

From farm to reunion dinner table



VEGETABLES

Kok Fah Technology Farm

From a 3,000 square metre hydroponics greenhouse on its 90,000 sq m of farms in the Sungei Tengah area, Kok Fah Technology Farm has been carrying out research for three years on how to optimise the growth of Asian leafy vegetables in nutrient solution.

Lettuce, kai lan and nai bai are some of the local veggies that it has tested, while tang oh is among those in the next batch slated for experiments.

Besides hydroponics technology such as nutrient films and deep flow, the farm also relies on automation in processes such as climate control, irrigation and seeding.

Kok Fah Technology Farm now churns out four tonnes of vegetables daily, and will add another 1.8 tonnes of greens a day when a new farm in Lim Chu Kang opens in two years' time and hits full production.

What's on your plate? Tech tools have helped farms boost capacity, enhance safety and deliver yummy produce. This Chinese New Year, *The Business Times* looks at some innovations that local growers have been cooking up.

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FISH

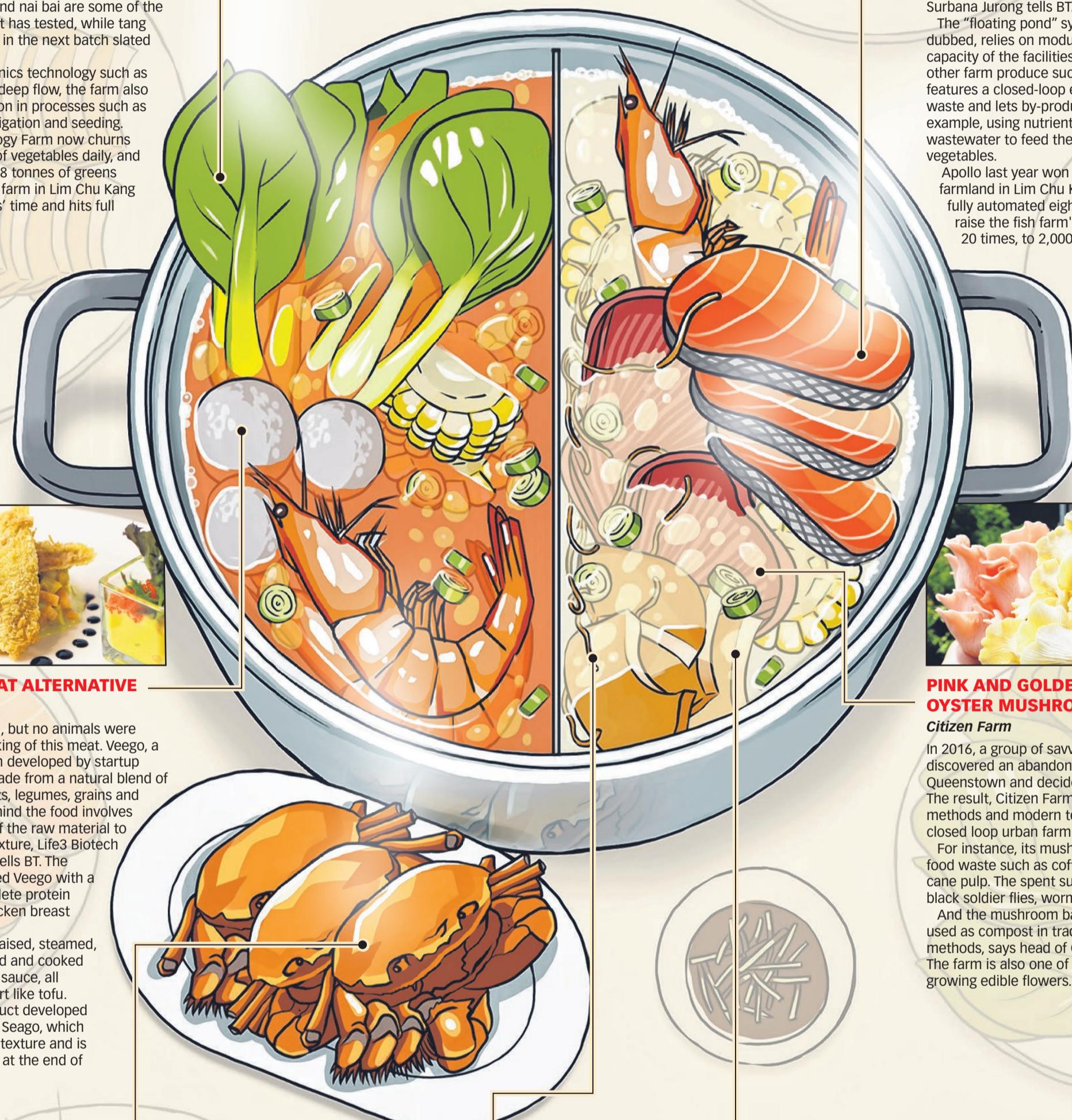
Apollo Aquaculture Group

Apollo Aquaculture Group and Temasek-owned Surbana Jurong have jointly developed a vertical fish farm model for urban landscapes.

