Good Food Institute

The United States should prioritize public investment in alternative proteins

In the United States and around the world, demand for meat is at an all-time high and shows no sign of slowing down.[1] The United States spent most of the 20th century scaling up meat production, only to have a pandemic lay bare the limits of this system. We now have the opportunity to produce meat in a new way. A way that benefits the American economy, farm biosecurity, the climate, and consumers.

Just as policy has supported an array of other key R&D and infrastructure initiatives focused on climate change mitigation, biosecurity, and American competitiveness in the world, the United States should prioritize public investment in alternative proteins, which will diversify the protein supply for domestic consumption and export. A majority of U.S. voters polled in 2021 support funding for research on alternative proteins.[2] If we do not act now, other countries will seize the opportunity to lead.

Plant-based meat provides the taste and texture of conventional meat, but made from plants.

Cultivated meat is real animal meat — identical to conventional meat — cultivated directly from animal cells.

Most of the world's largest meat and food companies are producing plant-based meat as well as investing in cultivated meat startups. Using efficient production methods, both types of meat, at scale, should be cost-competitive with conventional meat.

Alternative protein research boosts economic growth

Public investment in research will stimulate economic growth and prime the pump for dramatic improvements in the productivity of our food system and the growth of our economy. Secretary of Agriculture, Tom Vilsack, has recognized the economic benefit of investing in public research stating, “Studies have shown that every dollar invested in agricultural research creates $20 in economic activity.”[3]

The entire supply chain will benefit — from the farmers growing crops to the people making meat. Additionally, it presents the opportunities to develop new inputs, manufacture equipment, engineer facilities, create recipes, and market the meat to consumers. Although still nascent, the plant-based foods industry has created more than 55,000 jobs in the United States.[4] At scale, the benefits will be even greater. Alternative meats can create hundreds of thousands of high-wage jobs, according to estimates from the Breakthrough Institute.[5]

Case study: USDA funded research and Beyond Meat

USDA-funded research at the University of Missouri was the basis of the technology used in Beyond Meat’s first products and helped form the foundation for the company’s ongoing approach to innovation.[6] Thanks to this public research, Beyond Meat had the best-performing public offering by a major U.S. company in almost two decades in May 2019, and consumers in 80 countries across six continents can now buy Beyond Meat in restaurants and supermarkets [7, 8]

As demand increases for Beyond Meat’s products, farmers will also reap the benefits of this public research. 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 a greater profit.[9]

Photograph courtesy of Beyond Meat

Ensure biosecurity and a resilient food system

Investing in alternative proteins will help make meat production more resilient to extreme weather, disease outbreaks, and the emergence of crop diseases and pests.[10] For instance, plant-based and cultivated meat are entirely insusceptible to animal diseases (e.g, bird flu, African swine fever, and mad cow disease), because they do not require the use of live animals.[11] This also means they are less likely to create another pandemic[12] and are less susceptible than other foods, including fish from aquaculture, to the growing threat of a biological attack.[13,14]

Public funding for alternative protein research will also help fight the rise of antibiotic resistance, which will otherwise cost the global economy $100 trillion by 2050.[15] Produced without routine antibiotics, plant-based and cultivated meat could help avert this threat and save millions of lives per year.

Production can vary based on consumer demand and market conditions because the inputs for plant-based and cultivated meat can typically be stored until needed. And plant-based meat production can quickly adapt to changing consumer preferences. For example, plant-based chicken or pork can use the same peas as plant-based burgers, allowing supply to dynamically adjust to demand.

Expand consumer choice

Plant-based burgers and nuggets are plentiful, but no whole-cut meats made from plants or animal cells are currently available in American supermarkets. Moreover, plant-based meats are primarily made from soy, wheat, or peas. Public research will accelerate progress to provide more options for consumers.

Almost all products on the market now are much more expensive than their conventional counterparts, and until products taste the same or better and cost the same or less, they are likely to stay niche. Investing in this sector will leverage economies of scale to bring prices down so that alternative proteins are accessible to all consumers.

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Ease agriculture's impact on the climate

Even if we halt all fossil fuel emissions, current global protein production alone will make meeting the Paris Agreement's 1.5°C target impossible. Alternative proteins can play a leading role in a global protein transition by significantly reducing emissions while freeing land for additional climate mitigation strategies, food security, and biodiversity.

A protein transition has the potential to deliver 14 to 20 percent of the emissions mitigation the world needs to stay below 1.5°C.[16] Plant-based meat emits 30 percent to 90 percent less greenhouse gas than conventional meat.[17] Plant-based and cultivated meats essentially electrify meat production.[18] Alternative proteins also spare land and reduce water pollution.[19,20]

2021 poll findings

In 2021, GFI commissioned ALG Research to poll Americans for their views on alternative proteins. Key findings include:

- Nearly half of voters have tried plant-based meat.
- A majority of voters support funding for research on alternative proteins.
- Alternative proteins are already viewed as more environmentally friendly than traditional proteins.
- Americans support alternative proteins in part due to concerns over food safety, the prevention of zoonotic diseases, and ensuring the United States is not reliant on food imports from China.[21]

Keep America first

The United States has a proud history of funding research to drive innovation, but we have only dipped our toe into alternative protein research:

- **USDA's National Institute of Food and Agriculture (NIFA)** awarded $10 million over five years to Tufts University, Virginia Tech, Virginia State, University of California-Davis, MIT, and University of Massachusetts Boston to establish the National Institute for Cellular Agriculture, a flagship American cultivated protein research center of excellence.[22]
- **USDA NIFA** issued two awards totaling just shy of $1 million over two years for research at the University of Massachusetts Amherst on plant-based meat production methods and Purdue University on pea protein functionality.[23]
- **The National Science Foundation** awarded $3.55 million in 2020 to a consortium of researchers at the University of California Davis to perform cultivated meat research over five years, marking the first federal investment in academic research on cultivated meat and a promising start to a new era in agricultural innovation.[24]

Other countries are actively supporting the development of the plant-based and cultivated meat industries. For example, the European Union includes alternative proteins as a key research area in Horizon Europe's $12 billion research and innovation program.[25] Singapore has invested $144 million into various next-generation technologies intended to bolster its bioeconomy, including cultivated meat.[26] Canada, Germany, India, Israel, Japan, and the Netherlands are making similar investments.

GFI's alternative protein Research Grants Tracker compiles publicly available information about non-dilutive alternative protein research funding. You can see the recipients, the size of the awards, and whether the results will be public.

Early federal funding helped support the 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)[27, 28]

American leadership in the alternative protein sector will suffer if we do not invest in research and development. The United States funded early research on electric vehicle batteries but failed to sustain a sizable investment. We have now fallen behind. China has 93 factories for lithium-ion battery production, to our four, at a time when car companies are pledging to transition their fleets to electric. **We have a similar opportunity with protein production, and the time to seize it is now.**

The Good Food Institute is a 501(c)(3) nonprofit dedicated to creating a sustainable, secure, and just food supply. GFI's team of scientists, business analysts, and policy experts are available to answer questions on plant-based, or cultivated meat. Learn more at gfi.org

Endnotes

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