

**The mycelium
revolution**

15/11/22 GIRONA

FÓRUM CÁRNICO
Y DE LA PROTEÍNA
ALTERNATIVA

TECNO
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gfi
Europe™



CARLOTTE LUCAS

**CORPORATE MANAGER
THE GOOD FOOD INSTITUTE EUROPE**



The State of the Fermentation Industry

*Carlotte Lucas,
Corporate Engagement Manager*



**FÓRUM CARNICO
Y DE LA PROTEÍNA
ALTERNATIVA**

The Good Food Institute

GFI is an international nonprofit developing the roadmap for a sustainable, secure, and just protein supply. We focus on three key areas of work:



Science and Technology

Advancing foundational, open-access research in alternative proteins and creating a thriving research and training ecosystem around these game-changing fields.



Corporate Engagement

Partnering with companies and investors across the globe to drive investment, accelerate innovation, and scale the supply chain—all faster than market forces alone would allow.



Policy

Advocating for fair policy and public research funding for alternative proteins.



GFI officially earned GuideStar's 2019, 2020, and 2021 Platinum Seal of Transparency—obtained by less than 1% of nonprofits—reflecting our commitment to maximum impact, efficiency, and inclusion.

We work as a force multiplier, bringing the expertise of our departments to the rest of the world.



United States
Brazil
India

Europe
Asia Pacific
Israel

160+ staff in 6 regions



GFI's approach



The challenge

Current meat, egg, and dairy production is unsustainable and inefficient. It is a key driver of climate change, environmental degradation, and antibiotic resistance.



GFI's solution: Accelerating alternative proteins

We can create meat, eggs, and dairy more sustainably and efficiently by making them from plants, cultivating them directly from cells, or producing them by fermentation.

Instead of asking consumers to give up the foods they love, GFI is accelerating the transition to alternative proteins by helping companies make products that are **delicious**, **affordable** and **accessible**.

The alternative protein landscape

Plant-based



Photo courtesy of Plant-Based Seafood Co.

Fermentation



Photo courtesy of Ecovative Design: Atlast Food Co.

