

# **Alternative Proteins for the Global Market**

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**GFI Consultancy (GFIC) is a China-based impact consultancy firm focused on providing industry insights and R&D resources to support the alternative protein sector.**

**We work collaboratively with academic institutions, scientists, corporations, startups, and investors to accelerate plant-based, fermentation-enabled, and cultivated protein innovation in China.**





# Our partner—the Good Food Institute (GFI)

**GFI is an international network of nonprofits developing the roadmap for a sustainable, secure, and just protein supply.**

## Key areas of work:



### Science and Technology

Advancing foundational, open-access research in alternative proteins



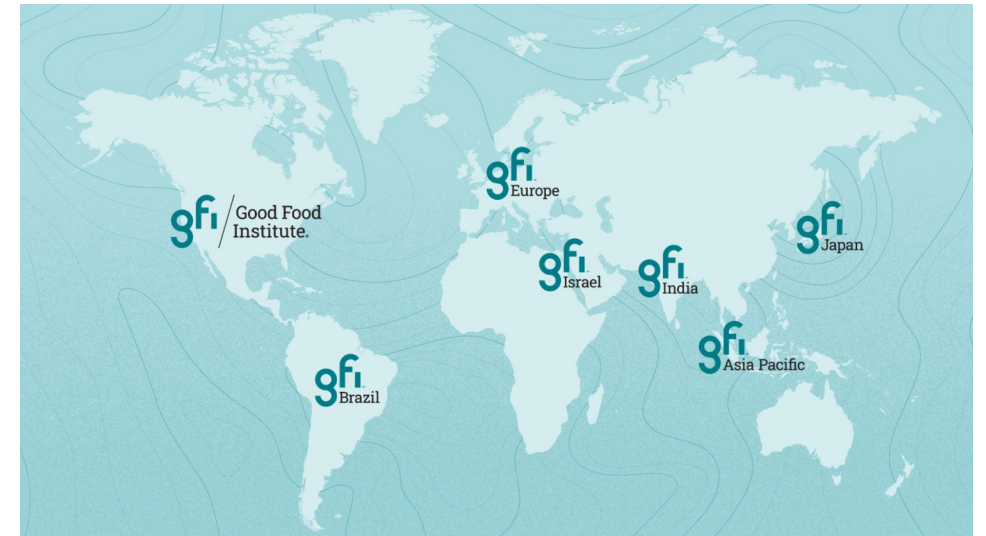
### Corporate Engagement

Partner with companies and investors to unlock funds, innovation, and scale



### Policy

Work with policymakers and regulators to ensure a clear path to market and secure support for research and innovation



