



FROM THE  
ground *up*

2023 YEAR IN REVIEW



# Reimagining protein, *from the ground up*

It's amazing how much can happen in a short time.

Ten years ago, Dr. Mark Post cooked up the world's first cultivated meat burger, and the estimated cost to make it was \$330,000. At that time, plant-based burgers designed to replicate the taste and texture of their animal counterparts were largely absent from menus and grocery store shelves. Today, real animal meat made without animals can be sold in the world's largest economy, and you can find plant-based meat on plates across the globe.

More significant change is needed, on a global scale and at a rapid pace, to transform our food system into one that feeds more people with fewer resources, reduces emissions, and sustains human and planetary health for generations to come. Today, alternative proteins hold a tiny fraction of the global market, while demand for meat is projected to increase by at least 50 percent by 2050. Reimagining protein production—with speed and determination—is essential.

We need more scientists, students, companies, nonprofits, philanthropists, and governments to drive this change. As a nonprofit and global network of organizations, GFI works across science, policy, and industry to accelerate alternative protein innovation, bring more people into the field, and create pathways to mainstream adoption that are made for this moment.

Our 2023 Year in Review spotlights stories of the people and partnerships creating alternative protein progress from the ground up—all made possible by a donor community that has been our foundation since the beginning. We hope you take a moment to be inspired by all of the change that has taken place and the much greater change we can make possible together.

With deep gratitude and relentless optimism,

## GFI's global leadership team

### **Bruce Friedrich**

founder and president

### **Mirte Gosker**

GFI Asia Pacific managing director

### **Gus Guadagnini**

GFI Brazil CEO

### **Alex Mayers**

GFI Europe managing director

### **Sneha Singh**

GFI India acting managing director

### **Nir Goldstein**

GFI Israel CEO

### **Ilya Sheyman**

GFI U.S. CEO

### **Jessica Almy**

senior vice president of policy

### **Chethana Biliyar**

vice president of operations

### **Caroline Bushnell**

senior vice president of corporate engagement

### **Sarah David**

general counsel

### **Susan Halteman**

senior vice president of development

### **Liz Specht, PhD**

senior vice president of science and technology

### **Sheila Voss**

senior vice president of communications

# *Your guide to our 2023*

## Building blocks

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Photo credit: Tender Food

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All of our work is possible thanks to the support of our global community of donors.

# Six organizations in one: *our global network*

At GFI, we envision a food system that feeds 10 billion people while meeting global climate goals, protecting biodiversity, and maximizing public health. GFI operates in regions of the world with the greatest potential to advance the alternative protein ecosystem.



Providing enormous production opportunities and governments interested in food innovation, Asia Pacific is a fast-growing region for alternative proteins.



With two of the five major meat companies in the world and a government willing to invest in agricultural research, Brazil has the potential to become an alternative protein hub.



Hosting top research universities and governments making bold investments in research, Europe is a promising region for alternative protein development.



Offering a deep scientific talent pool and a government committed to finding opportunities for farmers, India has a growing capacity for alternative protein innovation and manufacturing.





## gfi<sup>®</sup> (United States)

Home to three of the five largest meat companies and the world's largest economy, the United States has a strong influence on the global policy landscape for alternative proteins.

## gfi<sub>Israel</sub>

The “startup nation” boasts world-class academic institutions and a culture that champions innovation, providing a supportive environment for alternative protein research.

## Our theory of change

Just as the world is changing how energy is produced and cars are powered, we must reimagine how protein is made. GFI is driven by a bold idea:

**If we ensure that alternative proteins taste the same or better and cost the same or less than conventional meat while providing equivalent or better nutrition, we can usher in a more sustainable and just food future.**

As an international network of nonprofit think tanks, GFI is a field catalyst for the alternative protein sector. Working across science, policy, and industry, we are developing the roadmap for a stronger and more equitable protein supply.

# *Accelerating public investment*

## **“Global demand for meat is at an all-time high,”**

said Sanah Baig, Deputy Under Secretary at the USDA, speaking at the launch of the Center for Strategic and International Studies report on alternative proteins (read more on page 21). “Protein production will need to be doubled by 2050 in order to feed our growing population, and we simply cannot do this by maintaining our status quo production systems.”

Global food systems must adapt to feed an expanding world, but change won’t happen at the pace we need without government investment. From informing national-level strategies to developing regulatory frameworks, GFI’s policy teams are accelerating a global shift toward alternative proteins. We are drawing

connections between alternative proteins and some of the biggest challenges that governments need to solve—from climate change to food security and public health.

## **Shaping the protein transition in Europe**

With many European policymakers just beginning to explore alternative proteins, GFI Europe’s detailed, country-specific insights are essential to shaping the future of alternative proteins. In Germany, Europe’s largest market for plant-based meat, we launched the first State of the Industry Report on the German alternative protein ecosystem (read more on page 19) and engaged with the Bioeconomy Council, a key advisor to the German government on sustainable resource use. Our work to inform German

policymakers about the potential of alternative proteins achieved a major victory when the German parliament paved the way for a €30 million investment in the protein transition.

GFI Europe is also working closely with the European Commission’s EU Protein Strategy, an initiative launched to diversify protein production and decrease reliance on imported feed. Our policy team helped shape a European Parliament report intended to guide the strategy, successfully removing one provision that could delay cultivated meat coming to market. The Parliament report also shared several of our policy priorities, including public investment in research and technical support for companies seeking regulatory approval. In 2024, we’re continuing to work closely with policymakers to ensure these priorities are incorporated into the final EU Protein Strategy.





*Ivo Rzegotta, GFI Europe senior public affairs manager for Germany, speaks at a policy breakfast co-organized by GFI for staffers from the German parliament and four federal ministries.*

**“[The] fundamental building blocks of how you grow meat outside of an animal would benefit from public investment and open access to the research.”**

– Jessica Almy, GFI senior vice president of policy in *Inc.*

*The White House Office of Science and Technology Policy’s Bold Goals report identified alternative proteins as a key theme of the future of biotechnology.*



## Unlocking public investment and support

A report co-funded by the UK’s Foreign, Commonwealth & Development Office estimates that the world’s governments must collectively invest \$10.1 billion per year in alternative proteins to feed and sustain the planet’s growing population.

