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Solar Foods confirms successful 100-fold industrial scaling of Solein's production technology

The production parameters achieved at Solar Foods' pilot facility have now been verified on an industrial scale at the company's first commercial-scale production facility, Factory 01. With the production parameters now achieved, the company's next production facility, Factory 02, which is in the pre-engineering phase, would be profitable. The successful scaling of production enables the commercialisation of Solein® in the United States.

Solar Foods' first commercial-scale Solein production facility, Factory 01, started operations in April 2024. One of the key aims of the facility was to verify the scalability of the company's technology on an industrial scale. At Factory 01, the production technology was scaled up a hundredfold compared to the pilot facility's production scale. Before the maintenance break started in May, Factory 01 produced Solein continuously for 8 months.

The production parameters reached at Factory 01 are a key achievement when the company is preparing the investment decision for Factory 02, which is now in the pre-engineering phase. With the production parameters now achieved at Factory 01, Factory 02 would be profitable.

"Factory 01 is a one-of-a-kind production facility unlike anything ever built before. Successfully scaling up production is a significant milestone in the development of our technology and the commercialisation of Solein. We have demonstrated that the results achieved in our pilot facility are replicable and can also be scaled up to an industrial scale," says **Petri Tervasmäki**, Chief Technology Officer at Solar Foods.

Solein is a previously unknown microorganism found by Solar Foods in the Finnish nature. Solein is produced using gas fermentation technology, the main raw materials of which are carbon dioxide and hydrogen produced using renewable energy. The continuous production process is developed and patented by Solar Foods. The company carries out all stages of the production process itself in the same facility and is not dependent on individual external parties. This technology enables food production anywhere in the world, as production is not dependent on weather, climate conditions, or land use.

The most important stage of the production process is continuous cultivation, in which the microbe grows in a 20,000-liter bioreactor. Factory 01 has now achieved a productivity of 0.8 g/l/h and an energy efficiency value (O2/CO2) of 2.7. Solar Foods will continue developing the productivity and energy efficiency and has already achieved a productivity of 1.6 g/l/h and an energy efficiency value (O2/CO2) of 2.6 at its pilot facility. The company aims to bring the parameters achieved on a pilot scale to the Factory 01 scale, as improving efficiency significantly lowers the production

cost of Solein. After the maintenance break, the company will continue to increase efficiency further to reach an annual capacity of 160 tons by the end of 2025.

Production parameter development

	Productivity g/l/h	Energy efficiency $_{O2/CO2}$
Pilot facility (2022–2023)	0.5 - 1.0	2.8 - 3.5
Pilot facility (2024–2025)	1.0 - 1.6	2.6 – 3.0
Factory 01 (H1 2025)	0.8	2.7

Successful scaling of production enables commercial growth

The successful start-up and ramp-up of production at Factory 01 has enabled the commercialisation of Solein. Solar Foods has been able to produce Solein for commercial purposes and to store and deliver the ingredient to its customers in the United States. At the same time, the company has developed Solein's properties to better meet customer needs, and the shelf life of the ingredient has been verified to have increased from one year to two years. The company has also developed product applications and concepts that showcase Solein's suitability and applications in various consumer products.

During this year, Solar Foods has announced its first supply agreements for Solein, as well as a Memorandum of Understanding with two international customers for commercialisation plan of altogether 6,000 tonnes of Solein per year. If the collaboration leads to binding agreements, the total volume commitment of 6,000 tons would correspond to approximately 50% of the total capacity of Factory 02.

"We were able to start commercialisation activities for Solein in the United States at the very end of last year. We have already had numerous conversations with different customers and have also grown our sales organisation. The feedback from customers has been bewilderingly positive: Solein receives constant praise for its excellent nutritional values, great taste and functionality. Product concepts allow us to better demonstrate how Solein works in finished consumer products and to better meet market needs," says **Juan Manuel Benitez-Garcia**, Chief Sales Officer at Solar Foods.

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About Solein®
Solein is an all-purpose protein grown with the air we breathe: The unique bioprocess takes a single microbe, one of the billion different ones found in nature, and grows it by fermenting

it using air and electricity and thereby converting carbon dioxide to protein. Solein is a nutritionally rich and versatile ingredient which can replace protein virtually in any food. Solein can also be used as a fortifier to complement the nutritional profile of various foods: it can be a source of iron, fiber and B vitamins, and it can also bring different techno-functionalities into food products. www.solein.com.

About Solar Foods

Solar Foods produces Solein®, a protein created using carbon dioxide and electricity. This innovative production method is independent of weather and climate conditions, eliminating the need for traditional agriculture. Founded in Finland in 2017, Solar Foods is listed on the Nasdaq First North Growth Market Finland. Learn more at www.solarfoods.com and investors.solarfoods.com.

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