United States  
Brazil  
Europe

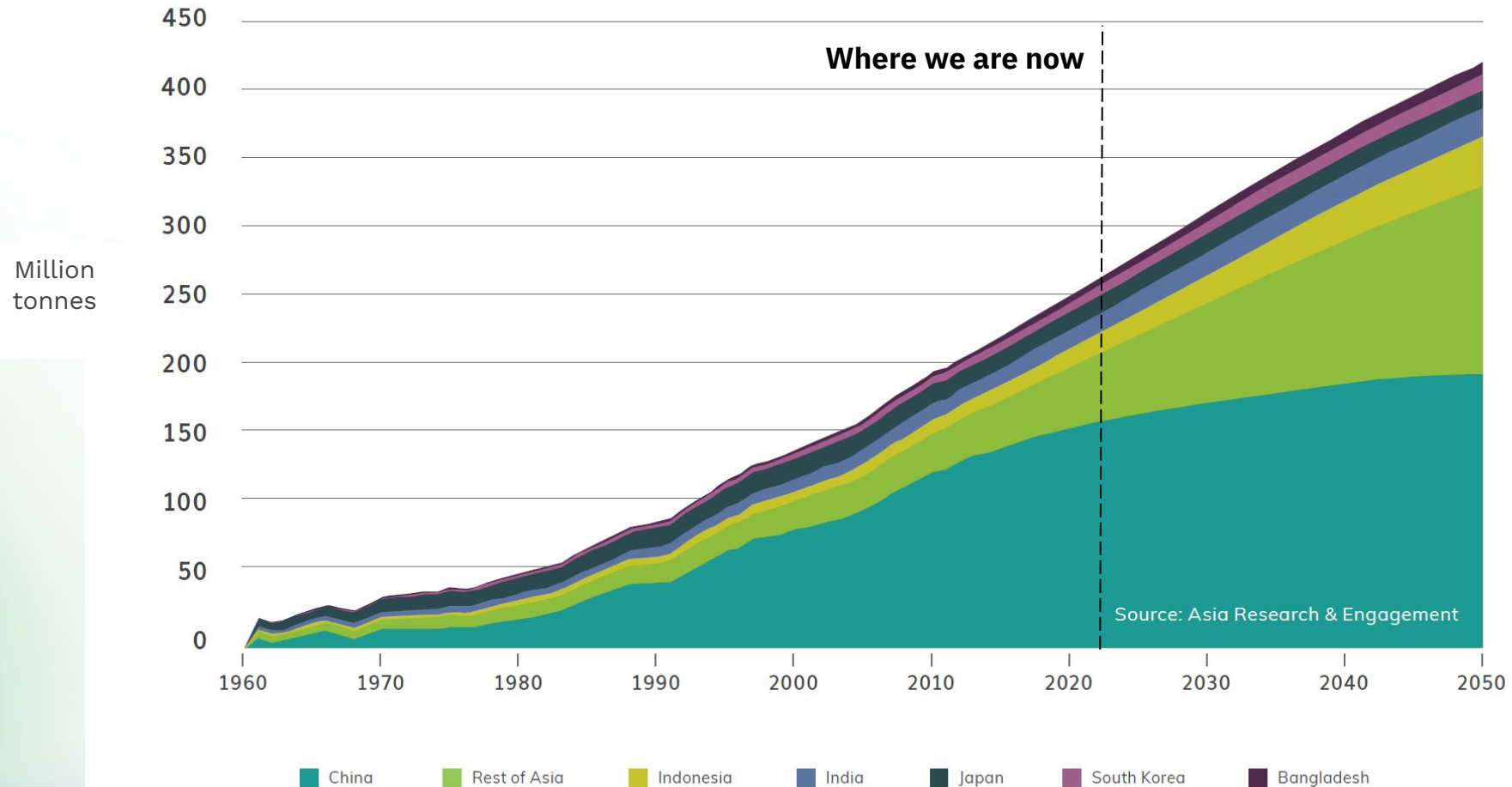
Israel  
India  
Asia Pacific  
Japan

**200+ staff in 7 regions**



# Demographic changes in Asia will push demand for animal protein to new heights

Asia's projected meat and seafood consumption growth, 1961-2050





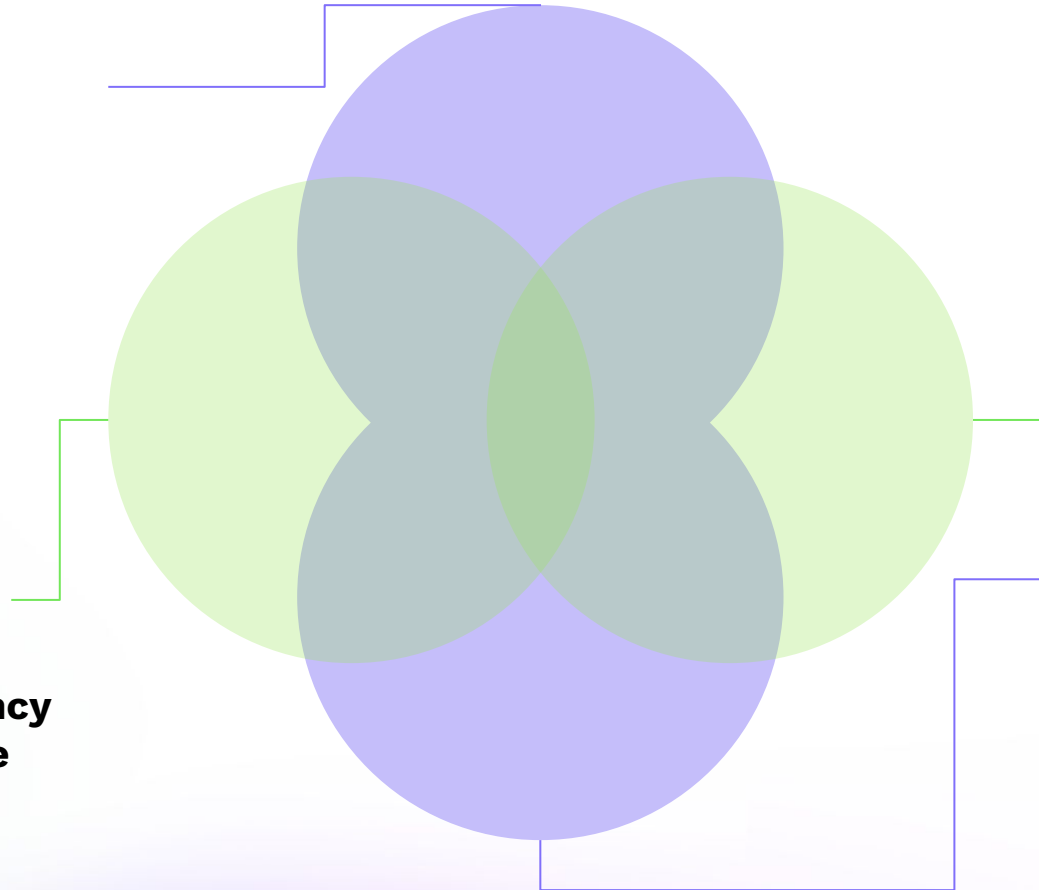
# Conventional meat production is fundamentally unsustainable