In the United States, GFI is advancing government investment in alternative protein research. In March 2023, President Biden’s administration released the “Bold Goals for U.S. Biotechnology and Biomanufacturing” report, outlining a strategic vision for the American bioeconomy. Both the Department of Agriculture and the Department of Energy took steps to achieve the report’s vision: the USDA co-hosted events with GFI during AIM for Climate and Climate Week NYC and joined us at our Good Food Conference (read more on page 22), while the Department of Energy issued a new \$83 million funding opportunity to support sustainable technologies, including alternative protein production as a specific area of interest.



*GFI’s U.S. policy team celebrates the regulatory clearance of cultivated meat.*

## Ensuring fair regulatory pathways around the world

After championing the regulatory clearance and market entry of cultivated meat for years, in June 2023, GFI celebrated two cultivated meat companies clearing the final regulatory hurdle to sell their chicken in the United States.

Our perspective on this landmark moment for the industry was included in most top media stories covering the news, from CNN and NPR to *TIME* and the *New York Times*.



Above: Cultivated chicken  
Photo credit: UPSIDE Foods

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**“Consumers are now one giant step closer to enjoying the meat they love without compromise.”**

—GFI president and founder Bruce Friedrich,  
NPR’s *All Things Considered*

If we hope to see alternative protein regulatory progress replicated around the world, there is challenging work ahead. Since 2019, GFI Brazil has been developing a regulatory framework to support the market entry and fair sale of alternative proteins in Brazil. We began by commissioning three studies on the Brazilian market that encompassed multiple categories of alternative protein products, outlining existing regulations and areas that require revision. Leveraging these insights and our expertise on Brazil’s policy landscape, we organized monthly working group meetings where top food companies provided input on the framework development process.

In 2023, our cultivated meat and fermentation-derived frameworks were officially published by the Brazilian government, signaling an important step toward adoption and implementation.

Throughout the Asia Pacific region, there’s an increased interest in cultivated meat as a way to create a more secure and sustainable protein supply—and demand for consistent regulations across the region is growing. In response, GFI APAC and the APAC Society for Cellular Agriculture created the APAC Regulatory Coordination Forum, which facilitates discussions between companies, industry groups, think tanks, government agencies, and food regulators. At the forum’s launch, signatories from nine countries across the region endorsed a memorandum of understanding to align on approval processes for alternative proteins. GFI policy specialist Ankur Kumar Chaudhary shared, “By collaborating across borders and sharing knowledge, we can create a level playing field and build clear pathways for cultivated meat to come to market.”

## Advancing economic growth

GFI India has worked for years to establish partnerships with government bodies and highlight alternative proteins as a core



piece of advancing India's economic growth—and in 2023, we achieved a significant milestone. After meeting repeatedly with the government's senior science staff, sharing resources on the benefits of alternative proteins, and organizing strategic policy discussions, our persistence was rewarded when the Indian government announced that alternative proteins would be included as one of six priorities under the National Biomanufacturing Policy. Our work with the Ministry also led to the creation of an alternative protein-focused committee and four specialized working groups, and GFI India was selected to be included in all of these. In 2024, we will continue to work alongside the Ministry to amplify alternative proteins as a primary focus area for boosting the Indian economy.

## We believe change is possible.

The challenges presented by our global food system are also opportunities to build a better future for our planet and all who call it home. By championing government investment in alternative proteins and ensuring fair regulation, we are initiating a planet-saving shift that can only happen with transformational support. ▲

**“While the size of philanthropic funding may seem insignificant next to other sources, it often has the ability to take risks that others can’t.”**

— Director at Rumah Foundation and GFI donor Kathlyn Tan,  
*The Business Times*

## *The role of gifts and grants*

Because GFI is a nonprofit think tank, gifts and grants make all of our work possible. Donations have a powerful ripple effect, unlocking early breakthroughs and greater investment from governments. While private investment can benefit individual companies, gifts and grants power the entire sector with open-access data, insights, and research.

We need gifts and grants to lead the way because industry can't act quickly enough to create the

global change we need. Publicly funded researchers can focus on areas that private investors wouldn't, investigating research questions that may not immediately generate revenue but can provide insights that will help the sector reimagine protein.

Funding for GFI's Research Grant Program (read more on page 16) is an example of how gift support for GFI kickstarts innovation that can spur follow-on funding: In 2022, GFI grantees who secured follow-on funding turned our initial grants of \$1.8 million into \$16.9 million of additional government research funds, effectively creating a ninefold multiplying effect.

## *SPOTLIGHT*

### *Making cultivated meat halal*

Halal consumers represent about 25 percent of people worldwide, and for cultivated meat to arrive on dinner tables globally, we must make sure that everyone can take a bite. In 2023, GFI APAC laid the groundwork for halal approval of cultivated meat in markets across the world's most populous region. After our industry-wide survey identified the desire for clear religious certification procedures, we shared technical presentations and industry insights for halal certification leaders. When Shariah scholars in Saudi Arabia provided guidance on how to make cultivated meat halal, GFI APAC managing director Mirte Gosker noted in the *Financial Times* that the ruling provides “much-needed insight on what an approval road map might look like, and we expect that startups will immediately begin adapting their production processes to satisfy this new guidance.”

# *Growing the alternative protein industry*

**“There’s a lot of innovation yet to come,”**

predicted Elizabeth Gutschenritter, Managing Director of Alternative Proteins at Cargill, at GFI’s Good Food Conference (GFC). Hosted in September in San Francisco, our signature event featured bold visions and priorities for the future of alternative proteins during panels, workshop-style discussions, community meet-ups, and more.