Cultivated

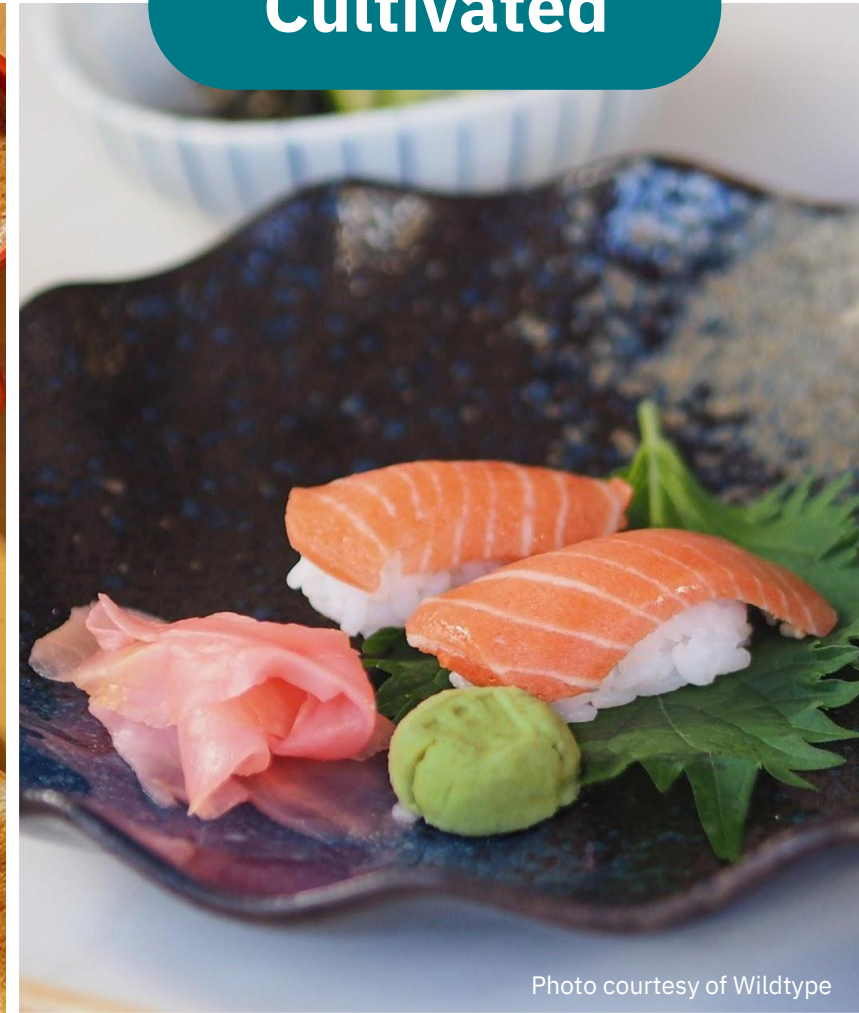
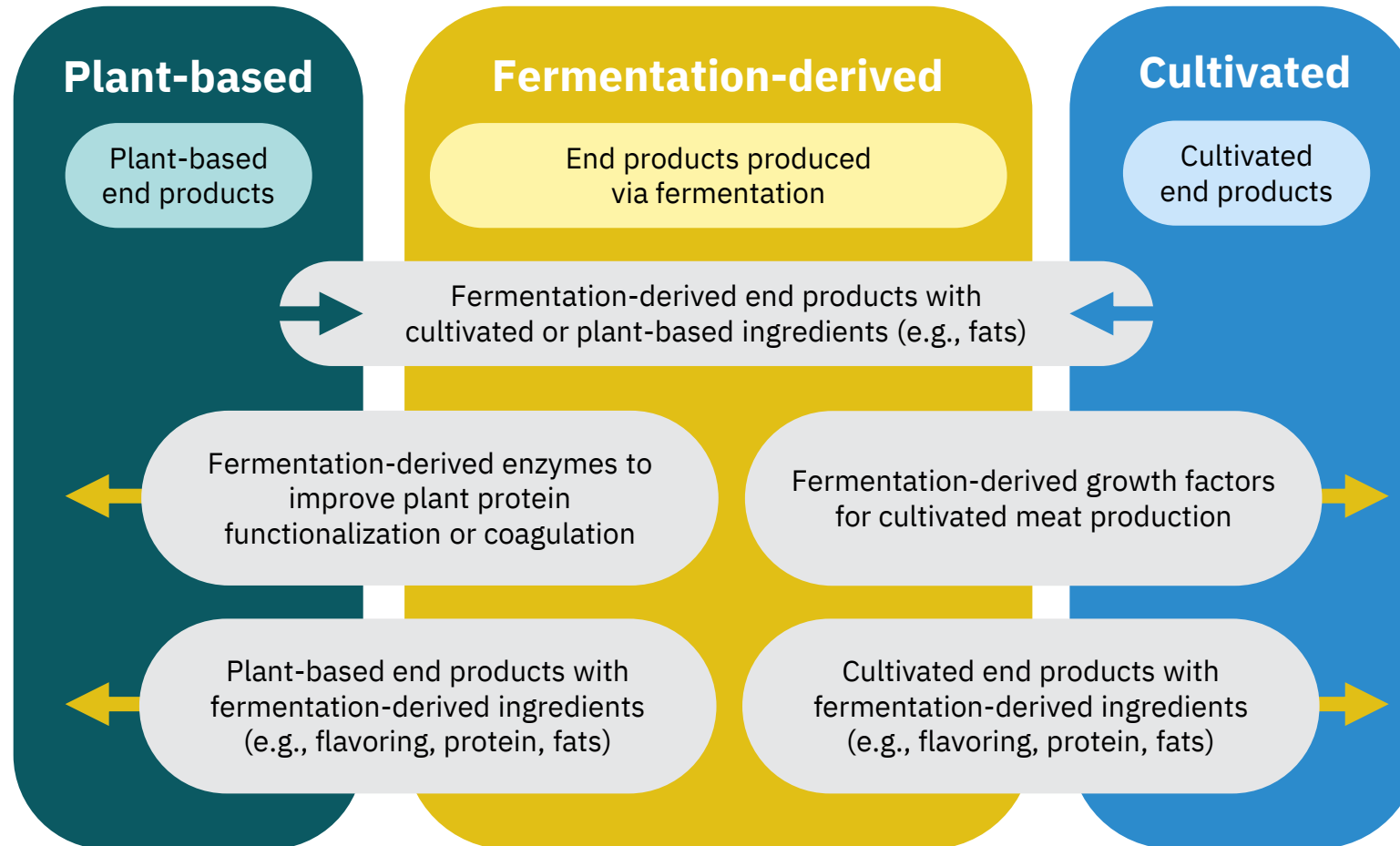