## Environmental Devastation

- Accounts for 14.5% of global greenhouse emissions
- Land use, water use, nutrient runoff
- Loss of biodiversity

## Global Food Insecurity

- Tremendous inefficiency in the face of resource scarcity



## The Next Global Pandemic

- 75% of emerging human pathogens are zoonotic in origin
- 10 million annual deaths from antimicrobial resistance in 2050

## Animal Suffering

- Billions of animals a year, and growing

Source: FAO, retrieved from Our World in Data (2022)



**But there is an alternative.**

**What if we could transition to alternative meat, eggs, and dairy produced in **more sustainable and efficient ways** without compromising on the **taste, affordability, and accessibility** of animal-based products?**

# Protein diversification



Plant-based



Photo courtesy of Plant-Based Seafood Co.

Fermentation



Photo courtesy of Meati

Cultivated

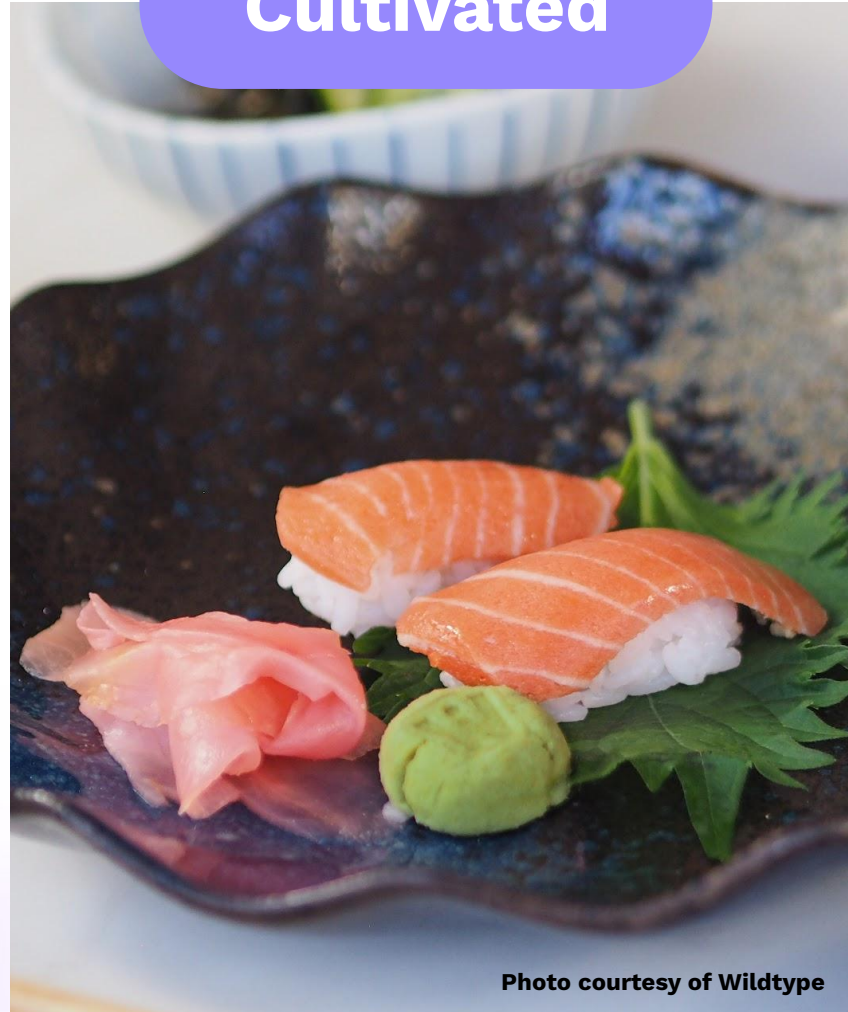
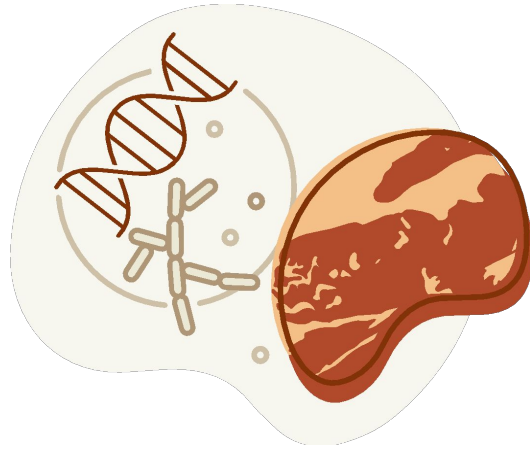


