

# From Lab to Table: The Potential of Lab-Grown Meat and the Protectionist Push to Ban It

By Paul Best

An army of start-ups backed by investors with deep pockets is trying to turn lab-grown meat into a reality, promising slaughter-free products with less of an environmental impact than traditional agriculture. But even as technological setbacks and challenges abound for lab-grown meat, some elected officials are trying to kneecap the nascent industry with protectionist bans before it has a chance to get off the ground.

The first taste of a lab-grown burger—a five-ounce patty made of breadcrumbs, egg powder, red beet juice, saffron, and 20,000 cell-cultivated muscle strands—was in London in 2013. Google cofounder Sergey Brin bankrolled the \$325,000 project, which he called a “proof of concept” warranting optimism that the cultivated meat industry could “really scale by leaps and bounds.”

Mark Post, a professor at Maastricht University in the Netherlands who spearheaded that first cultivated burger, said at the time that it would be 10 to 20 years before products hit the market. In the decade since, private investors have poured \$3.1 billion into more than 170 companies trying to produce cultivated

meat that is both appetizing and affordable for consumers.

Investors range from tech visionaries like Brin and Microsoft founder Bill Gates to traditional meat giants like Tyson and JBS. Many of them have been drawn not only to the rapidly expanding market for meat but also to the potential to alleviate many of the animal welfare concerns and possible environmental harms associated with conventional meat production.

By some reports, the livestock sector accounts for about 15 percent of all human-induced greenhouse gas (GHG) emissions. Roughly a quarter of the Earth’s ice-free land is used for livestock grazing, which can lead to other environmental harms like deforestation, biodiversity loss, and water



Private companies are racing to develop the technology for mass-produced lab-grown meat, such as these chicken skewers created by GOOD Meat.

pollution. Innovations in agriculture and advances in animal science have reduced these environmental impacts over time—livestock now use 62 percent less land and emit 48 percent less GHG emissions per calorie than in 1961, according to one study. That has freed up resources for further innovations that have improved human well-being. Investors in lab-grown meat production believe that cell-cultivated goods can be one of the next steps in dramatically reducing agriculture’s environmental impact while supplying the world with affordable food.

“You’ve got this problem where you have meat being a relatively inefficient form of protein, you have global protein demand increasing, and then . . . as countries develop, a higher percentage of their protein demand is for conventional meat. Something’s got to break,” said Tom Rossmeissl of GOOD Meat, which is one of two cultivated meat companies approved to sell products in the United States.

“We need to find more tools to address the demand for protein, and cultivated [meat] is not the only tool but, I think, a really promising one that lets consumers have something that they want and they crave in the marketplace without having to have that detriment on our planet.”

GOOD Meat started selling products in Singapore in 2020 and then partnered with Washington, DC’s China Chilcano—one of the restaurants owned by acclaimed chef José Andrés—for a limited tasting menu in 2023 after getting final approval from the Department of Agriculture and Food and Drug Administration. UPSIDE Foods, the other company that has won regulatory approval, started selling cultivated chicken in 2023 at the Michelin-star restaurant Bar Crenn in San Francisco.

But letting consumers have their choice in the marketplace has not been a priority for some elected officials. Florida and Alabama both banned cultivated meat earlier this year, turning the issue into a



ABOVE: Justin Kolbeck (left), a former diplomat, and Aryé Effenbein (right), a cardiologist, founded the lab-grown salmon company Wildtype in 2016.

LEFT: Companies have created lab-grown meat on a small scale using cell culture dishes and bottles but have struggled to scale the production process using large bioreactors.

new front for the culture war mixed with blatant protectionism.

“Florida is fighting back against the global elite’s plan to force the world to eat meat grown in a petri dish or bugs to achieve their authoritarian goals,” Florida Governor Ron DeSantis said after signing a bill that makes it a criminal offense to manufacture and sell cultivated meat. “Our administration will continue to focus on investing in our local farmers and ranchers, and we will save our beef.”

