

Bug Appétit



Insect farming is gaining traction as a sustainable protein and animal feed alternative

By Sarah Sekula

Chile-lime crickets covered with pumpkin seeds. Granola bites made with cricket flour. Coconut-brittle bugitos. These snack treats made with insects were all dreamed up by Monica Martinez, owner of San Francisco-based Don Bugito.

For her, it's all second nature. In Mexico City, where Martinez spent her childhood, people have embraced entomophagy — the consumption of insects — since the Aztec Empire. Think: tacos filled with chapulines (grasshoppers) and salsa de chicatanas, a spicy delicacy made from flying ants.

“Mexico has over 500 varieties of edible insects and (is) one of the world leaders in entomophagy,” Martinez says. “I wanted to celebrate this rich tradition and bring diversity to the American food system.”

Martinez, a designer and artist, has always been fas-

inated with finding new ways to produce food beyond factory farming. These days she does just that by breeding insects using modular systems. She believes that eating insects could soon become commonplace in the U.S.

She's not the only one. As the executive director of the North American Coalition for Insect Agriculture, it's something Aaron Hobbs also ponders often. He predicts insect consumption in North America will follow a path similar to sushi; unfamiliar at first, but widely welcomed down the road.

Insect flavors are more diverse than you might think — from nutty to zesty to almost chocolatey.



Black soldier fly larvae at Chapul Farms

population surpassed 8 billion in 2022, and the United Nations Population Fund projects it will grow more than 20 percent — to 9.7 billion — by 2050.

Insect farming holds huge potential as a sustainable, efficient way to provide protein for humans and animals. “I wholeheartedly believe the single most impactful investment we can make today is in scaling up insect agriculture,” says Aly Moore, chief communications officer for Chapul Farms in McMinnville, Ore. “Modern agriculture is linear and extractive. We must do a 180-degree flip on how we produce our food to make it regenerative and circular. To achieve this, we must literally close the loop on food production. How? The way nature does: with insects.”

Using agricultural byproducts that would otherwise end up in landfills, Chapul Farms breeds black soldier flies in modular

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According to Cortni Borgerson, associate professor of anthropology at Montclair State University in New Jersey, the best-tasting bug around is sakondry, found in Madagascar. “It tastes almost exactly like bacon, but a little toasty and endlessly snackable,” she says. “Imagine if I told you that you could garden free bacon in your yard?”

INSECT REVOLUTION

Why are experts increasingly looking to insects as a food source for humans, pets and livestock? There are plenty of reasons, beginning with the sheer number of mouths to feed. The global

insect farms in less space than a traditional farm. The insect farms transform organic waste into food and agriculture products. The larvae they breed become animal feed and the frass — bug manure — is sold as soil fertilizer.

Insects are efficient little critters. “While insects can grow relatively fast, during this growth phase they are very efficient, using less energy and producing less waste in the process,” says Christine Picard, biology professor and director of the Forensic and Investigative Sciences Program at Indiana University-Purdue University Indianapolis. “Pitting an insect (against) a cow may not be a fair fight — the insect will always win — but as an example, it demonstrates the value.”

Picard cites feed-conversion ratios — the amount of feed consumed divided by the amount of output — to determine an animal’s relative efficiency. “For insects, it can vary depending on what it is being fed, but this is



Don Bugito owner Monica Martinez and husband Aaron Foley



typically less than two (to one), hovering around one,” she says. “For a cow, this is typically around 10 — that is, you need 10 times the amount of food to feed the cow than it makes into food.”

INCREASED INVESTMENT

EnviroFlight has a commercial plant in Maysville, Ky., where it produces black soldier fly larvae (BSFL), meal, oil and frass in mass volume. Its Innovation Center in Apex, N.C., houses research and development programs focusing on genetics, immunol-

ogy, feedstock assessment, BSFL biology and animal nutrition. Innovafeed, a France-based global leader in the insect-agriculture space, is building a facility in Decatur, Ill., scheduled to open later this year.

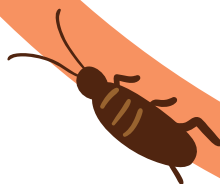
Using insects, instead of soy and fish, to feed animals is an excellent source of protein for chickens, pigs and fish, who already eat insects naturally. And within the pet industry, demand for insect protein is huge.

Take Anne Carlson’s company, Jiminy’s, for



Jiminy's cricket-based dog food

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500

varieties of edible insects

can be found in Mexico. The country is a world leader in entomophagy, which is a rich part of several Indigenous cultures.

example. It started using powdered-cricket protein in its dog food and treats seven years ago and hasn't looked back.

Carlson admits that, initially, there were a lot of "ooh, ick" reactions from people. "I got it, though," she says. "Insect protein is a radical change."

Jiminy's sources crickets from farms across the U.S. and Canada. "We've been a top consumer of the protein since we started," Carlson says, adding that insect farming "is a fast-growing business, thank heavens."

Why are Carlson and others encouraged by rapid growth in this sector? At the top of the list is the fact that one-third of the world's cropland is used to grow animal feed, Borgerson says. "As our communities grow and become wealthier, pet ownership and meat consumption are rising, but the amount of land we have isn't."

One solution is to use that land in smarter and more efficient ways. "Sustainable



insect farming can turn food and vegetable wastes into high-quality insect feed in much smaller spaces," she says. "It's a win-win for biodiversity and livelihoods, and it makes sense."

THE BENEFITS

The U.S. government is investing in insect agriculture. "The National Science Foundation recognized the need for more foundational research and discovery in this space and is committed to investing on the order of \$4.5 million, with the possibility of more," Picard says.

Tyson Foods recently made a significant investment in the industry via a partnership with Protix, a leading insect ingredients company, says Hobbs. "They join ADM, which is partnering with Innovafeed. Cargill also made some announcements with Ynsect" recently about developing U.S. operations, he says.

As the industry expands, Hobbs says he hopes to see "large insect farms co-located with organic waste producers, with the associated safety and regulations to use that insect protein for feed and food."

Like any relatively new industry, there are challenges. "It's not an easy industry to just get into," Picard says. "You are growing these really massive colonies of insects — hundreds of millions in some places — to maintain the health of the colony. Another drawback is a consistent source of the (agricultural)



Grasshoppers at a market in Madagascar

waste products used to feed the insects."

With the proper investment, efficient and sustainable insect farming "could be broadly integrated into (domestic) food and feed systems in the next few decades," Borgerson says. "While much of that effort might go invisible, it's essential if we want to balance our lifestyles with biodiversity conservation."