Photo courtesy of Wildtype

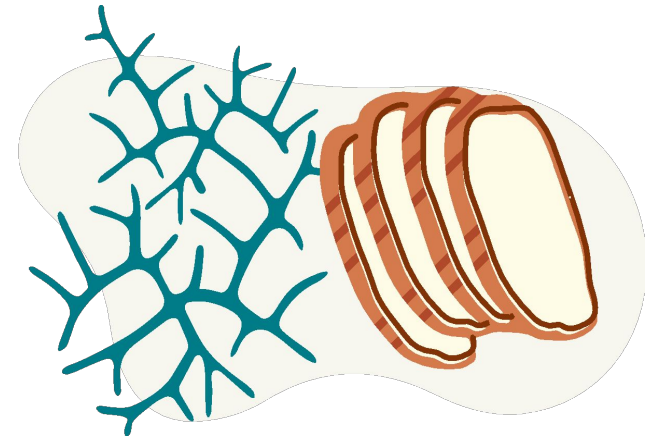
# Fermentation in alternative proteins



**Traditional  
fermentation**



**Precision  
fermentation**



**Biomass  
fermentation**

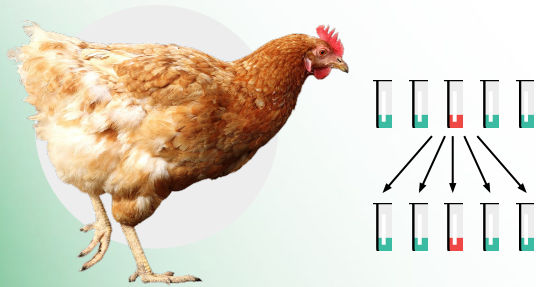


# What is cultivated meat and how is it made

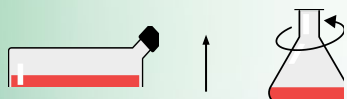


## SAMPLE

A small sample of cells is obtained from an animal.