Photo courtesy of Wildtype

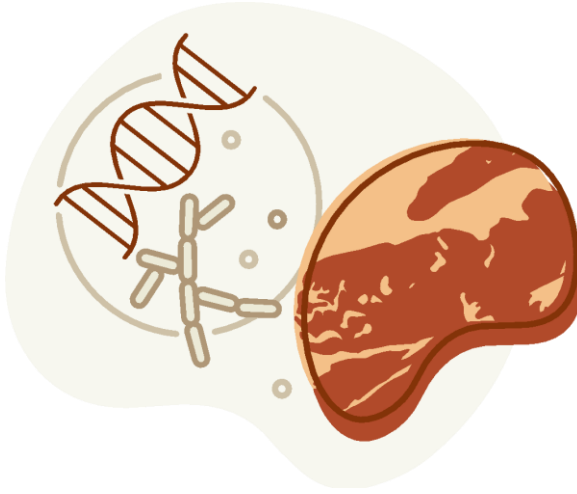
Hybrid products will become increasingly common



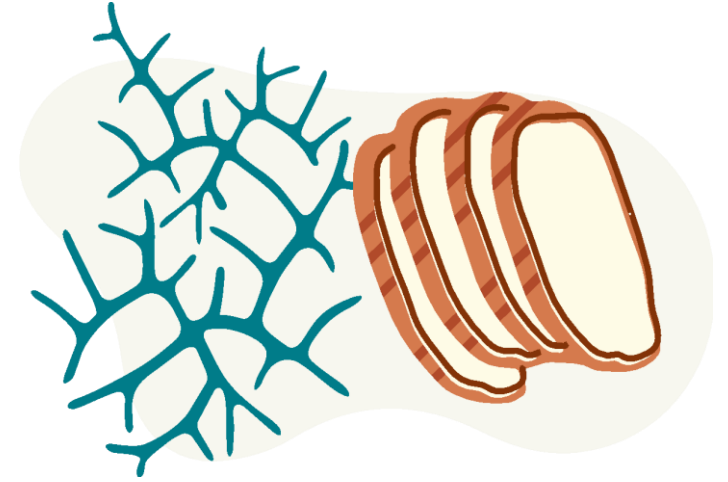
Fermentation in alternative proteins



Traditional fermentation



Precision fermentation



Biomass fermentation

Biomass fermentation: high protein content and quality; imparting meat-like texture without extrusion or extensive processing



ENOUGH[®]



LIBRE[®]



MYCORENA



Precision fermentation can address key functional and sensory challenges in alternative protein products

EVERY



Egg white proteins

Formo
PERFECT DAY



Milk proteins
(casein, whey)

