

'MODIFIED' FOOD CART ON WASHINGTON MALL MARCH 21-22

In a bid to increase awareness about the value and good taste of genetically modified (GM) food, the Alliance for Science “[Modified](#)” food cart will be passing out samples of GM fruit March 21-22 on the National Mall in Washington, DC.

“Genetically modified products have been plagued by misinformation and deliberate disinformation campaigns,” said Joan Conrow, AfS managing editor. “Modified is a way to demystify these products and show how the technology is increasingly being used to benefit farmers, consumers and most importantly, the environment that sustains us all.”



Sarah Evanega staffs the Modified food cart. Photo: Alliance for Science. [Link here.](#)

Modified will be joining other sectors related to farming in the American Equipment Manufacturer's (AEM) Celebration of Modern Agriculture on the National Mall. The event will be staged between 9 am and 5 pm both days outside the US Department of Agriculture headquarters between the Smithsonian Museums.

The show will feature farmers, ranchers and agriculture innovators on the cutting-edge of science and technology. All of the exhibits will showcase the advancements that allow US agriculture to produce more while working to shrink the industry's environmental footprint.

The Modified food cart, which reflects imagery from the “mod scene” popular in the 1960s, is an educational tool based on the premise of “eating is believing.” It gives consumers a chance to try modified foods and ask questions about biotechnology and its use in agriculture and food production.

Modified will be offering samples of the non-browning Arctic apple; pink glow pineapple, a colorful version of the tropical fruit; and papaya resistant to the devastating ringspot virus — a public sector crop developed by Cornell University scientists that saved Hawaii's small papaya farms.



A crowd gathers around Modified for GMO food samples at the January 2020 Plant and Animal Genome (PAG) conference in San Diego. Photo: Alliance for Science. [Link here](#)

The three products offer tasty examples of how the technology can be used to reduce food waste, support small farmers, appeal to consumers' desire for novelty items and slash the use of agricultural chemicals.

The [Alliance for Science](#) is a global communications initiative based at the [Boyce Thompson Institute](#) on the Cornell University campus. It is dedicated to sharing accurate, evidence-based information about agricultural biotechnology, climate change, vaccines and COVID-19. It works internationally to share accurate information about controversial science issues and ensure that farmers everywhere can access agricultural innovations.



Modified food cart. Illustration: Wenceslao Almazan [Link here](#).



ALLIANCE FOR SCIENCE PRESENTS

WHY MODIFY?

DID YOU KNOW THAT NATURE HAS BEEN MODIFYING PLANTS AND ANIMALS FOR EONS?

Learning from Nature,
scientists have developed
a field of science called
biotechnology.

They use these innovative
tools to efficiently develop
crops and livestock with
beneficial traits.

Like higher yields. Better
nutrition. Pest protection
without the use of pesticides.
And the ability to tolerate the
heat, drought and rainfall
extremes of climate change.

MODIFIED FOOD HAS A POSITIVE IMPACT ON THE WORLD BY:

- Reducing climate change impacts
- Making agriculture more sustainable
- Supporting food security
- Improving the lives of smallholder farmers around the world
- Preventing the loss of popular foods, like banana, coffee, oranges, and chocolate

Modified products are known by many names: GMOs, CRISPR, gene editing, genetic engineering and bioengineered. They are developed by university scientists, big corporations, small start-ups and government researchers across the world.

Whatever you call them, they're here to stay, and they're here to help.