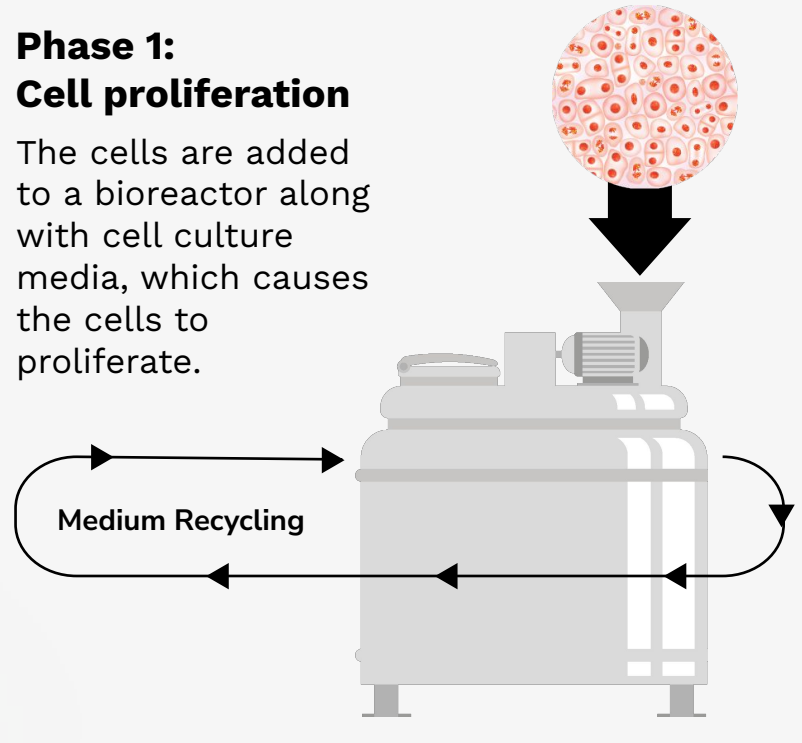


## CELL STARTER CULTURE



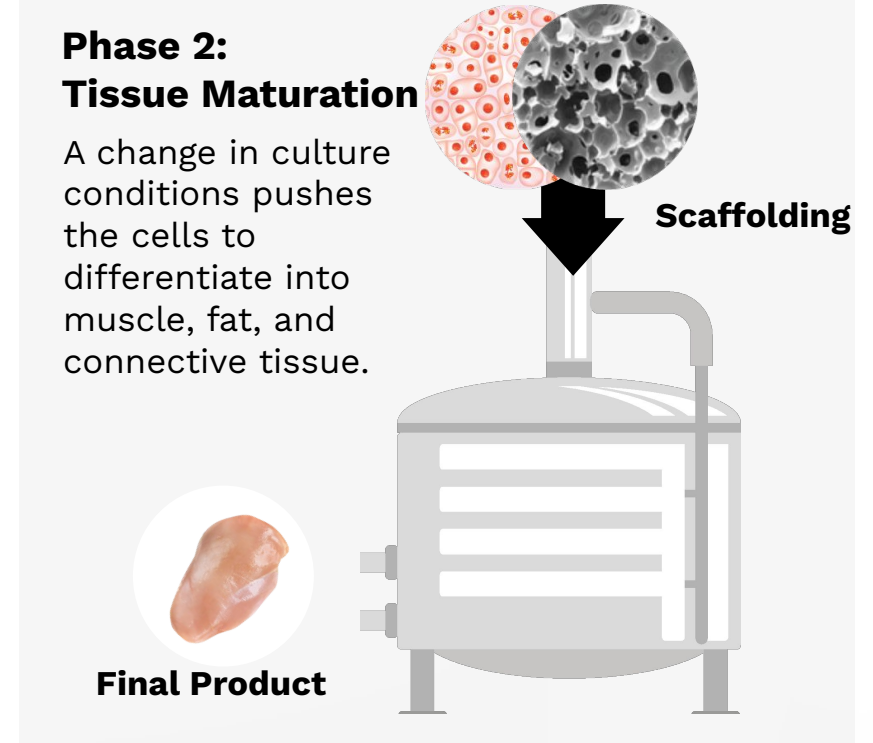
## Phase 1: Cell proliferation

The cells are added to a bioreactor along with cell culture media, which causes the cells to proliferate.



## Phase 2: Tissue Maturation

A change in culture conditions pushes the cells to differentiate into muscle, fat, and connective tissue.



