

INDOOR FARMING

Berlin's Factory-Made Vegetables

In a former factory in Berlin's gritty Kreuzberg district, the small firm Infarm is part of an agricultural revolution using LED lighting to farm indoors.

BY MARIUS MÜNSTERMANN



Will the salad of the future grow indoors? Source: Marius Münstermann

The future of the world's urban food supply can be found in a courtyard in the heart of Berlin.

Three young entrepreneurs are growing vegetables without soil and sunlight, in the middle of the capital city, despite the fact the gritty Kreuzberg district isn't the most obvious place to launch a career in farming.

"We wanted to grow our own food," said Guy Galonska. "But we didn't want to move to the countryside, we wanted to stay in the big city."

Together with his brother Erez Galonska and his wife Osnat Michaeli, he founded the firm Infarm.

WHY IT MATTERS

Growing crops indoors opens new opportunities for fresh and regional produce.

FACTS

Indoor farming companies in both Japan and the United States are already challenging conventional farmers.

Plants under LED lights grow twice as fast as outdoor crops.

But their flavor is blander than those of field-raised plants.

The plants are bedded in hemp fibers and their roots dip down into a water trough below, in a closed system which uses 90 percent less water than conventional agriculture.

“We don’t need pesticides, because our plants grow indoors,” said Mr. Galonska, looking across the greenery sprouting across what used to be a factory building.

“Most fungus and insects are in the ground; since we don’t use any soil and we work in sealed rooms, we haven’t had any problems with pests so far.”

The trouble is, little sunlight comes in either. Infarm uses LED lights from Valota, a high-tech manufacturer from Finland, to keep the plants photosynthesizing. The rest of the farm’s equipment can be found at a typical hardware store.

The biggest problem so far has been the high electricity consumption, even though LEDs are considerably more efficient than conventional lighting.

For indoor farms, one solution could be to grow plants in the glass facades of high-rise buildings. The plants would provide shade for the building and spaces which otherwise would be barren could be used to produce food.

Indoor farms in both Japan and the United States are already challenging conventional farmers. “But in Germany, research is only just getting started,” said Matthias Arlt from the Max Planck Institute for Molecular Plant Physiology. “Agricultural yields here are very high so it’s not clear whether indoor farming can compete with them.”

An estimated 80 percent of the world’s population will live in cities by 2050 - a figure which encourages the city farmers. “Indoor farming has enormous potential in megacities,” said Mr. Arlt.

Unfortunately, indoor crops still lack flavor compared to produce which is grown outdoors. “It’s impossible to match the taste of vegetables from the field. We already know that from tomatoes which are grown in Dutch greenhouses,” he said.

But plants under LED lights grow twice as fast as outdoor crops. And there are other benefits. “Depending on how we adjust the wavelength of the light, we can influence how the vegetables taste,” said Mr. Galonska.

“Infarm intends to harvest 80 to 100 heads of lettuce each day from just 25 square meters of space year round.”

He and his brother did their preliminary testing for Infarm in their parents' living room in Tel Aviv. They were so impressed by the results

that Guy quit studying Chinese medicine, and Erez and his wife gave up their careers as filmmakers. They even see their inexperience with agriculture as an advantage.

“Some say we don't have any biological or technical knowhow. Maybe that was true at the beginning. But we always have an open vision and we aren't confined by following one single discipline,” Mr. Galonska said.

His futuristic greenhouse in Berlin shows how deeply he has explored his subject, and he talks about it nonstop while plucking a few leaves of cress, peering into the water trough, and mixing a drink at the bar using herbs he has grown.

Awareness of Infarm's concept is spreading. The start-up was initially financed by crowdfunding and the group quickly found an investor. Now they are on the verge of delivering produce to Berlin's hip new 25hours hotel. Other hotels and restaurants are meant to follow. Supermarkets have also shown interest in the futuristic vegetables. And starting at the end of November, customers can order Infarm's products both online and at the factory.

Until then, the entrepreneurs gather each Saturday for brunch at their indoor greenhouse, which they call “a combination between a laboratory and a restaurant.”

Guests sit in the violet glow of LEDs at a rustic table, where the two Galonska brothers and Ms. Michaeli chat about the pH values of water or their business plans. On average they spend 10 hours a day sitting in the greenery.

Infarm currently has eight employees, most working in the kitchen. Many of the ingredients are from their own harvest and the rest comes from the market - for now. The urban farmers are already planning to grow rice and soy under the LEDs. But Mr. Arlt remains skeptical.

“It will still only be possible to grow large quantities of crops in fields for the foreseeable future,” he said.

That isn't stopping Infarm's founders from looking to increase yields through vertical farming, that is, by stacking rows of plants on top of each other. They intend to harvest 80 to 100 heads of lettuce each day

from just 25 square meters of space - throughout the entire year. Eventually they hope to have machines do the harvesting. It's all very ambitious, but Mr. Galonska is a believer.

"Indoor farming is the future of urban food supply," he said.

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