The GFC brought together more than 1,200 attendees united around building a more sustainable future of food. Some of the largest meat and food companies in the world—including conference sponsors ADM, Cargill, CP Foods, and Givaudan/MISTA—seized this opportunity to emphasize the importance of alternative proteins to the conventional meat industry. Greg Dodson of ADM captured this enthusiasm:

**“It’s exciting to be able to develop and grow a new category to provide protein solutions. We believe that consumers need more choices for eating healthier, and it doesn’t have to be this all-or-nothing approach.”**



**3,250**

Members of the GFIdeas community, a global network for entrepreneurs, scientists, students, and subject matter experts who are driving alternative protein innovation

*Above: The 2023 Good Food Conference held in San Francisco was GFI’s largest in-person gathering to date.*

*Left: Participants at the 2023 Good Food Conference enjoyed delicious meals and snacks made from alternative proteins, praising their variety and innovation as a highlight of the conference.*





Seizing the biggest opportunities and addressing the most acute challenges were core themes across the GFC. Members of the U.S. Congress, representatives of the Departments of Agriculture and Energy, and state elected officials spoke about the importance of government investment in alternative protein research and development. During the opening session, California Assemblymember Ash Kalra shared, “If you look at the electric vehicle industry, it would not exist the way it does right now without California investing billions of dollars to encourage not just the research but individual market decisions. [...] That’s where we have to go with alternative proteins.”

Through technical presentations from leading researchers, in-depth conversations with global changemakers, a pitch slam for new alternative protein companies, and mouth-watering culinary experiences, the 2023 Good Food Conference brought together leaders from across sectors, serving as a timely reminder of a core GFI value needed for alternative protein progress: inviting everyone to the table.

## GFI connects and empowers the alternative protein industry

Another one of our core values at GFI is sharing knowledge freely. Our insights can be used by the entire field, expanding the alternative protein community and empowering leaders. One key example of this work is our Business of Alt Protein monthly webinars, expert-led sessions that explore how to build successful companies. Featuring speakers from industry giants like Kraft Heinz, government officials, investors, and more, seminars cover topics ranging from industry partnerships to navigating the complexities of the U.S. Food and Drug Administration’s evaluation programs. For an even more specialized deep dive into the alternative protein landscape, GFI LINC—short for Learn, Inspire, Network, Collaborate—brings together major food manufacturers, B2B suppliers, retailers, and food service companies for focused discussions on opportunities across the sector.

## Making public–private connections

While public sector funding opportunities are available for the alternative protein industry, many companies are not aware of them or are unsure how to navigate the application processes. As a nonprofit with strong relationships across the public and private sectors, GFI shares guidance to ensure that companies can find the information they need to access transformational funding. We work with the U.S. Department of Energy (DOE) and empower alternative protein champions in Congress to share these opportunities, highlighting the link between alternative proteins and the DOE’s work to decarbonize the food and beverage sector.

In September 2023, we collaborated with Rep. Julia Brownley’s office to host a webinar on using the DOE’s Loan Guarantee Program, which offers loans ranging from \$100 million to \$1 billion. One webinar participant shared: “As vital as this program may prove to be to alternative protein companies as they expand, we might not have become aware of it without GFI’s efforts, nor would we appreciate the program’s nuances without GFI’s sourcing of experts who so thoroughly understand it.” — Mark Langley, managing partner at Unovis Asset Management

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**“If we want the United States to be the leader in the development of alternative proteins, we’ll need even more investment.”**

– Rep. Julia Brownley speaking at GFI’s webinar with the Department of Energy



*GFI India's Smart Protein Innovation Challenge convened participants from across the country.*

## Growing future industry leaders

Every day, scientists and entrepreneurs are introduced to the promise of alternative proteins—but without mentorship, support, and training, these future leaders might never have the chance to make their mark on the future of food.

This idea is the driving force behind GFI India's flagship training program and competition, the India Smart Protein Innovation Challenge. Supporting startups and addressing the shortage of skilled professionals across the sector, the five-month Challenge gave more than 200 innovators from 80

Indian cities access to essential resources and mentorship in 2023. In honor of the International Year of Millets, the 2023 Challenge encouraged innovators to explore the opportunities offered by indigenous ingredients in alternative protein production. In the words of participant PR Durga Devi, "The guidance and mentorship provided throughout the Challenge were invaluable in refining my project. It was an exhilarating experience that opened doors to a world of opportunities."

The exponential impact of alternative protein mentorship also inspired GFI's Entrepreneur in Residence (EIR) program, a new initiative supporting innovators with team-building, market research, funding, and forming industry partnerships. After receiving more than 130 applications for our inaugural EIR, we selected Deimena Drasutyte, founder of HERlab, a startup specializing in precision fermentation. Deimena received tailored support from GFI over the nine-month program, resulting in HERlab securing more than \$830,000 in grant funding from Innovate UK, gaining lab space at

the University of Kent, expanding their team, and establishing an advisory board. By opening doors for breakthrough research and innovation, the EIR goes beyond benefiting individual teams, offering the potential to unlock progress for many companies in the industry.

## Upskilling the workforce across APAC and beyond

While there is a growing interest in the alternative protein sector in Asia, major gaps still exist in sourcing skilled talent. In response to this need, six companies and organizations joined GFI APAC in July 2023 to develop a training program aimed at recent graduates and mid-career professionals. Participants will have the chance to prepare for three main job roles within Singapore's plant-based meat industry and engage in hands-on training opportunities. The program provides a template for training local workers to staff R&D and manufacturing facilities across different regions and alternative protein categories.



## Our field-shaping resources are available to all

To ensure that all companies can benefit from our research, GFI's resources are 100 percent open-access. Our State of the Industry reports offer the world's most comprehensive and authoritative analyses of the alternative protein landscape—and, like the rest of our reports, they are free and available to all. In 2023, we released the first-ever Japanese translation of these global reports, and GFI India and GFI APAC launched inaugural State of the Industry reports in their respective regions.

Our retail market insights are similarly the go-to source on the market size and growth of plant-based foods. Before 2023, there was very little open-access data available on the plant-based market in Europe—until April, when GFI Europe released a region-specific report analyzing data across 13 European countries, which shows that sales of plant-based foods grew by 21 percent over two years to reach a record €5.8 billion. The findings in the report provide insights to equip companies with the data they need to grow the sector.

