen*, said that "The company plans to produce enough powder to make two billion meals a year by 2022."

(The first factory producing Solein is scheduled to open at the end of 2021, producing 50 million meals per year, scaling up to two billion meals by the end of the following year, said Pownall.)

More information: solarfoods.fi/

Citation: Protein production serves aims for sustainability in our food future (2019, July 9) retrieved 26 April 2024 from
https://techxplore.com/news/2019-07-protein-production-aims-sustainability-food.html