MODIFIED

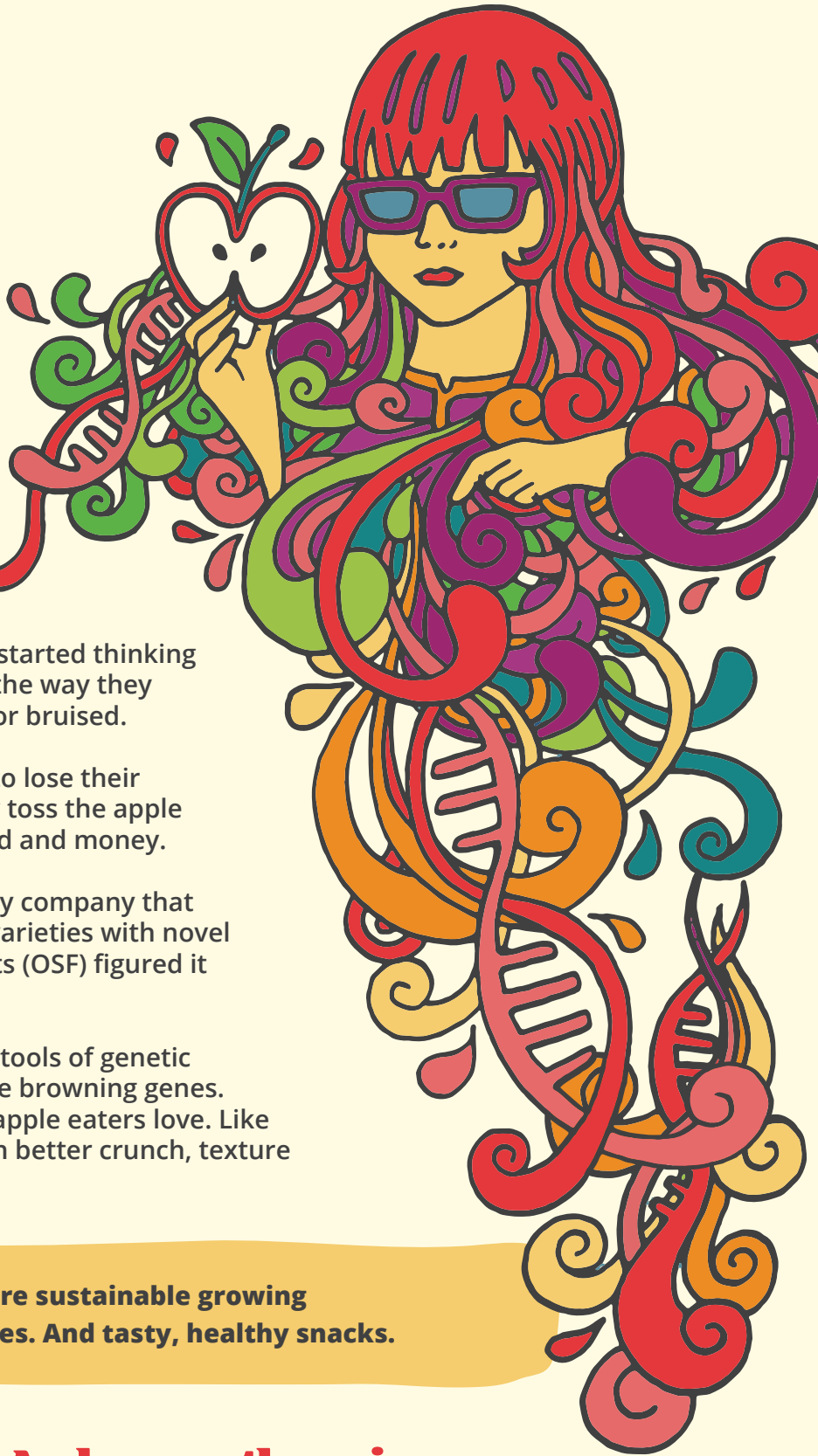
**TRY SOMETHING MODIFIED.
AND SAVOR THE SCIENCE.**



ALLIANCE FOR SCIENCE
a global initiative for science-based communications

Alliance for Science
presents

THE GMO APPLE STORY



Once upon a time, a food company started thinking about apples. Or more specifically, the way they begin to brown when bitten, sliced or bruised.

That browning causes picky eaters to lose their appetite. Next thing you know, they toss the apple in the trash. The result? Wasted food and money.

As a small agricultural biotechnology company that specializes in developing tree fruit varieties with novel attributes, Okanagan Specialty Fruits (OSF) figured it could **find a solution**.

So the Canadian company used the tools of genetic engineering to safely “switch off” the browning genes. While keeping everything else that apple eaters love. Like good taste. Solid nutrition. And even better crunch, texture and visual appeal.