**“I could not recommend the program more and I feel extremely lucky being chosen for it. One sentence for the future EIR: You came on a bike – GFI is about to give you a rocket.”**

– Deimena Drašutytė, GFI's inaugural entrepreneur in residence

## Spreading knowledge across the ecosystem

The year 2023 brought significant milestones for alternative proteins, but there is a long road ahead before they can deliver on their world-changing promise. With all of the opportunities and challenges emerging for the sector, open-access resources that elevate the entire space matter now more than ever.

GFI's publications and programs—from our in-depth industry reports and technical analyses to our signature events and cross-sector convenings—are spurring alternative protein innovation, accelerating breakthroughs, and unlocking collaboration that wouldn't have otherwise been possible. ▲

## *SPOTLIGHT*

### *Driving consumer acceptance for a promising category*


For consumers to branch out and try new products, it's important that they have a clear understanding of what they're putting in their grocery cart. Scientists are looking to precision fermentation—which uses microorganisms to produce enzymes, flavoring agents, vitamins, natural pigments, and fats—to produce proteins that taste the same or better than conventional products. In 2023, GFI Europe commissioned extensive research across France, Germany, Spain, the United Kingdom, and the United States to understand how people perceive foods made using precision fermentation and the best ways of naming and describing them. GFI plans to share this globally relevant research and collaborate with startups to implement our findings, ensuring these insights inform their strategies to increase consumer acceptance.



# *Our global pillars*

## Working toward one vision

GFI is six organizations around the world united by a shared vision: a world where alternative proteins are no longer alternative. Our strategic pillars provide a global framework for collaboration, accountability, and transparency to maximize our impact.



**“There’s a lot more focus on food in the environment and sustainability agenda and that’s something that needs to be taken advantage of.”**

—Andy Jarvis, Director of Future of Food, Bezos Earth Fund



## Pillar 1

### GFI fosters a strong open-access alternative protein research and training ecosystem

GFI's science and technology teams identify and resource the most critical roadblocks to taste, price, and nutritional parity with conventional protein. In 2023, we grew the Alt Protein Project to 53 chapters worldwide, unlocked funding for plant-based and cultivated meat research and development, expanded the talent pipeline by convening and training future leaders, published 42 open-access analyses and resources, and partnered with governments to ensure public funding is directed at the most critical challenges in the field. (Read more on pages 15-18.)

## Pillar 2

### GFI influences the public sector to invest in alternative proteins

GFI's policy teams advocate for public investment in alternative protein research and development, fairness in the regulatory sphere, and freedom to use language consumers understand on product labels. In 2023, we secured public investment in alternative protein research globally, celebrated the culmination of years of advocacy when the USDA greenlit the sale of cultivated meat, and launched a new platform for aligning on novel food regulations across the Asia Pacific region. (Read more on pages 5-8.)

## Pillar 3

### GFI influences the private sector to prioritize alternative proteins

GFI's corporate engagement teams work across the private sector to advance alternative protein innovation and investment. In 2023, we engaged top global industry leaders, collaborated with the U.S. Department of Energy on public-private partnership opportunity projects, increased access to market research, conducted consumer perception studies in Asia and across other regions, organized webinars and roundtables, and hosted our largest conference to date with more than 1,200 innovators, scientists, policymakers, and industry leaders attending from around the world. (Read more on pages 9-12.)

**“Our current global food system, which relies heavily on animal agriculture, is unsustainable. We are already witnessing the consequences of our food choices which have contributed to climate change and the degradation of our waterways. We support GFI’s work because we believe innovative food solutions and technologies will pave the way to a better tomorrow for both humans and animals.”**

– John & Michele Cielukowski, GFI donors

*Left: A chef plates cultivated chicken at Climate Week NYC.*



Stay up-to-date on our progress toward each of these objectives by signing up for GFI's monthly reports at [gfi.org/newsletters](https://gfi.org/newsletters).

# *Building the scientific ecosystem*

**“Through the Alt Protein Project, we launched Stanford’s first alternative protein course, reaching over 150 students every year,”**

shared Elena Press, the Stanford Alt Protein Project’s president and co-founder. “One former student told me, ‘I took your course, and it inspired me to found my startup.’” Elena was part of the team that piloted the first-of-its-kind, overenrolled Rethinking Meat course at Stanford, which celebrated its third year in 2023. This course, and many others at top universities around the world, would not have been possible without GFI’s Alt Protein Project.

The Alt Protein Project (APP) is a global initiative designed to transform universities into engines for alternative protein education

and research. The APP has grown rapidly in the three short years since its inception, expanding from a handful of pilot universities in 2020 to more than 50 universities in 18 countries today. Past and current APP groups have spurred alternative protein research, held events and tastings to grow excitement around food innovation, and created new educational materials. With five alternative protein courses implemented by APP students in the last year alone, the nearly 600 active chapter members worldwide are inspiring the next generation to pursue careers in alternative protein science, research, and entrepreneurship.



# 13

Research projects receiving GFI grants in 2023



*Participants connected directly with scientists and students in the 2023 Good Food Conference exhibit hall, where more than 30 research projects were on display, representing the latest advancements in alternative protein science and innovation.*





The APP broke new ground for the 2023 cohort: we received more than 50 applications from around the world and were thrilled to welcome

**24 new groups  
across 11 countries**

## Our Research Grant Program fosters scientific breakthroughs

The alternative protein industry relies on research, and it will not grow at the pace and scale we need with private research that only benefits a few companies. That's why GFI's Research Grant Program (RGP) funds the first stage of open-access alternative

protein R&D, identifying the most urgent unanswered questions and prioritizing research needed to benefit every innovator in the ecosystem. The RGP provides proof of concept for later support and ensures insights are available to all.

For the RGP's fifth cohort, GFI experts evaluated open research questions through our rigorous scientific analyses (read more on page 19) and gained insights from the scientific community through events like our Science of Alt Protein

and Cultivated Meat Collaborative seminar series (read more on page 24). We invited scientists to submit proposals for projects that advanced the science of alternative proteins in four priority topic areas, receiving 197 proposals from 37 countries. The total funding request for these proposals was \$54.7 million, significantly exceeding what we can support alone and underscoring the need for governments worldwide to scale up their funding of alternative protein research.

