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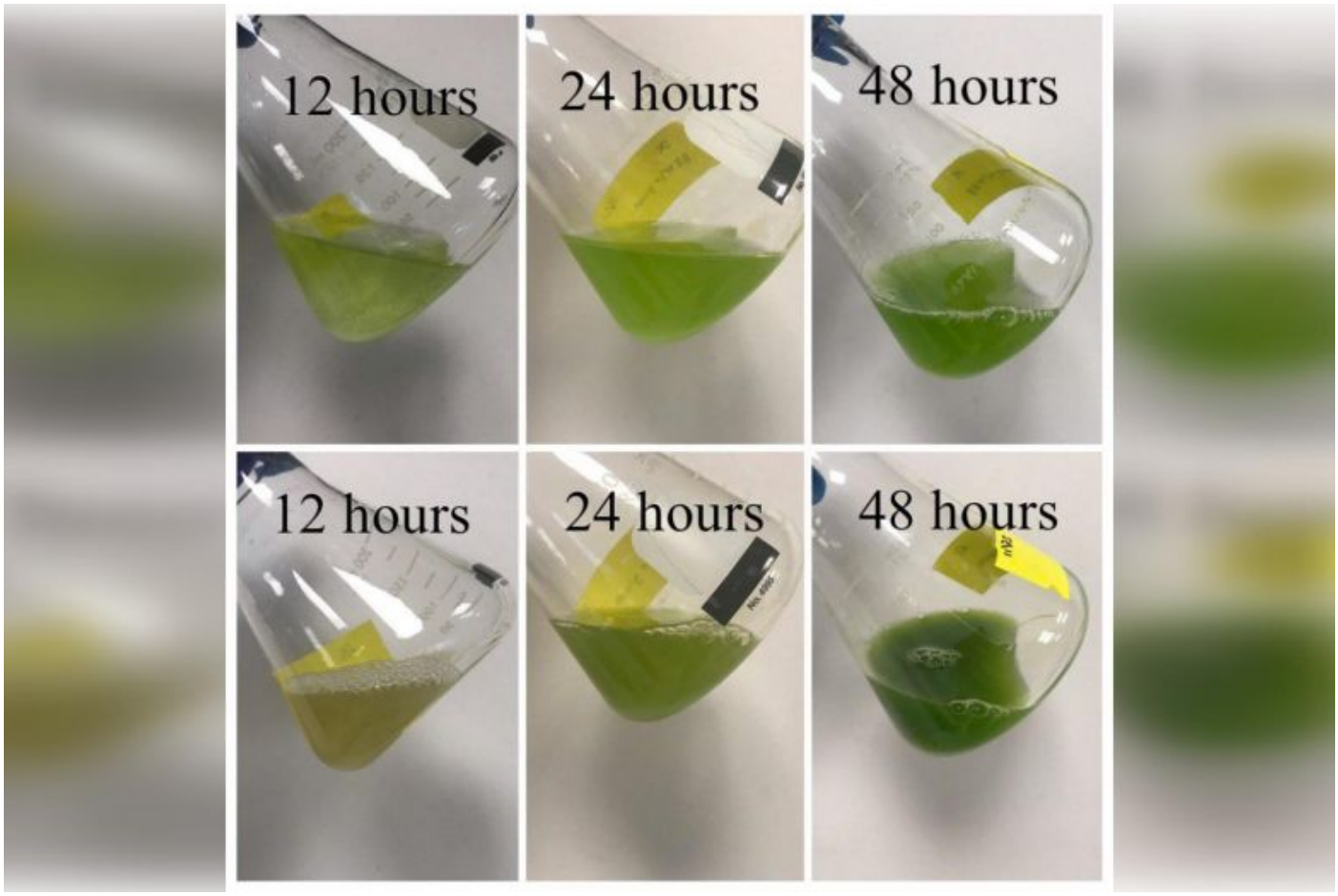
Premium

New method uses food waste to feed protein-rich algae, tripling amount of food source produced: NTU



A new method of growing microalgae, developed by NTU, cuts the cost from about $6 a litre to about $0.67. PHOTO: NANYANG TECHNOLOGICAL UNIVERSITY

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SINGAPORE - A new way to grow an algae-based protein food source not only recycles food waste, but also produces three times the commercial yield in a 48-hour period and at a tenth of the cost.

Speaking to The Straits Times on Saturday (Nov 30), Nanyang Technological University's (NTU) Professor William Chen said his process uses okara, an insoluble waste product from soy manufacturers, to feed microalgae in a fermenter, a device commonly used in urban farming.

"Urban farming need not be a costly affair. This is a closed loop, a self-sufficient source of alternative protein that can grow on a low-cost waste product," said Prof Chen, director of NTU's Food Science and Technology department.

Current commercial methods of growing such microalgae costs about $6 a litre, but the new method cuts that down to about $0.67, an 89 per cent reduction.

Given that this strain of microalgae does not need sunlight to grow, it can potentially be farmed indoors more efficiently and protected from the effects of climate change, noted Prof Chen, who is also the Michael Fam Chair Professor at NTU.

"Photosynthetic microalgae usually produce lipids but not proteins. I think the future is in fermentation of protein-producing microalgae, which are easier to scale up and control," he said.

This strain of microalgae also has an edge over plant-based protein, as it can produce essential vitamins and minerals, while plants cannot.

It shows that there are many possible sources of nutrition in nature that are sustainable and at a low cost without the need to resort to technology such as genetic modification, said Prof Chen.

While NTU has been looking into microalgae research for at least the last four years, the new research was done in partnership with Singapore-registered start-up Sophie's Kitchen after a deal was inked in September.

ST understands that the firm, which sells plant-based "seafood", invested a six-figure sum for NTU's research.

Sophie's Kitchen co-founder and chief executive Eugene Wang foresees commercial use of the micro-algae as a low-cost, "green" protein powder.

Food-grade microalgae protein (in powder form) produced by Sophie's Kitchen. PHOTO: SOPHIE'S KITCHEN

"As the climate changes and population increases, the amount of arable land and fresh water will decrease. We are developing this technology to create a sustainable source of protein," he told ST.

According to Mr Wang, while current algae powder like chlorella can cost more than $30 per kg, a similar product from his firm's strain of microalgae and NTU's new growing method could cost as little as $3 in the future.

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But those who want to get their hands on the final product may have to wait a few more years for issues such as taste to be ironed out.

In June, the firm won $1 million from non-profit Temasek Foundation at the annual Liveability Challenge, a global call for companies to come up with sustainability solutions for tropical cities.

The firm is using the money to build a research and development facility in Singapore.

Mr Wang said the supportive environment here, including the Government's "30 by 30" push - a national target to produce 30 per cent of Singapore's nutritional needs locally by 2030 - makes it an ideal place to develop new food sources.

"I truly believe Singapore will be the centre for new protein in the Asia-Pacific, and possibly even the world down the road."