GMO apples mean less waste. More sustainable growing practices. New menu opportunities. And tasty, healthy snacks.

What do you think?

Try an Arctic apple. And savor the science.



ALLIANCE FOR SCIENCE
a global initiative for science-based communications

MODIFIED

TRY SOMETHING MODIFIED. AND SAVOR THE SCIENCE.

Alliance for Science presents **The GMO Papaya Story**

Once upon a time, papaya farmers in Hawaii made a horrible discovery: **the ringspot virus was wreaking havoc on their trees.**

Desperate to save their farms, they began cutting down infected trees. No luck. The virus steadily spread. "Slow death," the farmers called it.

Hawaii's papaya industry teetered on the brink of collapse.

Enter Dr. Dennis Gonsalves. Born on the Big Island of Hawaii, and trained in plant science at Cornell University, he used genetic engineering to breed papaya trees with inherent resistance to the ringspot virus.

The virus-resistant seeds were distributed free of charge to Big Island growers on May 1, 1998. Within a year, farmers were harvesting healthy fruit with no trace of the ringspot virus. Pesticide use dropped, yields increased, and production flourished

This tale has a happy ending in Hawaii. But it's still a sad story in countries where fear-driven anti-GMO regulations have prevented farmers from accessing this technology.

What do you think?
Try a papaya. And savor the science.



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MODIFIED
TRY SOMETHING MODIFIED. AND SAVOR THE SCIENCE.



ALLIANCE FOR SCIENCE PRESENTS

THE GMO SALMON STORY

ONCE UPON A TIME, THE FOLKS AT AQUABOUNTY DECIDED THERE HAD TO BE A SUSTAINABLE WAY TO DELIVER NUTRITIOUS SALMON TO YOUR PLATE.

A way to cut the high carbon footprint of flying in tons of salmon to satisfy our voracious appetites. A way to reduce the amount of time — and fish feed — needed to get salmon to a marketable weight. A way to protect wild salmon fish stocks from overfishing.

They found their answer in genetic engineering. Through a one-time gene modification made 30 years ago, scientists were able to help salmon reach their prime harvest weight faster, without sacrificing nutritional value or taste.

What's more, the salmon are raised in fully contained land-based tanks designed to protect the environment. So, AquaBounty salmon is free of the antibiotics and other contaminants that can be a concern with traditional sea-cage farms and net pens.

AquaBounty salmon are sustainable because they consume 25% less fish feed than conventional Atlantic salmon and are raised in the American Midwest, which eliminates the need for air transportation. They also help reduce pressure on wild salmon stocks. And no, there's no danger of them getting out and breeding with wild Alaskan salmon or any other fish. The land-based farms are designed with multiple layers of containment to prevent escapes.

**SAFE.
TASTY. FRESH.
AQUABOUNTY IS
PIONEERING THE
FUTURE OF
SUSTAINABLE
SEAFOOD.**

**TRY
AQUABOUNTY
SALMON. AND
SAVOR THE
SCIENCE.**



ALLIANCE FOR SCIENCE
a global initiative for science-based communications

MODIFIED
TRY SOMETHING MODIFIED. AND SAVOR THE SCIENCE.



10 MYTHS ABOUT GMOs



ALLIANCE FOR SCIENCE

GMO stands for genetically modified organism. It most commonly refers to organisms—often plants—that have been modified to achieve desired traits, like drought-tolerance and pest-resistance, using recombinant DNA techniques or genetic engineering (GE). It's a misleading term, since we've been modifying the genetics of organisms since the dawn of agriculture. But the name isn't the only thing that people get wrong.



MYTHS

Farmers can't save GMO seeds.

REALITY

It is true that patented GMO seeds are often protected by intellectual property rules, meaning farmers must pledge not to save them and replant. Monsanto says it has sued about 150 farmers who it claims broke these rules over the past 20 years. However, hybrid seeds, which have been around for decades, also need to be purchased each season because they don't breed true, so this is not a new issue for many farmers. In both cases, farmers choose to purchase these seeds because they get a better yield and make more money. In addition, in many public sector projects, such as the Hawaiian papaya, insect-resistant eggplant in Bangladesh, and Water Efficient Maize for Africa, farmers are free to save and share GMO seeds and no royalties are charged.



