

# SUPPORT SUSTAINABLE PROTEIN PRODUCTION: PLANT-BASED MEAT AND CULTIVATED MEAT

**“What I was experiencing was more than a clever meat substitute. It was a taste of the future of food.”**

– Bill Gates, commenting on Beyond Meat’s plant-based chicken. Beyond Meat is a plant-protein company founded by Columbia Business School graduate Ethan Brown. Gates has since become an investor in Beyond Meat, and former McDonald’s CEO Don Thompson is a board member.

The protein industry is on the cusp of a market revolution. Consumers are demanding alternatives to conventional meat, dairy, and eggs, and by 2030, the value of the global alternative protein market could reach \$140 billion.<sup>1</sup>

The United States is currently home to many of the world’s leading alternative protein companies. However, other governments worldwide are beginning to recognize the economic, environmental, and public health benefits of alternative proteins. Many of these governments are now investing in research and development to advance plant-based and cultivated meat, egg, and dairy production in their countries.

The United States can remain the global leader of the alternative protein sector and benefit from the economic strength that comes with this position. To do so, we must make a concerted effort to advance the science and technology that will enable this sector to expand rapidly and flourish. By supporting the burgeoning market for alternative proteins and funding open-access research for improved protein production, policymakers can enable business innovation while increasing consumer choice, conserving resources, and strengthening food safety and security.

“Alternative protein plays an important role in our ‘future of food’ agenda.... When we look at the data, we see a fundamental change in eating patterns among meat-eaters across demographic groups. It’s not just in the cities, not just on the U.S. coasts, not just with young people. So we see it as more of a lasting component of the broader protein-consumption landscape....”<sup>2</sup>

– Justin Whitmore, Tyson Executive Vice President for Alternative Proteins



Photo credit: Tofurky

# 55,634 jobs

CREATED BY THE PLANT-BASED FOODS INDUSTRY<sup>3</sup>

# \$4.98 billion

ANNUAL RETAIL MARKET IN THE U.S. FOR PLANT-BASED FOODS<sup>4</sup>

### PLANT-BASED MEAT

When asked which technologies would significantly improve human life in the near future, Eric Schmidt, executive chairman of Google's parent company Alphabet, named plant-based meat first. Schmidt cited the fact that plant-based meat uses significantly fewer resources than sourcing protein from industrial animal agriculture, reduces climate impact, and could lower the cost of food production in developing countries.

Plant-based meat offers a solution to the pressing concerns of food security and environmental protection.

This category represents an exciting opportunity to create high-paying jobs while diversifying and strengthening the protein market.<sup>5</sup>

Several major players in the food industry have recognized the enormous potential presented by plant-based meat. For instance, Tyson Foods, the largest meat producer in the United States, launched their own line of plant-based and blended products, and created a venture capital fund focused on alternative proteins, which has invested in multiple plant-based and cultivated meat companies. Smithfield, the world's largest pork processor, created a line of plant-based sausages, burgers, and meatballs under its Pure Farmland brand.

Right now, plant-based meat represents approximately 1% of sales for total retail meat in the United States,<sup>6</sup> but growth in this sector is accelerating rapidly and should only increase as plant-based companies create better, more convenient, and more affordable alternatives.<sup>7</sup> While market forces propel this industry, a lack of public funding allocated for basic research on plant biology to increase the quality and quantity of plant-based meat on the market prevents the industry from maximizing progress.

### CULTIVATED MEAT

As plant-based meat moves closer to taste and price parity with conventional meat, a new industry is harnessing food science to produce animal meat in a new way.

Cultivated meat (also called cell-based or cultured meat) is animal meat produced by growing cells from animals. At scale, cultivated meat production will look similar to the fermentation process in beer breweries. Production begins with a small sample of cells from an animal. The cells from this sample grow in a cultivator on a nutrient-rich cell culture medium.

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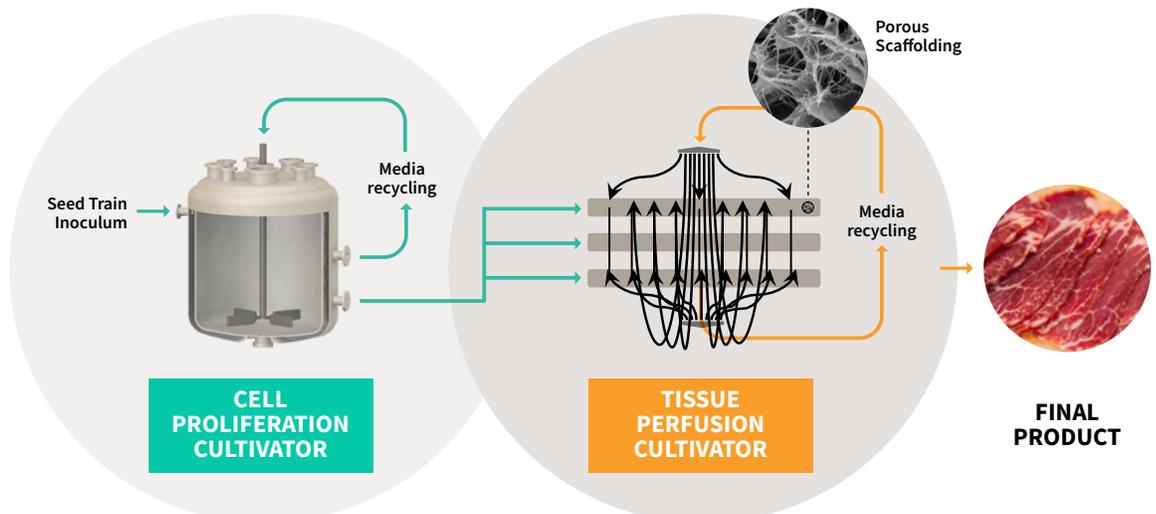




