

Health

Supply chain woes boost meat substitutes in Asia, and investors are biting

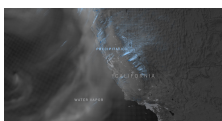
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SINGAPORE — At Love Handle, a deli that labels itself a butcher shop in downtown Singapore, there is no meat for sale. Instead, jackfruit pastrami is sliced into razor-thin strips, minced soy beef is drenched in teriyaki sauce and mushroom steaks are cut into filets.

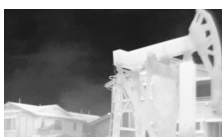
The shop, whose black-and-white checkered interiors hold a butcher block, slicer and mincer, labels itself Asia's first plant-based meat "butchery." It caters to those who want to give up animal meat without sacrificing the comfort of a double cheeseburger and greasy nuggets.

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“Our inspiration was McDonald’s chicken nuggets,” said chef and co-founder Addis Tan, pointing to a steaming batch of breaded chicken substitutes. “We want customers to comfort eat food they can associate with memories or things their mom cooked.”

Love Handle estimates that half of its customers are meat eaters experimenting with plant-based protein. The shop hopes to ease them into meat alternatives with products they can easily identify, such as substitutes for Italian herb meatballs and sausages.

Alternative meats, which may include plant-derived products and animal meat grown from cells in labs, are becoming increasingly popular with consumers and investors. Market revenue is expected to roughly double, to \$12.3 billion by 2029, according to market-research consultants [Fortune Business Insights](#). However, some traditional-meat producers are skeptical that substitutes will continue to see rapid growth. They say alternatives fail to replicate the taste of animal meat and are likely to be eaten regularly only by a small group of consumers.

In regions such as Southeast Asia that have fast-growing populations and are grappling with food export restrictions, substitutes for traditional meat are emerging as a reliable protein alternative. And it’s not just attracting vegetarians: The meat alternatives industry is becoming a darling of food security experts, venture capitalists and companies trying to protect themselves from supply chain crunches.

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Such alternatives often require less space, water, time and materials to make, according to researchers, making them more resilient to the supply chain shocks that have recently plagued the animal meat industry. In parts of the world, such as Northern Europe, some alternatives are becoming as cheap as traditional meat, a shift investors hope will reach more price-conscious consumers in less wealthy countries that are increasingly consuming meat. “Soon having a meat steak will be a premium experience, a treat for a special occasion,” Tan said.

Alternative meats, once considered a costly novelty, have become particularly attractive in the wake of [avian flu](#) outbreaks in Europe, [pandemic lockdowns](#) in China and the [war](#) in Ukraine, all of which battered the global supply of animal protein. In Asia, supplies were further restricted in May when Malaysia announced a ban — since loosened — on chicken exports and India placed curbs on wheat exports, a major ingredient in animal feeds. Global meat prices reached an all-time high in June, according to the U.N. Food and Agriculture Organization’s [meat price index](#). (Prices have dropped

slightly since but are still sharply up from a year ago.) The price of a dozen large eggs in U.S. cities also hit a **record high** of \$3.11 in August.

By contrast, industry professionals say better technology and larger scale have allowed them to sell alternative meats at increasingly lower costs. In the Netherlands, meat substitutes became **less expensive** than animal protein in 2022, according to a study commissioned by a Dutch nonprofit organization that promotes meat alternatives. Some alternative egg products have also reached price parity with animal eggs.

But on average, plant-based meat is two times as expensive as beef, and more than four times as expensive as chicken per pound, according to a 2021 report by the Good Food Institute nonprofit that cited Nielsen data. Some makers of meat substitutes in North America and Britain, such as Beyond Meat, have also struggled with higher costs and were unable to rapidly grow sales this year as inflation gives cost-conscious customers in key markets pause.

For those who have long searched for meat substitutes, lower prices have been a game changer.

Audrey Seah, 54, has been looking for alternative meats to create Southeast Asian dishes such as chicken rice and pulled beef rendang for her vegan husband. A few years ago, the products were too expensive for her budget and hard to find. Now, they have their own section in the frozen food aisle at her local supermarket.

"Prices have gone down, and in some supermarkets, you can now find alternatives at the same price as meats," she said. Lower prices mean the Seah family eats more alternative proteins than ever.

Investors are betting that these trends will continue, and as production of the alternatives increases and prices fall, new markets will open up. "We can't compete with cheap chicken in Indonesia, but it is only a matter of scale," said Michal Klar, a founding partner of Better Bite Ventures, a fund that invests in meat substitute start-ups in Asia. "It's a Tesla model. You start high end, the scale is not quite there, but we are hoping that some countries can leapfrog the transition as people increase meat consumption."

Production of meat alternatives can also be more responsive to changes in demand, said Helga Angelina Tjahjadi, co-founder of Green Rebel, an Indonesian start-up that produces whole cuts of meat substitutes from mushroom fibers and soy. Scaling up production can be as easy as keeping a machine running longer or investing in larger equipment, she said. The company is also able to use the same machines to produce beef or chicken alternatives, allowing them to flip between products to cater to changing demand.

The hype over plant-based foods overlooks a key ingredient: Plants

For William Chen, developing an alternative to meat is a question of national security.

The food science professor at Singapore's Nanyang Technological University has spent years developing a climate-resilient urban farming system, including a mushroom that he says can grow with no light and little water. Potential use cases include feeding a population through droughts, pandemics and even during a nuclear apocalypse.

"You can literally grow them in your cupboard," he said. "They are independent of all these conditions affecting us, like climate change or war." Singapore, a small, densely populated country, imports some 90 percent of the food it needs to feed its 5.6 million people. With land scarce, most farming must be done **vertically**, in rooftop gardens and stacked greenhouses. The country hopes to use alternative proteins, including meat grown in labs and mushrooms bred in urban basements, to help grow 30 percent of its own food by 2030.

The Southeast Asian city-state is also courting companies looking to experiment with new ways of making food. In 2020, it became the first country in the world to allow cultivated meat to be sold to the public. Such meats are produced when cells extracted from living animals multiply in a lab and grow into an edible-size piece of meat.

In June, food tech company Eat Just broke ground on a multimillion-dollar facility in Singapore, the largest cultivated meat production center in Asia, according to the company. The facility will have the capacity to produce tens of thousands of pounds of meat grown from animal cells.

Eat Just also makes mungbean protein eggs, which require 98 percent less water and 80 percent less land to produce, the company said. This summer, it was able to match premium animal egg prices in many markets for the first time, offering its mungbean protein eggs for \$3.99 a bottle, the equivalent of eight eggs.

"It's not that we're completely insulated from the global supply chain ... but we are just less impacted than an egg company would be because we are not relying on a commodity that's going up and down based on all these factors," Eat Just founder Josh Tetrick said.

"A conventional animal protein system is not built for the world of increasing climate risk," said Tetrick. "It's not built for a growing population or a world of water scarcity. It's not built for a world that needs more food security."

But for some consumers, the trade-off remains too costly.


"It's trying too hard and charging too much," said Clare Chua, a 31-year-old business developer, as she bit into a \$17 double cheeseburger with a soy

patty and plant-based cheddar slices at Love Handle. "If you want to go vegetarian, just eat vegetables."

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