At the bill-signing ceremony, DeSantis was flanked by a group of cattle ranchers who would benefit from such measures. Other elected officials have also invoked protectionist reasons for bans on cultivated meat. In Alabama, Jack Williams, a Republican state senator, said his bill is about “protecting our farmers and the integrity of American agriculture.”

At the federal level, Sen. Mike Rounds (R-SD) introduced a bill this year that would ban cultivated meat in schools, saying that the legislation “benefits South Dakota producers.” A press release about the bill from Sen. Jon Tester (D-MT), who coauthored it with Rounds, was headlined

by the boast that “Tester champions Montana’s ranchers.”

UPSIDE Foods challenged Florida’s ban in federal court in August, arguing that it violates the supremacy and commerce clauses of the Constitution and was enacted only to protect the state’s cattle industry.

“Our intent was never to be a political issue. We believe this is about consumer choice and about American innovation, and that is the case with any other number of industries that have somehow been cast into a political light,” Amy Chen, UPSIDE Foods chief operating officer, told *Free Society*.

“Our sense has always been: If you aren’t excited about cultivated meat, if you don’t think it has a place in your life, then don’t buy it. No one, and certainly not us, is trying to force anybody to make a choice that they don’t want to make. We simply believe that our markets work well when they’re allowed to work, and we have a proposition that we are excited to share with consumers.”

While lawmakers in Florida, Alabama, and other states are pushing bans on lab-grown meat, a technological race is still underway to figure out how to mass-produce it. A sample of stem cells is placed in a large tank

called a bioreactor, where it’s mixed with a solution of proteins, vitamins, minerals, and other nutrients the cells need to multiply and grow. After these cells turn into muscle, fat, and other tissues, they are harvested and shaped into products that consumers are familiar with, such as ground meat or steaks.

Cultivated chicken and beef have been the main focus of investment so far, but companies are also working on lab-grown pork, duck, seafood, and even organ meats. For some of these products, the selling point is that they are not only better for the environment but also healthier for humans.

“Because we polluted our oceans and our rivers so much, it’s very hard to find seafood that doesn’t have some level of mercury or microplastics, antibiotics, arsenic,” said Justin Kolbeck, the cofounder of Wildtype, a cultivated salmon start-up. “So, there’s a really important public health benefit, I would say in particular, for this kind of [cultivated] seafood. From a food safety perspective, we’ve had a very high degree of confidence that this is the safest salmon you can eat on the planet for years now.”

But the quest for rows of bioreactors growing slaughter-free meat has not come without setbacks. A Bloomberg investigation earlier this year claimed that UPSIDE can still only grow small amounts of chicken cells that are harvested bit by bit and molded by hand, a much more time-consuming and labor-intensive process than many envisioned. A *New York Times* report detailed challenges at GOOD Meat, including lawsuits over allegedly unpaid bills and a contaminated cell line for duck products.

The much-heralded environmental benefits have also been called into question. In a paper that has not yet been peer-reviewed, researchers at the University of California, Davis, found that

the environmental impact of cultivated meat could be orders of magnitude higher than conventional meat production in the near term, given current technology and production processes.

Parts of the industry have been prone to hubris, but many of these start-ups are not evasive about the technological challenges that lie ahead.

“We’re not surprised that there’s skepticism,” said Rossmeissl of GOOD Meat, pointing to deep-seated skepticism of other emerging technologies over the past century, such as satellite communications, the home computer, and electric vehicles.

“We know there’s a series of things that we have to overcome in order to achieve mass scale and get to price parity. . . . How do we bring down the cost of the growth media? How do we increase cell density? How do we bring down the cost of bioreactors? [Those are] three of hundreds of R&D challenges ahead of companies like us and the broader industry. We’re working on it—all these things are ultimately achievable, but it’s going to take a lot of resources.”

It is impossible to say for sure whether consumers will embrace cultivated meat, much less whether these start-ups will figure out how to mass-produce it at an affordable price. But innovation thrives only when the fate of new technologies is determined by consumers, not lawmakers eager to shield entrenched interests from competition. Elected officials should let cultivated meat live or die by its merits. ♦

#### ABOUT THE AUTHOR

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