IMPOSSIBLE
paleo



Heme proteins

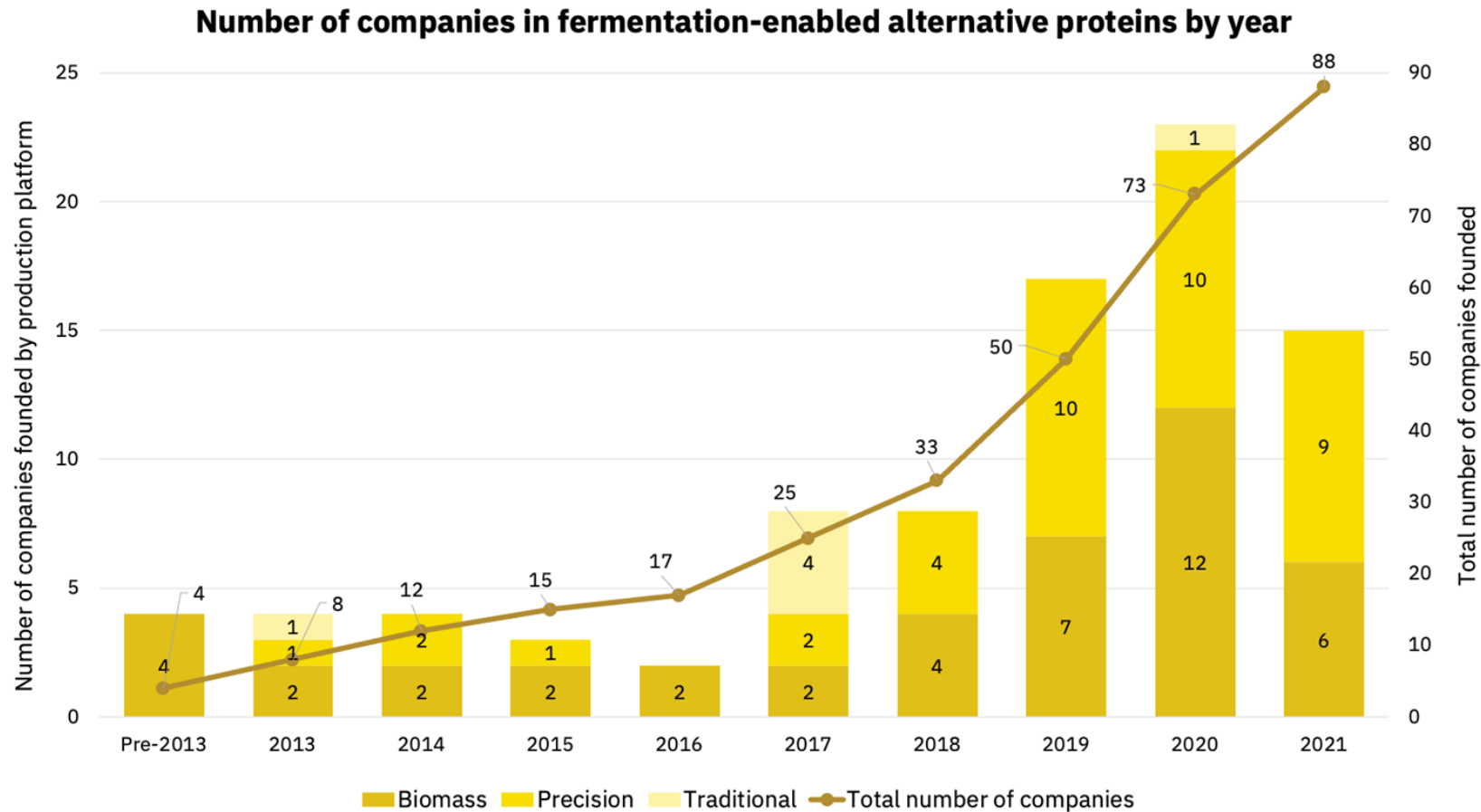
nourish
INGREDIENTS

Melt & Marble



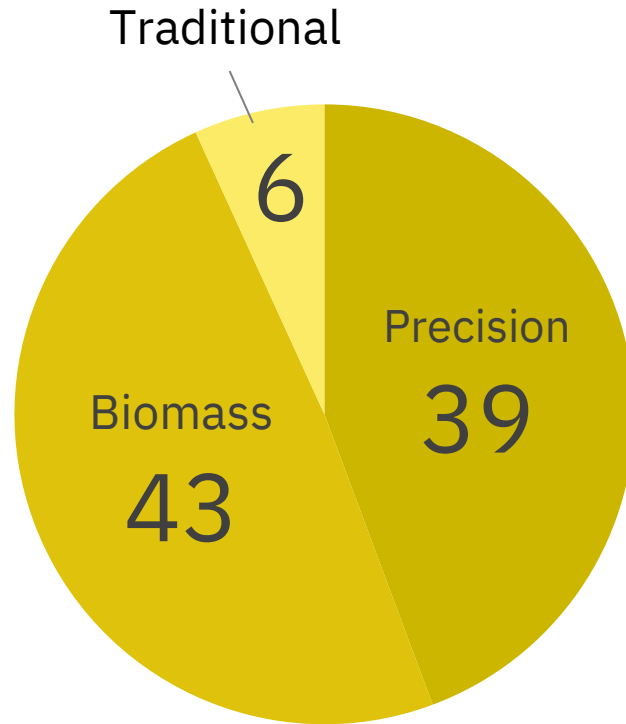
Fats & oils

The fermentation landscape is expanding



Companies are innovating across fermentation categories

