Federal Support for Alternative Protein for Economic Recovery and Climate Mitigation

BREAKTHROUGH INSTITUTE

Summary

- The United States is a key innovator and producer of alternative proteins in a globally competitive sector, whose rapid growth in recent years offers significant promise for reducing agriculture's carbon emissions. However, the COVID-19 crisis threatens to wipe out the nascent industry's advances. With food service outlets shut down, sales are declining, and the economic downturn is threatening the industry's funding for R&D and expansion.

- Federal investment in the alternative protein industry would help ensure that the industry, which could generate over 200,000 jobs in the long-term, does not collapse and continues to innovate and grow.

- To support continued R&D, which is essential to the industry's growth, Congress could create an interagency R&D program and increase Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) funding.

- To address the drop in financing for large company expansions and investments, USDA could guarantee on the order of $200 million in loans for alternative protein companies.

"This is a critical moment for the alternative protein industry, a potentially powerful force in the fight against climate change and the future of the American economy. Robust federal support can assist the broader recovery effort and help the industry realize its potential."

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The United States has been a world leader in the nascent alternative protein sector, which has quickly produced innovative, high-demand foods with lower carbon emissions than animal protein sources, while avoiding risk of zoonotic disease. These foods include meat and dairy products made from plants, fungi or mycoprotein, insects, algae, fermentation, and cultivated ("lab-grown" or "cell-based") meat.

However, the COVID-19 pandemic and its induced economic downturn is threatening to wipe out the advances of the industry during an inflection point, when many companies are raising funds, launching production capacity, developing new products, or deploying them to market. Although the animal livestock industry has been at the center of the crisis' negative impacts and sales of some plant-based meat products are thriving in grocery stores, the alternative protein industry is far from secure:

- Companies are losing a key revenue source as food service outlets close or severely decrease sales. Further, some companies have closed production facilities to mitigate potential risks from COVID-19, and many that rely on ingredients or inputs that are scarce or sourced from abroad face supply chain disruptions and price fluctuations.[1]

- Due to the need for social distancing, startups and producers are facing restricted access to laboratories needed to bring their products to market or to improve products that are already being sold. Shortages of research equipment have forced project timelines to be pushed back until orders can be completed. Some companies may lack the capital to weather this and may find themselves needing to sell their equipment to raise funds.[2]

- The economic crisis will likely lead to losses in venture capital (VC) funding and private equity, which the industry has depended on to finance R&D and commercialization. VC investment in alternative protein startups could fall about $300 million globally in 2020, if funding falls as much as it has for all startups in the first quarter of 2020.[3,4]

Robust federal investment in alternative protein R&D and production would offer significant economic and environmental benefits. The plant-based food industry alone supports more than 60,000 higher-than-average paying jobs, providing $3.6 billion in income each year, in at least 35 different states.[5,6] And the industry has been in the midst of rapid growth. If consumer demand and research developments continue, by 2030 the market could grow nearly ten-fold,[7,8] generating nearly 200,000 jobs in the US.[9,10] Likewise, continued innovation and price reductions in alternative proteins could substantially cut US greenhouse gas emissions related to livestock production — at least 20%[11] — while mitigating or eliminating issues related to animal welfare, zoonotic disease risk, tropical deforestation, and microbial contamination.[12,13]

INTERAGENCY RESEARCH INITIATIVE TO SUPPORT CONTINUED R&D

Total spend: *$50 milion*
Near-term job creation: *600 - 800*

To ensure that the US alternative protein industry continues to innovate, remain internationally competitive, and ultimately grow and create new jobs, the federal government could support a wide range of R&D efforts.

Given that multiple agencies and disciplines are involved in alternative protein R&D, Congress could create an interagency R&D initiative, similar to the National Nanotechnology Initiative which helped create hundreds of thousands of jobs.[14] The new initiative would coordinate activities across the US Department of Agriculture (USDA), the National Science Foundation (NSF), the National Institutes of Health (NIH), and other agencies. The Office of Science and Technology Policy (OSTP), for instance, could coordinate

efforts without new funding, but would best address the current reduction in R&D activities and private sector funding with additional funding on the order of $50 million.

This interagency coordination would improve administrative efficiency, create 600-800 jobs in the near-term,[15] and accelerate commercialization of alternative protein technologies that are projected to lead to hundreds of thousands of jobs and help position the US as a global leader in the growing industry.

