OPEN-ACCESS RESEARCH IS NEEDED FOR PLANT-BASED AND CULTIVATED MEAT

PLANT-BASED MEAT is meat made from plants – like the Impossible Whopper, Beyond Burger, and Good Catch tuna. Although plant-based meat is generally not yet cost competitive with animal-based meat, it will get cheaper as companies reach economies of scale.

CULTIVATED MEAT is animal meat produced by growing cells from animals in tanks called cultivators.¹ Cultivated meat companies expect to launch in restaurants within the next few years.

PUBLICLY FUNDED RESEARCH ON ALTERNATIVE PROTEINS WILL BENEFIT THE AMERICAN ECONOMY, FOOD SECURITY, AND CONSUMERS

The best time to have invested in open-access research to accelerate progress on plant-based and cultivated meat would have been years ago. The second-best time is now. This research will pay significant dividends.

Boosting Economic Growth & Job Creation

- Public investment in research will stimulate economic growth and create jobs, including in rural communities. In the same way that publicly funded research after World War II boosted productivity and increased household income, public funding for research on plant-based and cultivated meat will prime the pump for dramatic improvements in the productivity of our food system and the growth of our economy.

Former Secretary of Agriculture Tom Vilsack has recognized the economic benefit of investing in public research: “Studies have shown that every dollar invested in agricultural research creates $20 in economic activity.”²

- New jobs and economic growth will occur throughout the alternative protein supply chain. Farmers will be needed to grow crops for plant-based and cultivated meat inputs, such as legumes, grains, and sugars. These otherwise inexpensive feedstocks can be sold at a higher value for alternative protein inputs than commodity prices for animal feed. In addition, a large number of skilled jobs including engineers, biologists, food scientists, nutritionists, and biochemists will be created, and new manufacturing plants will be required for the production of the necessary tools and equipment involved.

By 2030, the alternative protein industry can create 200,000 jobs.³

Ensuring Food Safety & Security

- Demand for meat is at an all-time high.⁴ However, our current meat production system is vulnerable to extreme weather, disease outbreaks, and the emergence of crop diseases and pests.

- Public research into alternative proteins will allow us to diversify the food supply, so that it is more resilient. For instance, plant-based and cultivated meat are completely insusceptible to zoonotic disease because they do not require the use of live animals.

- Public funding for alternative protein research will help fight the rise of antibiotic resistance which is slated to cost the global economy $100 trillion by 2050. By not using antibiotics as a routine aspect of production, a widespread shift from current production methods toward plant-based and cultivated meat production could avert this threat and save millions of lives per year.⁵

Expanding Consumer Choice

- Public research on alternative proteins will accelerate progress on production systems that will enable American farmers and other entrepreneurs to provide more choices to American consumers and export more food abroad.

- Plant-based meat production is flexible and can quickly adapt to changing consumer preferences. For example, the same peas used in plant-based burgers could be used in plant-based chicken or pork.

- The inputs for plant-based and cultivated meat can typically be stored until needed, allowing production to vary based on consumer demand and market conditions.
THE UNITED STATES IS AT RISK OF FALLING BEHIND OTHER COUNTRIES IF WE DO NOT INVEST IN CRITICAL RESEARCH NOW

The United States has a proud history of funding research that drives innovation. Government research enabled the development of numerous technologies that are essential to our daily lives, including the internet and GPS. Public funding of alternative protein science will help ensure continued U.S. leadership in innovation and global problem-solving.

Other countries are actively supporting the development of the plant-based and cultivated meat industries. For example, the European Union announced in July 2019 that it is directing approximately $15.7 million for plant protein research. The Netherlands spent $2.3 million on cultivated meat research from 2005 to 2009 and is currently spending $6.6 million on a five-year research project to improve plant-based meat manufacturing technology.

EARLY FEDERAL FUNDING HELPED SUPPORT DEVELOPMENT OF:

- Renewable energy (Department of Energy)
- LEDs (Air Force, Department of Energy)
- The Human Genome Project (National Institutes of Health, Department of Energy)
- The Internet (Defense Advanced Research Projects Agency)
- Google’s search engine (National Science Foundation)
- GPS (Department of Defense, Defense Advanced Research Projects Agency, National Institute of Standards and Technology)
- Supercomputers (National Labs)
- Siri, Speech recognition (Defense Advanced Research Projects Agency)10,11

CASE STUDY: USDA-FUNDED RESEARCH & BEYOND MEAT

USDA-funded research at the University of Missouri was the basis of the technology that’s used in Beyond Meat’s plant-based Beyond Burger to help it biomimic the texture of meat.6 Thanks to this foundational public research, Beyond Meat had the best-performing public offering by a major U.S. company in almost two decades when they went public in May 2019,7 and consumers on six continents can now buy Beyond Burgers in restaurants and supermarkets.8

As demand increases for Beyond Meat’s products, farmers will also reap the benefits of this USDA-funded research. Global demand for peas is expected to quadruple by 2025.9 Instead of selling crops for animal feed at commodity prices, farmers will have the option of selling inputs, like peas, for plant-based products at greater profit.
Some countries have taken an even bolder approach. For instance, Singapore has invested $144 million into a variety of next-generation technologies intended to bolster its bioeconomy, including cultivated meat. Canada, Germany, India, Israel, and Japan are making similar investments. American leadership in the alternative protein sector will suffer if we do not invest in research and development.

**PUBLIC RESEARCH PLAYS A DIFFERENT ROLE THAN PRIVATE INVESTMENT**

Public research on alternative proteins can be used by every single company and researcher in the alternative protein sector. This research will spur the creation of new companies, strengthen the United States’ economic competitiveness, inspire further research, and create new opportunities to feed Americans and the world.

In contrast, private research can only benefit the company that conducted the research. This research is often proprietary and duplicative, while the results of public research have a significantly broader impact.

**PUBLIC FUNDS SHOULD SUPPORT THESE RESEARCH PRIORITIES**

**PLANT-BASED MEAT**

- Characterize and optimize non-animal proteins to assess their suitability for use as ingredients.
- Develop techniques for making plant-based ingredients more functional and useful.
- Improve methods of plant-based food manufacturing.

**CULTIVATED MEAT**

- Develop stable animal cell lines.
- Optimize the function and cost of cell culture media.
- Explore novel methods of scaffolding.
- Modify cultivator designs for large-scale cell culture.
References:

1. Cultivated meat production begins with a small sample of cells from an animal. The cells from this sample are put in a closed sterile tank called a cultivator and fed a nutrient-rich cell culture medium. During cultivation, the cells multiply many times over, producing muscle, fat, and other components of meat. The resulting meat looks, tastes, and cooks just like conventional meat.


13. 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.

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.