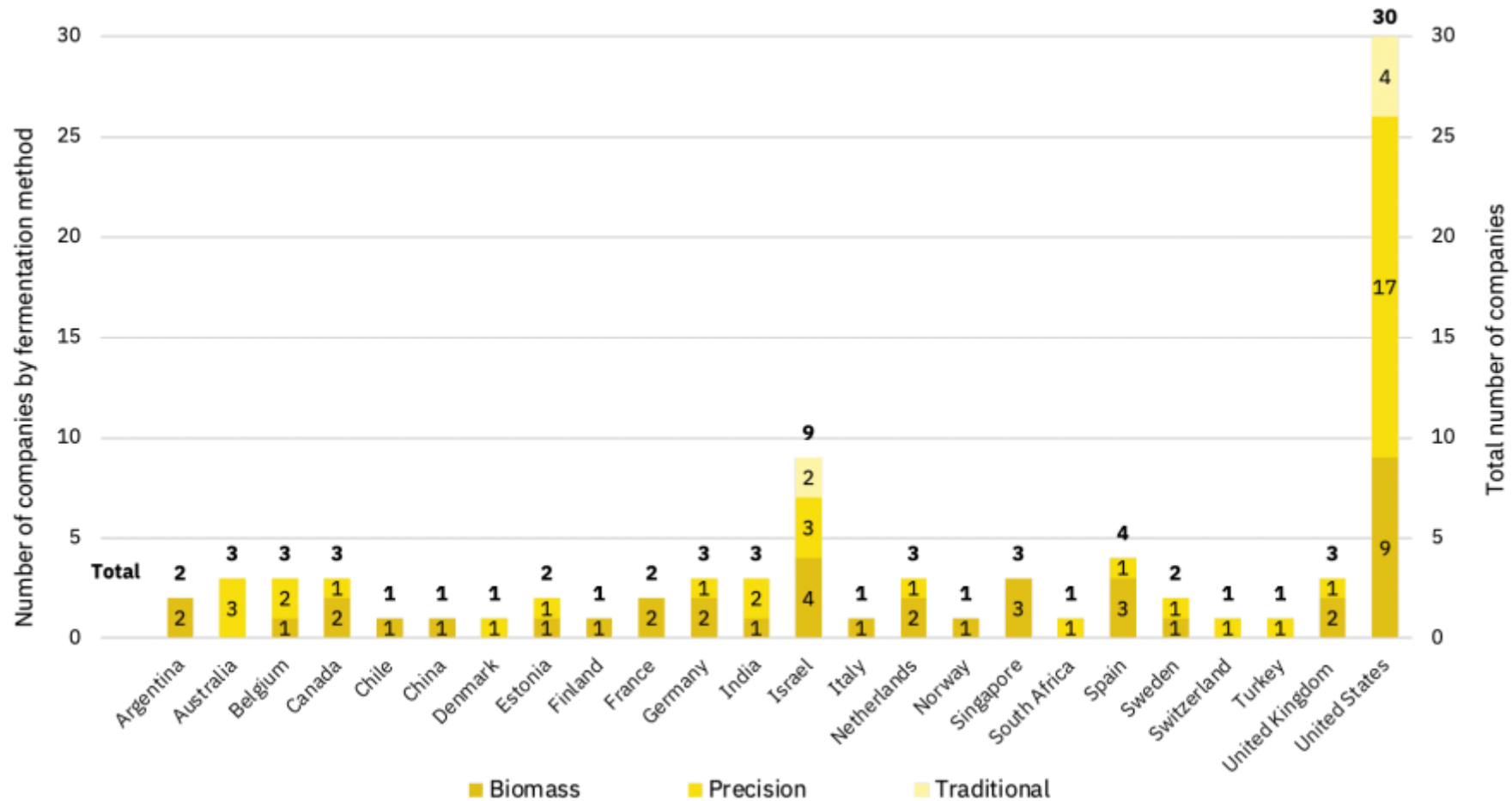
Number of companies



- Over 60% of precision fermentation companies are focused on dairy.
- The majority of biomass fermentation companies produce ingredients for meat analogues or end products.