## Championing alternative protein science to government leaders

"We are considering smart protein—not just to target malnutrition, but also to tackle climate impacts and improve food security," said Dr. Niloo Srivastava of India's Ministry of Science & Technology. The benefits of alternative proteins were featured throughout Dr. Srivastava's inaugural address at GFI India's Smart Protein Forum, an initiative convening experts committed to making India a global hub for alternative protein innovation. The Smart Protein Forum educates and connects these

## *Alternative proteins by any other name*

While clear and consistent nomenclature for alternative proteins is important, the preferred names for meat grown from plants or cultivated from cells can vary across regions. This is why you might see alternative protein initiatives or projects around the world referenced with terms like “sustainable protein” or “smart protein” that are particularly meaningful in their local contexts. As the alternative protein sector grows, its nomenclature will also continue to evolve.



influential leaders through in-depth panel discussions, site visits, food tastings, and more. At the end of Dr. Srivastava's address at the second forum meeting, she announced the formation of a Sectorial Committee for Smart Protein under the government's biomanufacturing initiative (read more on page 7), where we will continue to work alongside the government to build a roadmap for accelerating alternative protein science.

## Sharing our food safety expertise

To ensure that companies, policymakers, and consumers have the information they need to make decisions about alternative proteins,

GFI works with global leaders to share knowledge on the food safety of plant-based and cultivated meat. In 2023, GFI team members in Brazil and the United States served as expert consultants and provided technical reviews for the Food and Agriculture Organization of the United Nations (FAO) report on the food safety of cultivated meat. Thanks to GFI's expertise and our established relationship with the FAO, GFI Brazil scitech specialist Dr. Grazielle Bovi was invited to participate in their Foresight Technical Meeting on New Foods and Production Systems in November 2023. This gave us a leading voice in discussions about plant-based food manufacturing, precision fermentation, and using

3D printing in food production, solidifying our position as a global authority on food safety.

## GFI co-launches an academic research center

“[T]o bring about breakthroughs requires the investment of many years in research, many brilliant minds and millions of dollars,” shared GFI Israel director of science and technology Dr. Michal Halpert in *The Jerusalem Post*, “and the Technion does exactly that.” In January 2023, GFI Israel partnered with the Technion-Israel Institute of Technology, a leading Israeli research university, to launch the

*Above: Cultivated lamb tacos  
Photo credit: Magic Valley*

Sustainable Protein Research Center (SPRC). With GFI Israel providing visionary direction and expertise, the Technion invested \$20 million to create this multidisciplinary hub for research, commercialization, and entrepreneurship, uniting more than 30 researchers from 10 university departments to advance both plant-based and cultivated meat. GFI Israel will continue to serve as the Technion's strategic partner through the SPRC's launch, and we are working to replicate the success of this project by collaborating with The Hebrew University of Jerusalem on a related initiative.



## SPOTLIGHT

### *Increasing funding for cultivated meat research*

One of our science and technology team's core objectives is to ensure that research funding is directed to the highest-impact projects. Building on our earlier work with EIT Food, a massive EU-supported food innovation organization, GFI Europe unlocked almost €2 million in funding toward cultivated meat research. In 2022, GFI Europe collaborated with EIT Food to launch the Cultivated Meat Innovation Challenge, which awarded funding to exemplary projects that proposed solutions for driving down cultivated meat production costs. With our support, three of the winning projects successfully applied for follow-on funding in 2023. These projects directed research funds from EIT Food that were four times greater than our initial support of the Challenge.

"This is such an exciting time for cultivated meat innovation, and we're delighted to be awarding new funding to the most cutting-edge startups in the industry." — Dr. Adam M. Adamek, Director of Innovation at EIT Food

*Right: Cultivated bluefin tuna toro sushi roll*  
*Photo credit: BlueNalu*



## Seeding public investment in science

The alternative protein scientific ecosystem needs a foundation of public investment. Just as government funding is enabling the scale-up of renewable energy and electric vehicles, it will be essential for alternative proteins to scale at the pace needed.

In 2023, the UK government made its two largest investments in alternative proteins to date. UK Research & Innovation's Engineering and Physical Sciences Research Council awarded £12 million in April to the University of Bath's Cellular Agriculture Manufacturing Hub to research how to scale up cultivated meat production. The Hub will be led by Professor Marianne Ellis, a

GFI grantee. Months later, the UK's Biotechnology and Biological Sciences Research Council (BBSRC) invested £15 million in creating an Alternative Proteins Innovation and Knowledge Centre to support partnerships between businesses and academic researchers. GFI Europe's consistent engagement with BBSRC and Innovate UK helped lay the groundwork to secure this funding, and our intentional relationship-building and strategically hosted workshops influenced the selection of alternative proteins as a priority area for investment.

## Focused on our goal

GFI's science and technology teams are identifying the most important questions in the field and bringing a better food future into increasingly sharp relief. By educating the next generation of innovators through the Alt Protein Project, mapping uncharted R&D opportunities through our Research Grant Program, and catalyzing public investment in science, we are accelerating breakthroughs that have the potential to transform our food system. ▲

# Reports and resources

## Knowledge takes root

In 2023, GFI and our strategic partners published rigorous analyses and data-driven reports that catalyze further research.

## Featured GFI reports:

### State of Global Policy Report

July 2023

Our second annual comprehensive overview of the global policy landscape for alternative proteins, GFI's 2022 State of Global Policy report analyzes public investments in alternative proteins, which have likely surpassed \$1 billion. The insights in this report shine a light on the countries leading the way and prepare advocates to make an informed case for alternative proteins to global decision-makers.

### 2022 State of the Industry Reports

These authoritative global analyses are the definitive source of information on the alternative protein industry. In 2023, GFI released the first-ever Japanese translation of the reports. GFI Europe also published the first State of the Industry report focused on Germany (read more on page 5), and GFI India and GFI APAC also launched inaugural State of the Industry reports in their respective regions.

### LCA for alternative protein manufacturers

June 2023

Life cycle assessments (LCAs) measure the environmental impact of a product, and this detailed LCA guide tailored for alternative protein producers offers a standardized method for conducting LCAs and strategies for showcasing results to highlight environmental benefits.