MYTHS

GMOs are a corporate plot to control developing nations and the world's food supply.

REALITY

Developing nations are increasingly choosing GMOs, and for the fourth year in a row, devoted more hectares to growing biotech crops than developed nations. Farmers in these countries choose biotech because these crops have helped to alleviate hunger by increasing incomes for 18 million small-holder farm families, bringing financial stability to more than 65 million people in developing nations. This technology should not bypass the poor, who are arguably those who stand to benefit most.



MYTHS

GMOs are a ploy by agrichemical corporations to sell more pesticides/herbicides.

REALITY

Some GMO crops—such as Roundup Ready—can tolerate applications of herbicides, a trait that reduces the need for hand weeding or mechanical cultivation, which disturbs the soil. People sometimes imagine that GMOs use more insecticides, but the reverse is true with GMO crops that are bred with a natural form of insect-resistance, thus minimizing or eliminating the need to spray pesticides for crop protection. Overall, scientists say GMOs have reduced the use of chemical pesticides—both herbicides and insecticides—by 37%. (Qaim et al. 2014).



MYTHS

GMOs are used only in industrial, chemical-intensive agriculture.

REALITY

The technology of genetic engineering can be used in multiple ways, including reducing pesticides. Today many GMO crops are being bred in developing countries by public sector scientists who are working to improve the nutritional content and viability of staple food crops key to their region, such as cassava, pulses, mustard, brinjal, potatoes, rice, and bananas. Small-holder farmers typically grow these crops to feed their families.



MYTHS

GMOs are not adequately tested

REALITY

Governments everywhere employ strict biosafety protocols to ensure that any new GM product poses no threat to human or animal health, or the environment. These protocols include laboratory and field tests that may span many years. The resulting plants and foods are far more thoroughly tested than their conventional counterparts. Hundreds of scientific papers have assessed the safety of GM crops, and the vast majority found they are nutritionally equivalent to their conventional counterparts.

10 MYTHS ABOUT GMOs



ALLIANCE FOR SCIENCE



MYTHS

GMOs are harmful to the environment.

REALITY

Farmers who grow GMO commodity crops, like soy and corn, do less tilling, which reduces topsoil loss, erosion, and the associated runoff of fertilizer. They also can cultivate pest-resistant GMO crops, like Bt cotton, corn, and eggplant, with far fewer applications of pesticides, which benefits human and environmental health. Agriculture and its associated land use accounts for over a quarter of all global greenhouse gas emissions. On average, GE crops have reduced chemical pesticide use by 37%, increased crop yields by 22%, and increased farmer profits by 68%. GE crops also have reduced CO2 emissions (mostly through enabling no-till farming practices) by 27 billion kg—equivalent to taking 12 million cars off the road (Qaim et al. 2014).



MYTHS

GMOs are unhealthy.

REALITY

GMO foods have a long, safe track record during their more than 20 years on the market. The prestigious National Academies of Science agrees with US regulatory agencies, scientists, and leading health associations worldwide that food grown from GM crops is safe to eat, and no riskier than consuming the same foods containing ingredients from crop plants modified by conventional plant breeding techniques. Banning GMOs results in negative health consequences because farmers would be forced to go back to using older, more toxic pesticides and access to food is more limited.



MYTHS

GMOs are unnatural.

REALITY

Humans have been selectively breeding plants and animals for countless millennia, so all domesticated plant species—and even your pet dogs and cats—are technically genetically modified. Genetic engineering replicates a process that has been occurring in nature for millions of years as bacteria and viruses regularly shuttle genes between different species.



MYTHS

Organics are safer than GMOs.

REALITY

Organic farming is a cultivation method, and GMOs are a breeding method, so it's like comparing apples and oranges. Additionally, organic growers are allowed to use certain types of pesticides, so some GMOs could claim to be safer than organics. An example might be a GM blight-resistant potato, which does not need toxic substances like copper sulfate or other fungicides often used to control blight in organic farming. Ideally, genetic modification would be used to improve organic farming.