The United States leads in fermentation-enabled companies

Geographic distribution by headquarters

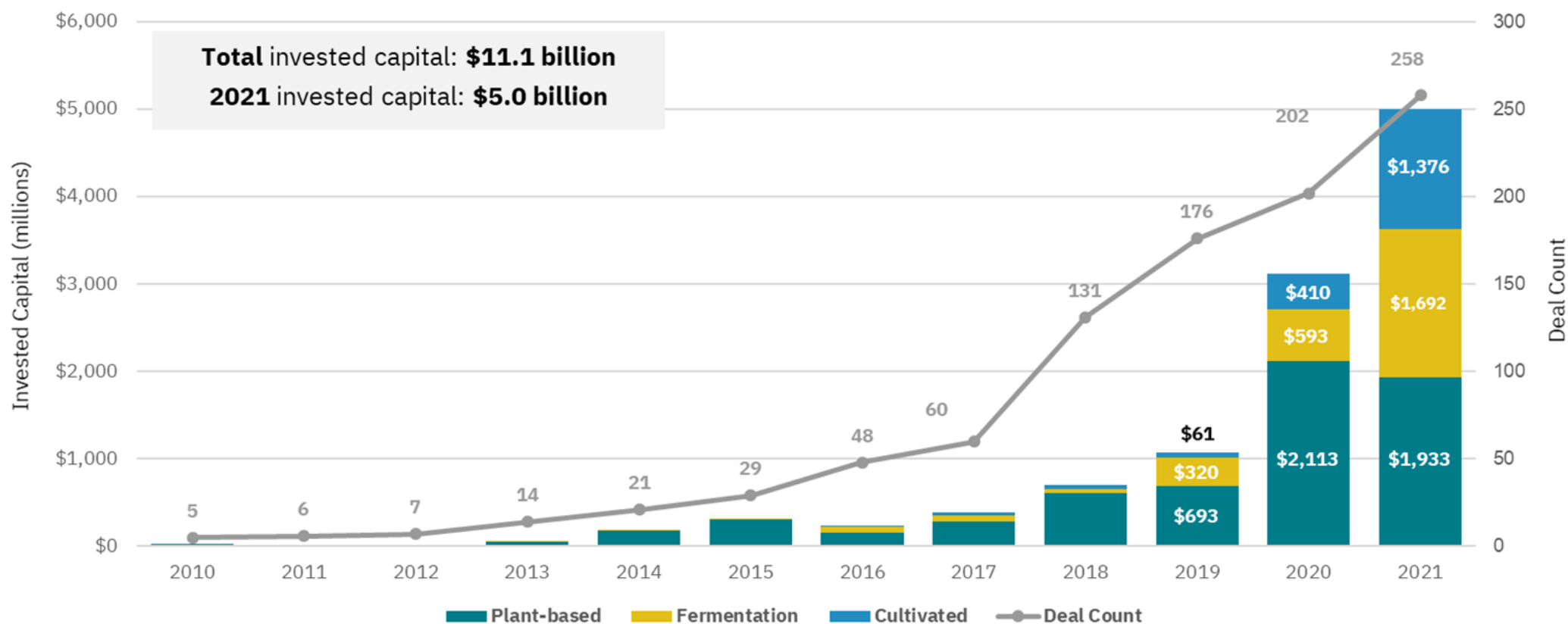


Alternative proteins seeing rapid investment growth

13

Annual investments in alternative protein companies

2010 - 2021



Fermentation investments grew 2.9x from 2020 to 2021

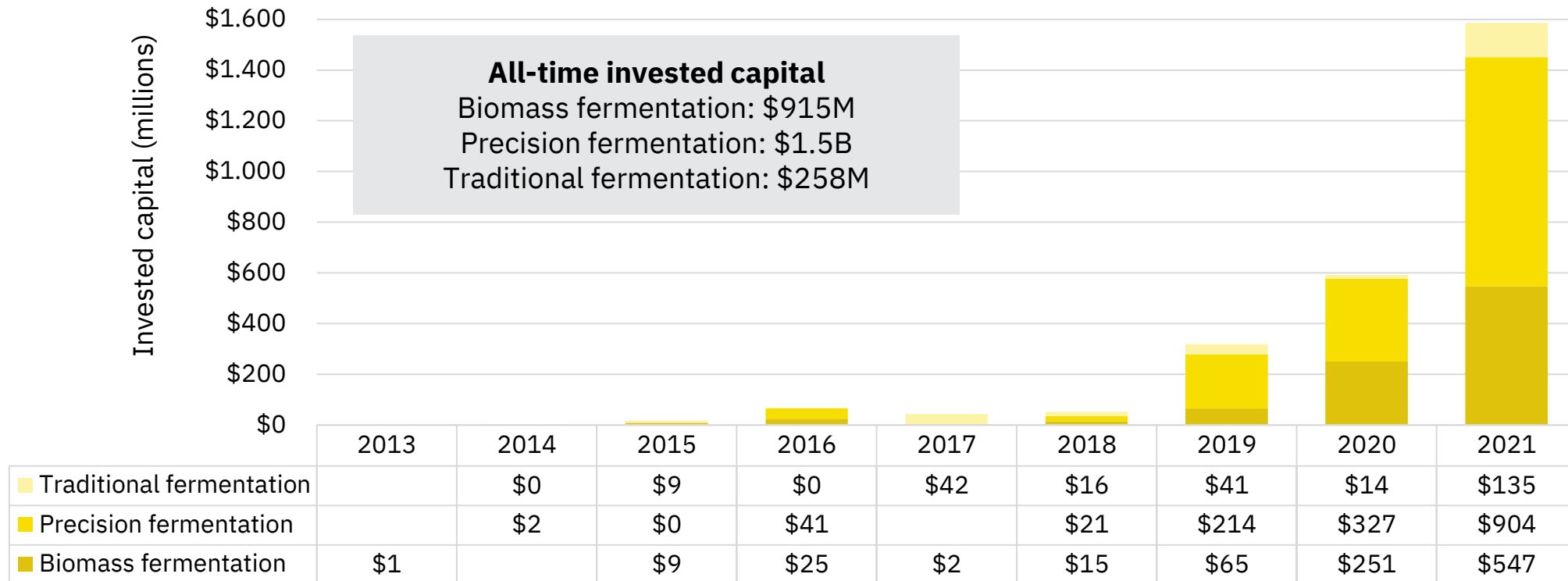
Source: GFI analysis of PitchBook Data, Inc. Data has not been reviewed by PitchBook analysts.