 **42**

Reports and peer-reviewed papers published by GFI in 2023





## Cultivated meat: key opportunities and recommendations for India

May 2023

GFI India collaborated with India's national investment promotion and facilitation agency, Invest India, to co-author this first-of-its-kind report, providing an overview of the technical and market landscapes of cultivated meat with policy recommendations for India.

## Sidestreams analysis

October 2023

Offering many recommendations for policymakers and food producers, this study identifies commodity crop "waste" that can become inputs for alternative protein production, leading to lower costs and better environmental metrics.

## Needs assessment on building an inclusive AP workforce

July 2023

This report reviews the challenges faced by scientists, engineers, and entrepreneurs from underrepresented groups and describes opportunities for GFI and our partners to transform career experiences and diversify the field.

Right: GFI's alternative protein researcher directory

## Additional reports:

### Ex-ante life cycle assessment of commercial-scale cultivated meat production in 2030

January 2023

### Annual plant-based retail market insights

April 2023

### Plant-based meat manufacturing capacity report

May 2023

### Fermentation manufacturing capacity analysis

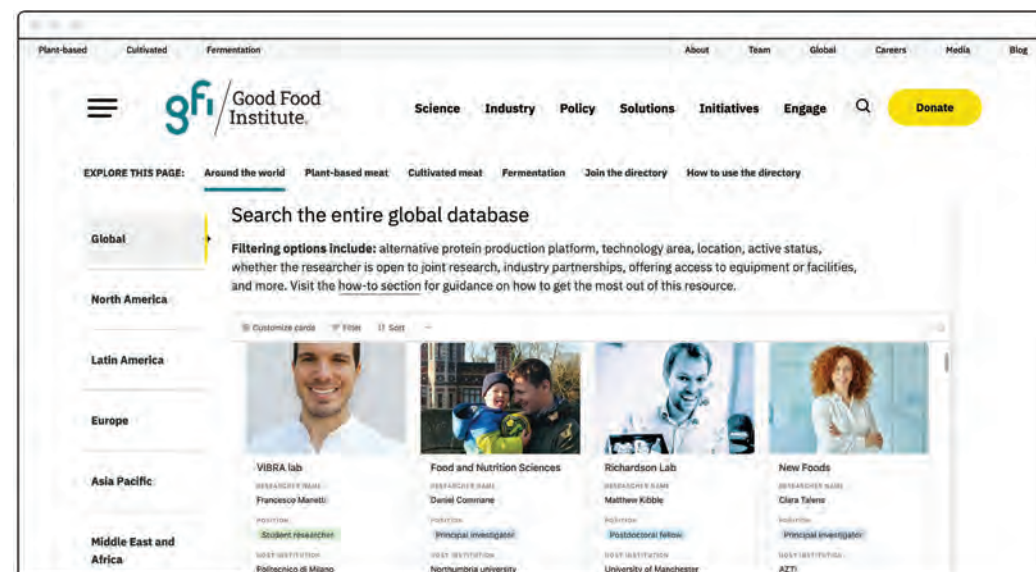
July 2023

### Cell line development and utilisation trends in the cultivated meat industry

June 2023

### Leveraging plant-based and cultivated seafood to meet climate goals

October 2023



## GFI.org: The alternative protein encyclopedia

GFI.org is more than a source of information about our global programs. It is an expertly curated content hub, serving as the world's go-to resource for the latest updates on alternative protein science, policy, and markets.

Our series of deep dives on the science of plant-based meat, cultivated meat, and microbial fermentation addresses the latest technological developments and foundational scientific questions across the field.

The new and improved alternative protein researcher directory is a global database of researchers working on projects related to alternative protein technologies that offers exclusive, curated updates on research developments, funding opportunities, and scientific events and forums.

## Featured external reports:

### Mitigating Risk and Capturing Opportunity: The Future of Alternative Proteins

May 2023

The Center for Strategic and International Studies (CSIS), a leading policy think tank, released this in-depth report on the strategic importance of alternative proteins. CSIS hosted a launch event for the report that featured food system leaders including USDA Deputy Under Secretary Sanah Baig and former U.S. National Security Council official Matt Spence, with GFI founder and president Bruce Friedrich delivering the concluding remarks. The report calls for increased public investment in alternative proteins to address food security, global health, climate change, food systems resilience, and global competitiveness.

### What's cooking?: An assessment of the potential impacts of selected novel alternatives to conventional animal products

December 2023

After nearly two years of work, the UN Environment Programme released a report at COP28 focused solely on alternative proteins as a climate solution. Several GFI team members were tapped to help write and review the report, which validates GFI's theory of change, outlines the health benefits of alternative proteins, and highlights the need for public funding and appropriate regulation to ensure they reach taste and price parity.

### Charting Asia's Protein Transition

August 2023

Written with technical guidance from GFI APAC, this report by Asia Research & Engagement outlines how rapidly Asian countries must transition their protein production to hit climate targets.



GFI Europe senior policy manager  
Acacia Smith



## SPOTLIGHT

### *GFI leads policy work for a pan-European think tank*

EIT Food is an influential EU-supported food innovation organization, and in 2023, GFI seized new opportunities to engage in their policy strategy. In February, we helped form their Protein Diversification Think Tank, a group that convenes select experts from academia, industry, and nonprofit organizations. Our thought leadership was recognized when GFI Europe senior policy manager Acacia Smith was elected as one of two vice presidents, leading the Think Tank's policy work. Acacia's role positioned us to advise on recommendations contained within EIT Food's reports and analyses: in October, Acacia coordinated the Think Tank's policy brief "Accelerating Protein Diversification for Europe," which was launched at EIT Food's flagship conference and shared with the European Commission.



# Events

GFI and our strategic partners brought together policymakers, scientists, students, industry leaders, and alternative protein champions to address the biggest challenges and opportunities across the field and inspire cross-sector collaboration.



## Good Food Conference

The 2023 Good Food Conference® at the Fort Mason Center for Arts & Culture convened alternative protein advocates and innovators from more than 40 countries. Attendees gained technical insights on solutions aimed at the biggest challenges in the field—from reaching taste and price parity to incorporating novel ingredients, improving production systems, and more. Some of the largest meat and food companies in the world presented their industry-shaping work, and leading policymakers championed the urgent need for public investment in alternative protein research and development. Read more on page 9.