This innovative farming concept, which took four years to develop and was unveiled in late 2017, is on track to be rolled out this year, Surbana Jurong tells BT.

The "floating pond" system, as it has been dubbed, relies on modular stacking to raise the capacity of the facilities and can be used with other farm produce such as vegetables. It also features a closed-loop ecosystem that reduces waste and lets by-products be harvested - for example, using nutrients from the purified wastewater to feed the fish and fertilise vegetables.

Apollo last year won a government tender for farmland in Lim Chu Kang with space for a fully automated eight-tier system that could raise the fish farm's annual yield by close to 20 times, to 2,000 tonnes at full capacity.



VEEGO, A MEAT ALTERNATIVE

Life3 Biotech

Tastes like chicken, but no animals were harmed in the making of this meat. Veego, a sustainable protein developed by startup Life3 Biotech, is made from a natural blend of selected root plants, legumes, grains and fungi. The tech behind the food involves the texturisation of the raw material to create a fibrous texture, Life3 Biotech founder Ricky Lin tells BT. The startup also fortified Veego with a high level of complete protein comparable to chicken breast meat.

Veego can be braised, steamed, deep-fried, stir-fried and cooked in curry or teriyaki sauce, all without falling apart like tofu. Another food product developed by the company is Seago, which has a seafood-like texture and is targeted to launch at the end of this year.



CHINESE MITTEN CRAB

Temasek Life Sciences Laboratory

The Chinese mitten crab, also known as the Shanghai hairy crab, is traditionally farmed in freshwater lakes in China. But in recent years, the lakes have been found to contain high levels of pollutants, resulting in supply shortages as the government clamps down on exports.

Temasek Life Sciences Laboratory's (TLL) Recirculating Aquaculture System (RAS) can create a sub-tropical marine condition with low water and land requirements. This allows TLL to adapt the baby crabs to the local warm conditions and grow them to adult size in a pollution-free environment.

The RAS is made up of fully modular components that can be set up in urban areas such as roof tops. The project started in 2016 and the team has developed a prototype comprising a modular vertical fish farm for fish to be cultivated in a safe, scalable and sustainable manner.



CORDYCEPS

Grower Agritech

Singapore startup Grower Agritech's founder, Quek Ser Yong, says that he has put an investment in the "mid-six figures" into the high-value fungi market.

His company, which was set up in April 2017, cultivates cordyceps on demand. Besides being a traditional Chinese medicine, the fungus has non-food uses such as cosmetics ingredients.

Grower Agritech is now working out of a 4,000 sq ft facility in Thailand, but Mr Quek looks forward to bringing it home once he perfects the recipe for his other fungal friend: truffles. He has tapped indoor vertical farming stacks to produce masses as big as four inches (10cm) - but hasn't yet unlocked the secret of making the growths taste like truffles.

When he gets the flavour right - which he hopes to do by 2020 - Mr Quek wants to go commercial with a farming capacity of 20 tonnes every six months.



ABALONE

Oceanus

One of the world's largest land-based abalone farms is operated by Singapore company Oceanus. Its farms located along the coastal lines of Fujian and Guangdong provinces in China churn out over 100 million abalones annually.

But cultivating abalone on land is no easy task. Oceanus' hatcheries are armed with netting to provide shade against excessive sunlight and technology that helps maintain optimal water temperature and cleanliness. Its farms are supplied with high quality seawater through a natural deep water intake. The abalones feed on seaweed jammed full of nutrients too.

Last year, Oceanus inked a pact with Shaw Investment Holdings and China Construction Seventh Engineering Division to explore global aquaculture-related investment opportunities and development projects worth US\$500 million.



RICE

Temasek Lifesciences Accelerator

Singapore's very own brand of rice is the culmination of 12 years of laboratory research and field trials with regional partners.

Temasek Lifesciences Accelerator's (TLA) Temasek Rice was developed using natural selective breeding technology. As a result, it has a nice fragrance and its stalks are shorter and sturdier than that of regular rice varieties, making them less likely to topple from strong winds.

The crop is also imbued with traits to naturally resist bacterial and fungal diseases as well as withstand environmental challenges such as floods.

TLA is working with an Indonesian social enterprise called Bloom Agro to ensure the rice is being grown by the Indonesian farming community in a sustainable manner. Temasek Rice hit shelves in 2016 with its launch at Meidi-Ya supermarket in Liang Court. It is currently also sold at FairPrice Finest, hypermarts, and on Qoo10.