MYTHS

GMOs won't feed the world.

REALITY

No one plant breeding or agricultural system can or will feed 9 billion people in a sustainable manner. There is no "silver bullet." We need everything to help contribute to this goal: conventional, organic, biotech, small-holder, large-scale, as well as better distribution and storage systems, and less food waste, too.

www.allianceforscience.cornell.edu

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October 1, 2019



New “Modified” food cart supports GMO products

The Alliance for Science today launched “Modified,” a hip food cart that celebrates the innovative use of technology in food.

With its colorful “mod” paint job, the eye-catching cart is intended to engage eaters in conversations about genetically modified food, said Sarah Evanega, executive director of the Alliance.

“As [synthetic biology](#) and gene editing tools like CRISPR continue to advance, we will be seeing more modified food products hit the market, particularly in response to mitigating the impacts of climate change,” Evanega said. “We want to give consumers a fun venue to talk about and sample these foods. Eating is believing.”

Modified will make its debut at the Oct. 1-3 [SynBioBeta conference](#) in San Francisco, where hundreds of tech innovators and companies converge to learn about the latest developments in synthetic biology and its applications in food, agriculture, medicine and industry.

“We’re so pleased to support the launch of Modified at SynBioBeta ‘19,” said John Cumbers, founder and CEO of SynBioBeta. “We’re passionate about education and the use and adoption of biotechnology. Modified is a creative way to share that passion with consumers.”

The cart will be staffed by the “mod squad” — science ambassadors who can discuss the need for modified crops in countries across the globe. At SynBioBeta they’ll be distributing free samples of two genetically modified foods: the browning-resistant [Arctic apple](#) and the virus-resistant Hawaiian Rainbow papaya grown by the [Kamiya family farm](#).

“We see Modified as a great opportunity for progressive companies to showcase their modified products,” Evanega said. “By pairing samples with informed, thoughtful conversations, we can help consumers better understand the use of biotechnology in food and agriculture.”

Consumers are often unaware of the role that modified crops can play in making agriculture more sustainable. Reducing pesticide use, food waste and carbon emissions are just some of the benefits of modified products now on the market. Research is under way on plants that can produce greater yields through more efficient photosynthesis, as well as crops that can thrive without the application of nitrogen fertilizers.

“Technology is ushering us into a very exciting time in agriculture and food,” Evanega said. “We think Modified can help people see how the old and the new can merge to provide us with innovative solutions to the grave challenges we face.”



TECH

As Silicon Valley faces a tech reckoning, biologists point to the next big opportunity

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Christina Farr

KEY POINTS

- Many of Silicon Valley's top investors believe that synthetic biology will drive some of the largest and most important companies in the next century.
- Entrepreneurs converged this week at SynBioBeta, a conference that outgrew its former space and moved into a converted Honda dealership.
- These founders are a "new breed," said Andreessen Horowitz' investor Jorge Conde, adding that they remind him of some of the first generation of Silicon Valley tech entrepreneurs.



Senior automation engineer optimizing automated lab protocol on colony picker.

At one of the world's largest synthetic biology conferences this week, a food truck handed out papaya and yogurt samples to hundreds of attendees.

The papaya wasn't any ordinary papaya: It was a genetically engineered fruit that [Dr. Dennis Gonsalves](#) designed to be naturally resistant to the ringworm virus. Because of his invention, pesticide use dropped in Hawaii and production flourished.

[The conference was SynBioBeta](#), and it has gotten so big that it moved this year from a conference center in San Francisco's Mission Bay, which is often reserved for biotech meetings, to a large converted Honda dealership on the grittier side of San Francisco's downtown core. The event has been around since 2012 to bring together founders working on biological alternatives to chemical-based processes, and its organizer John Cumbers previously worked as a synthetic biologist at NASA.



The event was a refreshing break from the current malaise facing the traditional "tech" industry.