Photo credit: Wild Type

During cultivation, the cells multiply many times over, producing muscle, fat, and other components of meat. Additionally, some cultivated meat products are grown on scaffolds – biodegradable or edible structures made of food-grade materials – that support the development of a desirable texture. Like media ingredients, these materials are already widely used in the food industry, and their safety is well documented.<sup>8</sup>

The resulting meat looks, tastes, and cooks like conventional meat. By removing animals from the process, cultivated meat production offers a more efficient and sustainable process, avoids the use of antibiotics, and reduces the risk of foodborne illness. Companies have made a wide range of meats this way, but no one has yet scaled this process for mass

production or made cultivated meat cost-competitive with conventional meat. Conventional meat industry partners see the market opportunity for diversifying their protein production and have invested in cultivated meat companies. For example, Cargill, the United States’ largest privately-held company invested in cultivated meat companies Memphis Meats and Israeli start-up Aleph Farms, and Tyson Foods invested in both Memphis Meats and Israeli start-up Future Meat Technologies (FMT). Both Aleph and FMT were started by Israeli professors of tissue engineering.

When cultivated meat is ready to be sold in the United States, it will be regulated by both the U.S. Department of Agriculture (USDA) and the Food and Drug Administration (FDA). The FDA will take responsibility over production up to the point that the meat is harvested from the cultivator, and the USDA will oversee the processing and labeling of the meat. The FDA will exercise exclusive oversight of cell-based seafood products.<sup>9,10</sup> With this leadership at the federal level, consumers can be confident that cultivated meat will be safe, wholesome, and properly labeled.

Cultivated meat represents an exceptional opportunity to meet consumers’ protein needs while creating high-paying jobs and protecting our nation’s resources and health. By funding research and development, this opportunity can be realized and put our food system on a sustainable path.



Photo credit: Memphis Meats

## References:

1. Franck, Thomas. (2019, May 23). *Alternative meat to become \$140 billion industry in a decade, Barclays predicts*. CNBC. <https://www.cnn.com/2019/05/23/alternative-meat-to-become-140-billion-industry-barclays-says.html>
2. McKinsey & Company. (2019, October 28). *'It's our job to evolve with consumers': Tyson Foods on alternative protein*. <https://tinyurl.com/y7wr42k4>
3. Plant Based Foods Association. (2019, August 24). *Economics report: plant based foods industry creating high wage jobs*. <https://plantbasedfoods.org/plant-based-foods-industry-creating-high-wage-jobs/>
4. The Good Food Institute. (2020, May 7). *2019 U.S. State of the Industry Report: Plant-Based Meat, Eggs, and Dairy*. <https://rb.gy/8ry0lm>
5. The jobs created in the plant-based foods industry have an average income of \$59,300 – or about \$12,500 more than the average income in the United States. (Plant Based Foods Association. (2019, August 24). *Economics report: plant based foods industry creating high wage jobs*. <https://plantbasedfoods.org/plant-based-foods-industry-creating-high-wage-jobs/>.)
6. The Good Food Institute. (2020, May 7). *2019 U.S. State of the Industry Report: Plant-Based Meat, Eggs, and Dairy*. <https://rb.gy/8ry0lm>
7. SPINS does not report non-UPC meat counter sales. To account for this, the plant-based meat total retail share calculation uses the \$95 billion total meat market size reported by Nielsen, as this number includes both retail packaged meat sales and non-UPC meat counter sales.
8. While the fundamentals of the cultivation process are well established, public funding for further research is essential to more rapidly bring production costs down and address technical challenges related to commercial scale-up.
9. United States Department of Agriculture. (2019, March 7). *USDA and FDA announce a formal agreement to regulate cell-cultured food products from cell lines of livestock and poultry*. <https://www.usda.gov/media/press-releases/2019/03/07/usda-and-fda-announce-formal-agreement-regulate-cell-cultured-food>
10. All cultivated seafood will be regulated by FDA except cultivated catfish. Catfish production is regulated by USDA, which will also be true for cultivated catfish.

The Good Food Institute is a 501(c)(3) nonprofit dedicated to creating a healthy, sustainable, and just food supply. GFI's team of scientists, business analysts, and lawyers are available as a resource for any questions related to plant-based or cultivated meat. Learn more at [www.gfi.org](http://www.gfi.org).

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