Note: Invested capital includes accelerator and incubator funding, angel funding, seed funding, equity and product crowdfunding, early-stage venture capital, late-stage venture capital, private equity growth/expansion, capitalization, corporate venture, joint venture, convertible debt, and general debt completed deals.



Precision fermentation raises most capital

Investments by type of fermentation
2013 – 2021



Source: GFI analysis of PitchBook Data, Inc. Data has not been reviewed by PitchBook analysts.

Note: Invested capital includes accelerator and incubator funding, angel funding, seed funding, equity and product crowdfunding, early-stage venture capital, late-stage venture capital, private equity growth/expansion, capitalization, corporate venture, joint venture, convertible debt, and general debt completed deals.

New fermentation production facilities

Better Meat Co
California, United States
Completed in 2021

Culture Biosciences
Chicago, United States
Underway

Quorn
Texas, United States
Completed in 2021

Superbrewed Foods
Minnesota, United States
2022

Motif FoodWorks
Massachusetts, United States
2022

Nature's Fynd
Chicago, United States
2022/2023

Mycorena
Sweden
2022

Solar Foods
Finland
2023

The Protein Brewery
Netherlands
Completed in 2021

Enough
Netherlands
2022

Asia Sustainable Foods Platform
Singapore
Underway

Partnerships are accelerating sector growth



ENOUGH's "Abunda" mycoprotein will be used as an input to Unilever's The Vegetarian Butcher brand meat products.



Anheuser-Busch InBev partnered with EverGrain to use spent grain from the beer-making process to create alternative protein products.



The Better Meat Co. signed deals with meat industry incumbent Hormel Foods to create products with Better Meat's mycoprotein, Rhiza.

