

Japanese taste future where lettuces are grown by robots

Japan

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They look like workers at a nuclear power plant, in masks, hoods and white body suits. They scrub their hands like surgeons going into the operating theatre.

The temperature and humidity in their workspace is controlled and sealed off from the outside world by double doors. Yet the delicate items inside are not radioactive cores or beating hearts but lettuces: 882,000 of them, from seedlings to mature plants, the most technologically advanced salad ingredients ever grown.

This is Spread, a factory farm in Kameoka, near the Japanese city of Kyoto, the most intensive lettuce producer in the world. About 21,000 of them are harvested every day, from a space no bigger than a medium-sized factory.

Having eliminated weather and pests, the factory can send out 97 per cent of its produce. The lettuces are stacked on four storeys each with four shelves — the one-acre site has more than six acres of lettuces.

Their roots grip not soil but plastic sponges full of nutrient-enhanced water. Their leaves grow under fluorescent tubes. They taste like

every other lettuce you have eaten, cost the same and they are sold in 2,100 outlets across Japan, including restaurants in Tokyo Disneyland.

This is the brave new world of mass production agriculture — an insight into how more of our food will be grown and produced in the decades to come. And soon robots will take over the more mundane tasks.

The need is particularly acute in Asia, which contains more than half the world's population but has only a fifth of its agricultural land. As the vast populations of China and India grow ever bigger, fields become over-farmed and water supplies stretched.

In Japan, the problems are different — agricultural land is running wild because elderly farmers are unable to persuade their children to take on the hardship of agricultural life. Hence the appeal of a factory farm, where manager and workers can clock in and out.

"It's resistant to climate change," Shinji Inada, Spread's founder, said. "Provided you have electricity and water, you can replicate it anywhere in the world. And it's friendly to the environment."

As the white suits and gloves suggest, there are practical challen-

ges in growing such vegetables. Extreme precautions are taken to exclude disease and pests, which would spread rapidly through the factory. To maintain the pace of production, temperature and humidity have to be kept steady — not easy in a country where the temperature ranges from 40C in summer to freezing in winter.

Then there is the psychological barrier of persuading consumers to buy a lettuce that has never touched the soil. Mr Inada tried to emphasise the hygiene advantages. His lettuces are grown without pesticides.

But the breakthrough, he says, was the disaster at the Fukushima Dai-ichi nuclear power plant in 2011, which spread radiation over some of the richest farmland in the country. At a stroke, the idea of food grown inside became attractive. In 2014, after eight years, Spread turned a profit.

Soon it will cut out a further unreliable element — humans. Next year Mr Inada plans to open a factory that will produce 30,000 lettuces a day. Payroll costs will be halved by eliminating the workers. Human hands will still be needed for the delicate task of planting the seeds but everything else will be done by robots.