**CELLS AT MATURATION**  
Primarily muscle, fat, and connective tissue.

**Fat Cell**



**Muscle Cell**













**Fibroblast Cell**





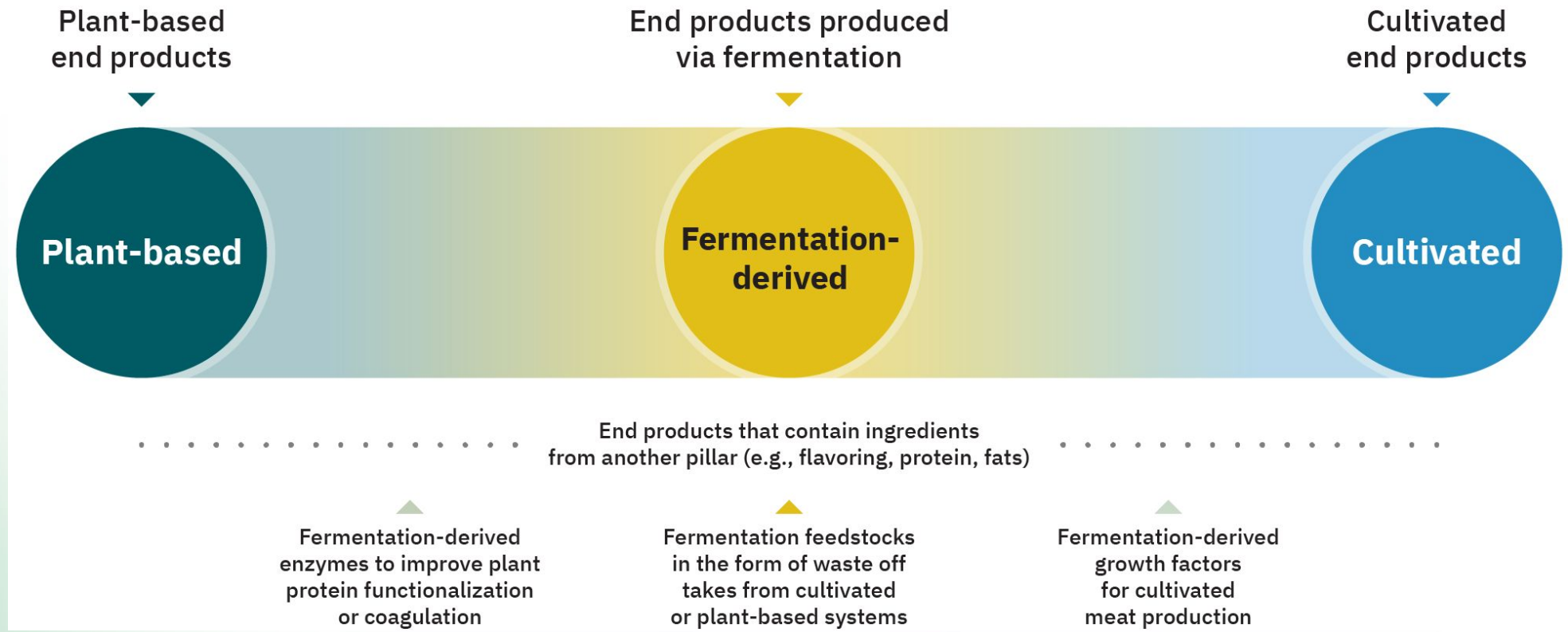
# The long-term comparative advantage of alternative proteins is higher production efficiency

Environmental impacts compared to plant-based meat	 Plant-based meat (made with wheat protein)	 Cultivated meat (made with renewable energy)	 Conventional chicken (ambitious benchmark)	 Conventional pork (ambitious benchmark)	 Conventional beef (ambitious benchmark, from dairy cattle)
 Land use	1x	8x	23x	30x	44x
 Water use	1x	28x	23x	20x	57x
 Air pollution	1x	10x	14x	20x	67x
 Toxic chemicals	1x	6x	6x	12x	55x
 Greenhouse gas emissions (CO <sub>2</sub> -eq)	1x	6x	7x	12x	41x

For GHG comparison to conventional beef production, cultivated meat's global warming benefits are best viewed as short-term, as beef's impacts are driven primarily by methane.

Source: GFI & CE Delft lifecycle assessment 2021. Note: The beef shown here is from dairy cattle. Beef from beef cattle is significantly more resource-intensive, with 70x as much GHG emissions compared to plant-based meat.

# Continued funding and innovation will drive alternative protein development along a spectrum



# Contact us



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