The GFC 2023 mainstage

# 10,000

Innovators convened by GFI in 2023 across 70+ countries

## Good Food Conference side events

### The Global Student Symposium

Bringing together 59 students from 17 countries across five continents, this day-long gathering was an opportunity for emerging leaders to share insights from their studies and bond over their mission to transform the global food system. Mariel Alem Fonseca, president of the Cambridge Alt Protein Project, shared what the event meant to her: “The sense of community and shared passion among attendees, including industry leaders and academics, was truly inspiring. Conversations among students led to the initiation of a regional European project, bringing like-minded individuals from different universities together to plan events and further our mission in the field of alternative proteins.”

### The Alternative Protein Chef Luncheon

Chefs are the storytellers of food: by translating cutting-edge technology into delicious meals, chefs have the power to connect alternative protein products to the experiences and flavors that consumers love. Several top alternative protein companies have rolled out their products via Michelin-starred chefs, and the sector needs these culinary artists in order to succeed. The Alternative Protein Chef Luncheon, hosted at the nonprofit Farming Hope, brought together influential chefs, companies, and investors for a meal showcasing alternative protein products, with several chefs later incorporating the products they sampled into their menus.

**“We came away from the Good Food Conference with the optimism that despite all the challenges the industry faces, there are already tangible innovations on the horizon. We feel even more reinvigorated by the passion and ingenuity of the people working in this field.”**

– Peemdej Utsahajit, Director of Open Innovation, CP Foods (one of the largest meat companies in Asia), Good Food Conference 2023 gold-level sponsor

## Agriculture Innovation Mission (AIM) for Climate Summit

At this leading global event, GFI elevated the role of alternative proteins in food system innovation. Partnering with FAIRR, Climate Advisers, the UN Foundation, ProVeg, and ClimateWorks Foundation, we organized a private ministerial dinner co-hosted by the governments of Brazil and the Netherlands for high-level officials to explore the climate and food security benefits of alternative proteins. USDA Deputy Under Secretary Sanah Baig welcomed dinner participants to the Summit, emphasizing the USDA's commitment to alternative proteins.



*GFI team members (left to right: Bruce Friedrich, Caroline Bushnell, Gus Guadagnini, Jessica Almy, and Stephanie von Stein) at AIM for Climate.*

## GFI APAC at Singapore International Agri-Food Week

GFI APAC launched several initiatives at Singapore International Agri-Food Week, including the APAC Regulatory Coordination Forum (read more on page 7), a plant-based meat workforce training program (read more on page 11), and the Communication Leadership in Future Foods or CLIFF initiative, which will offer training on proven communications strategies to help companies explain their products in a way that resonates with consumers and regulators.



*GFI APAC managing director Mirte Gosker speaks at Singapore Agri-Food Week. Photo credit: Rethink Foods*

## GFI Israel at the 51st Annual Conference for Science and the Environment

GFI Israel hosted a plenary session at Israel's largest professional environmental gathering featuring GFI Israel CEO Nir Goldstein, international food security experts, and representatives from the U.S. Embassy and the Israeli government. The panel discussion featured Stephanie Hallett, the current Chargé d'Affaires ad interim at the U.S. Embassy in Jerusalem, and Gideon Behar, Special Envoy for Climate Change and Sustainability in the Israeli Ministry of Foreign Affairs, who stated: "There is a mission knocking on our door. We have the responsibility as a nation to solve the climate crisis, and that cannot be done without alternative proteins."

# 20,000

Stakeholders informed about the power and potential of alternative proteins by GFI experts at third-party events hosted around the world



## Selected events led by GFI and our strategic partners

The Future of Food Capitol Hill Reception | GFI Europe x Cell Press: Accelerating scientific progress on sustainable proteins | Future Food-Tech Reception co-hosted with Barclays | Ask GFI: Alt Protein Careers | New Meat Brazil | ESG Framework Specialist Investor Working Group | White space workshop: Fish cell culture | Ask Me Anything with GFI's Fermentation Scientists webinar | FoodHack Singapore x GFI APAC Meetup | Accessing Financing through the Department of Energy webinar | Smart Protein Forum: University of Trans-Disciplinary Health Sciences and Technology x GFI India | Reimagining meat: The scientific case for alternative proteins | Cultivating alternative proteins from commodity crop sidestreams



## COP28

This UN-led global event in Dubai brought together world leaders at a critical moment for transformative climate action. GFI's presence spanned our affiliate organizations and covered multiple pavilions and zones. A few highlights: GFI Brazil CEO Gus Guadagnini convened government and industry leaders for discussions on the climate resilience and food security benefits of alternative proteins; GFI founder and president Bruce Friedrich and USDA Under Secretary and Chief Scientist Dr. Chavonda Jacobs-Young emphasized the importance of government investment in alternative proteins; and GFI APAC managing director Mirte Gosker moderated a discussion about how nations can collaborate to scale up novel food production.

## GFI India at World Food India

Partnering with the Ministry of Food Processing Industries, GFI India highlighted alternative proteins at this leading three-day food event introduced by Prime Minister Narendra Modi and attended by participants from more than 80 countries. GFI India acting managing director Sneha Singh moderated a panel, and we hosted two pavilions: one showcasing 11 companies and another featuring sustainable technology in food processing for alternative proteins.



*The Global Student Symposium kicks off at the 2023 GFC.*

## Selected global events where alternative proteins took the stage

Climate Week NYC | Bonn Climate Change Conference | Planetary Stewardship Summit 2023 | Bio Innovation Leaders Summit | Global Summit on the Future of Food | Annual Global Food Security and Sustainability Summit 2023 | Agri-Food Systems Summit | FoodSHIFT 2030 Policy Conference | Dubai Future Forum | Food Security Asia Congress | Meat Pro Asia | FHA Food and Beverage (Asia's largest international food and beverage trade show) | 1st Malaysia Cultivated Meat Conference | India Global Forum | World Resources Institute India: Connect Karo | World Agri-Tech South America Summit | Food ingredients South America | Brazil Climate Summit 2023 | Seafood Show Latin America | German Bioeconomy Forum | EIT Food annual conference | USA Dry Pea and Lentil Council seminars | Vectors Capital/MIT BioInnovation x Climate Event | VERGE23 climate tech conference | Society of Environmental Journalists Annual Conference



Recordings for GFI-convened conferences and events can be found on GFI's YouTube channel.