FUNDING FOR SMALL BUSINESS INNOVATION PROGRAMS

Total spend: *$10 million*
Near-term job creation: *100 - 200*

To stimulate private sector R&D in particular, Congress could provide a large one-time funding increase on the order of $10 million for the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs across USDA. SBIR and STTR allows qualifying small businesses to engage in research and technological innovation with the potential of commercialization. Under these programs, alternative protein startups could submit applications for developing new products, manufacturing technologies, and sources of protein. In fact, in 1998, a SBIR grant funded through NASA helped to pioneer cultivated meat production and influenced the development of the first cultivated meat burger.[16]

SBIR and STTR programs encourage public-private collaboration, attract private investment, stimulate scientific and technological advances, and create new jobs. STTR requires a small business to team up with a research institution, while the principal investigator for an SBIR project must be employed by the small business, with the option to include subcontractors like research institutions. Further, these programs have an impressive track record. 40-70% of projects funded by different agencies' SBIR programs report reaching the market under the SBIR program, generating a high ROI — upwards of $19.5 in economic activity per $1 invested for some agencies.[17] While increasing funding would quickly create about 100-200 jobs,[18] research support is necessary to ensure that the industry makes crucial advancements that create hundreds of thousands of jobs over the long term.

FEDERAL LOAN GUARANTEES TO EXPAND PRODUCTION CAPACITIES

Total spend: *$13.3 million*
Near-term job creation: *2,200 - 3,200*

To address the large decline in financing that established companies face, which prevents them from investing in expansions and other large investments, USDA could develop a loan guarantee program.

Federal loan guarantees help borrowers, like alternative protein companies and startups, receive privately-financed loans by having the government assume the risk of the borrower's debt obligation. They are particularly effective in increasing the amount of loans given to companies using new technologies, such as many alternative protein startups, which lenders otherwise consider too risky to lend to.[19] By stimulating growth in nascent industries, loan guarantee programs can also have outsized economic impacts. Coming out of the financial crisis of 2008-2009, the Department of Energy guaranteed $15.7 billion in loans which bridged the financing gap for the first utility-scale solar PV projects, supported 250,000 jobs, attracted $9.3 billion in private equity, and reduced the cost of renewable electricity generation by about 20%.[20,21,22]

With a low level of funding, USDA could guarantee enough loans — on the order of $200 million — to

close the financing gap for promising alternative protein companies aiming to expand. This level of loan could be guaranteed with just $13.3 million in appropriations, assuming administrative costs and default rates are similar to those of USDA's rural energy loan guarantee program.[23] It would generate on the order of 2,200-3,200 jobs related to food manufacturing in the near-term.[24] While the alternative protein industry has seen particularly rapid growth and is thus a good target for support, the loan guarantee program could be expanded to support other food- and ag-tech industries.

This is a critical moment for the alternative protein industry. Its recent growth promises the arrival of a powerful force in the American economy, which offers valuable tools in the fight against climate change. But the industry is not yet firmly established, and its growth is menaced by the public health and economic crises. Amidst this uncertainty, robust federal support can assist the broader recovery effort and help the industry realize its potential.

ENDNOTES

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2 As discussed in the Good Food Institute's (GFI) April 17th submission to the House Committee on Science, Space, & Technology.

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5 4.The Plant Based Foods Industry Contribution to the U.S. Economy | Plant Based Foods Association. Plant Based Foods Association (2020). Available at: <https://plantbasedfoods.org/the-plant-based-foods-industry-contribution-to-the-u-s-economy/>

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9 Assumes 20% of global industry growth occurs in the US, based on North America currently accounting for 20% of global plant protein sales. Assumes the relationship between jobs and the plant-based food industry market value from 2016 (1 job per $80,886 dollars) holds true for 2030.

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13 Managing environmental risks in meat and dairy supply chains | FAIRR. FAIRR (2020). at <https://www.fairr.org/article/managing-environmental-risks-in-meat-and-dairy-supply-chains/>

14 Roco, M.C. The long view of nanotechnology development: the National Nanotechnology Initiative at 10 years. J Nanopart Res 13, 427-445 (2011). https://doi.org/10.1007/s11051-010-0192-z

15 Lower and upper estimates derived from jobs multipliers, including direct and indirect jobs, for "Scientific research and development services" and "Management, scientific, and technical consulting services", respectively. <https://www.epi.org/files/pdf/160282.pdf>

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