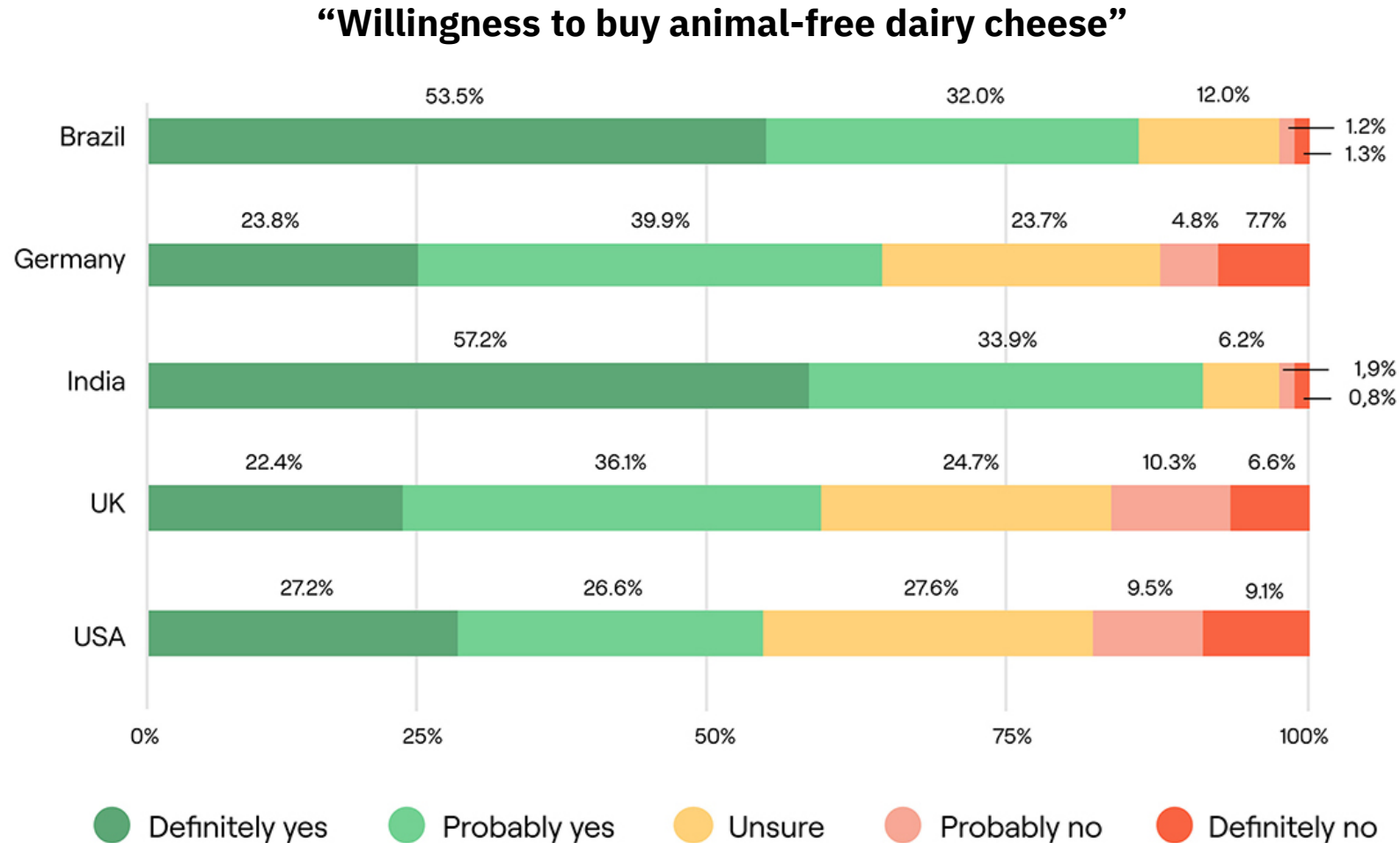


CK Ingredients signed an MOU with The Protein Brewery to commercialize its Fermotein ingredient in North America.



Nourish Ingredients formed a partnership with Australian cultivated meat startup Vow to develop cultivated meat with fermentation-derived fat.

Initial research on consumer acceptance of precision fermentation is promising



Regulatory milestones in fermentation-derived alternative proteins



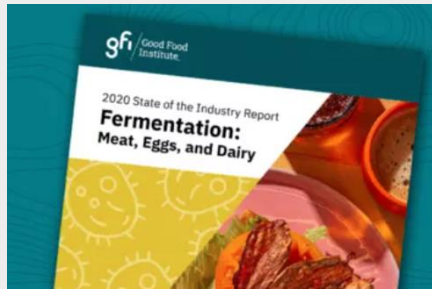
Multiple companies have obtained “no questions” letters from the FDA for purified fermentation-derived ingredients considered “**generally recognized as safe**” (GRAS).

- December 2021: **Motif Foodworks** received a no questions letter for a heme protein derived from yeast, which the company calls HEMAMI™.
- September 2021: **EVERY Company** received a no questions letter for a soluble egg-white protein produced by yeast.
- March 2021: **Nature’s Fynd** received a no questions letter for a fungi-derived protein.
- March 2020: **Perfect Day** received a no questions letter for beta-lactoglobulin, the major protein in whey.
- July 2018: **Impossible Foods** received a no questions letter for its soy leghemoglobin.

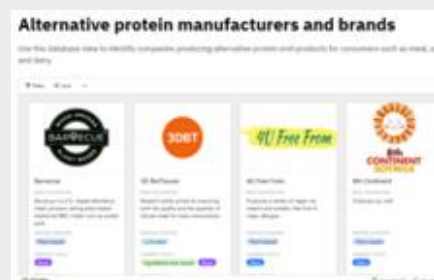


In the EU, alternative proteins derived from precision fermentation fall under the **novel food regulation** if there are no viable cells or DNA from the production microorganism in the final product. Currently, there are no approved alternative proteins derived from precision fermentation, but there are precedents for other food ingredients, which provide a good indication that proteins derived from precision fermentation can obtain approval in the EU.

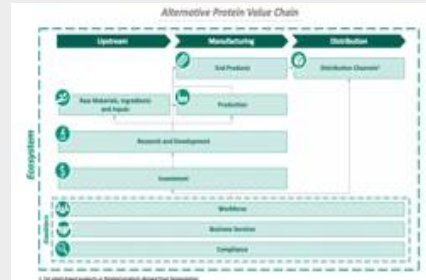
Resources



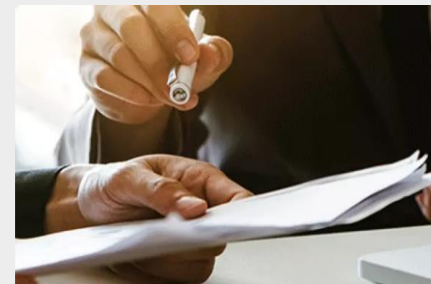
REPORTS
State of the Industry
Reports >>



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