Many of the big consumer tech companies that started after the Great Recession, like [Uber](#) and WeWork, were supposed to make investors and employees rich, but instead have collapsed in value amid scandals and persistently unprofitable business models. Giants of the industry, like [Facebook](#) and [Google](#), are under assault from both sides of the aisle in Washington, D.C., for being too powerful, too careless with privacy and too

addictive. Venture capitalists are [fighting with banks](#) over the IPO process. The smartphone revolution is more than a decade old, and the would-be replacements -- [self-driving cars](#), computerized [eyeglasses](#) -- always seem to be another five to ten years away.

This conference presented a much more optimistic view of technology's potential, focused on biology rather than microprocessors.

At booths stationed throughout the space, entrepreneurs presented inventions ranging from industrial robotics to designer proteins. They all hailed from different industries including retail, food and manufacturing, but they shared a common vision that after decades of investment in information technology, it was biology's turn.



A food truck promoting GMOs

Christina Farr, CNBC

"The conference has an irreverent, counter culture vibe to it," said Jorge Conde, an investor at Andreessen Horowitz, who spoke at the event. Conde said that the founders are a "new breed" and they reminded him of the first generation of Silicon Valley entrepreneurs in the era of Steve Jobs.

“You’re seeing this explosion of creativity, and also idealism,” he said. Many of the founders, he noted, are attempting to build real, money-making businesses while also attempting to create solutions that are more sustainable and eco-friendly in an era of climate change.

Conde, who has been attending the event for a few years now, described synthetic biology as “the ability to design or program organisms to make things for us.”

He’s one of a growing number of investors in the space, alongside [billionaires like former Microsoft founder Bill Gates and Amazon CEO Jeff Bezos](#), who are spurred in part by the success of the [Beyond Meat IPO](#). Former Google CEO Eric Schmidt [personally spoke at the event](#), noting that “biology will undoubtedly fuel computing.” The synthetic biology market [is now expected to hit](#) \$55 billion by 2025.

Building the next platform

In recent years, venture-funded companies like Zymergen and Ginkgo Bioworks have raised hundreds of millions of dollars in venture capital to provide a platform of sorts for the next generation of synthetic biology companies. The idea behind them is to make it easier for companies like [Beyond Meat](#) to flourish on the consumer side, but also to support industrial applications. (Note that Beyond Meat is the one tech-related IPO that’s done spectacularly well this year, and is the [only reason](#) overall tech IPOs are outperforming the S&P 500.)

Ginkgo, for instance, is looking to spur a slew of new plant-based alternatives to meat [by funding research into proteins and developing the key ingredients](#) in the lab, so that food companies can focus on things like texture and flavor. Founded by a group of MIT scientists, it uses genetic engineering to design and print new DNA for a range of organisms, including plants and bacteria.

“A lot of start-ups come to this conference, but I’ve also seen ‘futures’ teams here from big companies like Lululemon and Adidas,” said Christina Agapakis, a scientist turned creative director at Ginkgo, which has raised more than \$700 million in venture capital. “These are people who are looking ten years out for new materials, and for more renewable and biodegradable options.”



Christina Agapakis, a synthetic biology writer with Ginkgo Bioworks, displaying the company's magazine.

Christina Farr | CNBC

Ginkgo, one of the larger companies at the conference, set up its own espresso coffee booth and handed out a magazine called Grow to promote genetically modified organisms or GMOs. It also highlighted some of the companies that Ginkgo has started to invest in, like Motif, which is helping foster a lot more companies like Impossible Foods and Beyond Meat by working on the plant-based proteins that provide that meat-like flavor, and Cronos, which is looking to create rare strains of cannabinoids in the lab, some of which are being researched as a pain management solution for chronically ill patients.

"A lot of folks in our world aren't using the term 'GMO,' and instead will say it's something like 'gene modification' or 'CRISPR,' said Agapakis, referring to a technique that allows for specific and rapid modification of DNA in the genome.

But Agapakis' company is embracing it. At last year's SynBioBeta, attendees took selfies in front of an "I heart GMO" sign. Agapakis is hoping that her company can help make GMOs distinct from companies like Monsanto, which spurred a reaction from activists for its use of [genetic engineering to promote profits](#). Ginkgo is hoping to revitalize the term, and associate it with socially-conscious products like meat-free burgers and cow-free leather.

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