## SPOTLIGHT Alternative protein science event series

In 2023, GFI's SciTech team led several event series to promote and advance alternative protein science:

We partnered with professional societies, including the Biochemical Society, American Society of Cell Biology, Society for Industrial Microbiology, and Institute for Advancement of Food and Nutrition Science, to host a series of Career Pathways webinars that illuminated opportunities for scientists to engage in alternative protein innovation.

Our Science of Alt Protein webinars showcased insights from 10 prominent scientists leading the field of plant-based, fermentation-derived, and cultivated proteins, bringing expert voices in alternative protein science to more than 2,000 live attendees and even more YouTube viewers.

Our invitation-only Cultivated Meat Collaborative webinar series brought together more than 19 companies driving progress in the cultivated meat industry, attracting more than 200 scientists and cultivated meat company founders from around the world.

Following a GFI-hosted workshop that highlighted the need for more networking opportunities for cultivated seafood researchers, GFI lead scientist Dr. Claire Bomkamp organized and hosted the first meetings in a series of events appropriately titled Fish & CHIPS (Collaborative Huddle for Ideation & Problem Solving).

# GFI in the news

GFI engaged with journalists from the world's most respected and influential news outlets, with many seeking out our subject matter experts for stories covering the dynamic field of alternative proteins.

## The Guardian

January 2023

*"We know we can't really hit the goals in the Paris climate agreement without addressing meat consumption and we think alternative proteins are the best way to address that."*

— Dr. Elliot Swartz, GFI principal scientist, cultivated meat



March 2023

*"Consumers and future generations deserve the foods they love made more sustainably and in ways that benefit the public good — ways that preserve our land and water, ways that protect our climate and global health."*

— Bruce Friedrich, GFI president and founder



August 2023

*"If nations prioritize the manufacturing and development of alternative proteins, the climate payoff could be colossal."*

— Mirte Gosker, GFI APAC managing director



December 2023

*"A platform that is funded by the government is probably the only way that one could put companies and industry partners and academic groups together to work on collaborative R&D budgets."*

—Alla Voldman, GFI Israel VP of strategy and policy

## South China Morning Post

January 2023

*"Just as [Asia] successfully harnessed the power of the sun and wind to satisfy skyrocketing electricity needs, we must now harness protein directly from plants, microbes, and cultivated animal cells—the food equivalents of clean energy."*

— Ryan Huling, GFI APAC senior communications manager



April 2023

*"We have to be open to all the tools in our toolkit to make a food system that can actually sustain a population of the size we're approaching."*

— Dr. Liz Specht, GFI senior VP of science and technology

## CRÍTICA

August 2023

*"Promoting the development of the cultivated meat ecosystem in Amazonas can be crucial to insert the state into the sustainable development circuit so desired by governments and encouraged by international forums."*

— Alexandre Cabral, GFI Brazil policy director



# 3,400

GFI media hits and quotes in 2023



# Powered by donors



“It’s been inspiring to see GFI tackle policy, corporate engagement and scientific progress in a single umbrella organization with global reach. GFI’s efforts have clearly accelerated sector growth. It is also heartening to see the organization scale as the sector expands and the issues become increasingly complex. GFI has made an indelible impact on the alternative protein industry.”

– Gautam Godhwani, GFI donor

“Meat consumption is the highest it’s ever been, and there’s simply not enough land or water to continue feeding the world this way. That’s where GFI steps in. I have no doubt that this mission-driven work will lead to a healthier and more sustainable world. I am proud to support this effort as I can think of few other places with the potential to generate this much impact.”

– Josh Love, GFI donor



“Donating to GFI accelerates the diversification of worldwide protein sources, a shift necessary to achieving our climate targets and an effective catalyst for reducing the toll of industrialised meat production on farmed animals and ecosystems.”

– Sebastian Schienle, Effektiv Spenden, GFI partner

“I give to GFI because I know that my support has an impact on the entire alternative protein ecosystem. Global problems need global solutions, and GFI is taking a truly global approach to food system transformation by mobilising change around the world.”

– Preben Stokkan, GFI donor

“GFI enables entrepreneurs, scientists, investors, and anybody willing to join to create a fairer food system, improving the lives of animals and people. Donating makes me a part of the change.”

– Jordi Morales Dalmau, GFI donor

## SPOTLIGHT

### *Giving Green recommends GFI as a top climate charity*

Giving Green selects organizations that maximize the impact of donations on the climate, and their renewed recommendation highlights how “GFI has been a powerhouse in [alternative protein] thought leadership and action with impressive wins.” Charity Navigator conducted due diligence on Giving Green and found them to be so well-researched that GFI is now included as one of Charity Navigator’s top four charities for climate impact.



# FROM THE ground *up*

Your support of GFI is turning our bold vision into reality. Thanks to you, we're building a better future of food from the ground up.

**GFI.ORG** ➔

## ABOUT THE GOOD FOOD INSTITUTE

The Good Food Institute is a nonprofit think tank and international network of organizations working to make the global food system better for the planet, people, and animals. Powered by philanthropy, GFI's global teams advance alternative proteins as an essential solution needed to meet the world's climate, health, food security, and biodiversity goals.

### *Mission*

We are developing the roadmap for a sustainable, secure, and just protein supply. We identify the most effective solutions, mobilize resources and talent, and empower partners across the food system to make alternative proteins accessible, affordable, and delicious.

The Good Food Institute, Inc.  
U.S. TAX ID #81-0840578  
**Contact us:** [philanthropy@gfi.org](mailto:philanthropy@gfi.org)

### *Vision*

A world where alternative proteins are no longer alternative.

### *Values*

Believe change is possible.  
Do the most good we can.  
Share knowledge freely.  
Act on evidence.  
Invite everyone to the table.

