



qualiscape **mini**

A focused patent mini-landscape study on
alternate meat

Sample Report Template

Important Note: Visualizations and insights based on dummy data, prepared for illustration purpose only.

qualevia 

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one slide summary



Overview

2000 unique inventions identified in the last 10 years globally. Patenting is growing at a CAGR of 9%



Inventive geography

China and the United States lead the innovation



Family expansion

Protection sought in key markets such as China, United States, Japan, South Korea and Europe



Notable patents

Highly cited: US10172380B2
High filing breath: WO2020152689A1
Most categorized: US20240277004A1



Competitive

Fuji Oil holds the largest portfolio by volume followed by Corteva and Nestle



Notable new entrants

LeanMeat Corp. and Flavia are the new entrants with all filings post 2022



Academic presence

KAIST emerges in the top portfolios. UCLA, MIT are other key institutes researching



Collaborations

Fuji Oil, Corteva and Nestle are collaborating with global academia for lab-grown meat research



Technical

Wheat and lab-grown meat emerge as the leading sources, while 3D printing as the leading manufacturing process



Whitespace

Fungal sourced protein production using 3D printing



Top portfolio focus

Hybrid, Lab-grown meat, and Soy/Wheat as protein sources emerge as key focus areas



Litigation

No US litigations and EP oppositions were identified

project objective and scope

The project involves a study of published patent applications and granted patents related to “**alternate meat**” technologies. The study analysed global patent data available since January 1, 2014 based on earliest priority year.

The objective of the mini landscape is to identify the technology evolution, key players, key technical themes, and geographical distribution within the alternative meat domain.

Technical Scope

In-scope:

- Compositions and process of manufacturing:
 - Cultured meat
 - Meat substitutes
 - Plant/Microbes based meat alternatives

Out of scope:

- Conventional meat
- Meat packaging
- Quality testing

Geography

- Global, without any geographic restriction (*subject to availability of information on patent databases*)

Timeline

- Earliest priority date on or after January 1, 2014
- *Note the data is subject to availability of information on patent platforms used as per the discretion of the analyst*

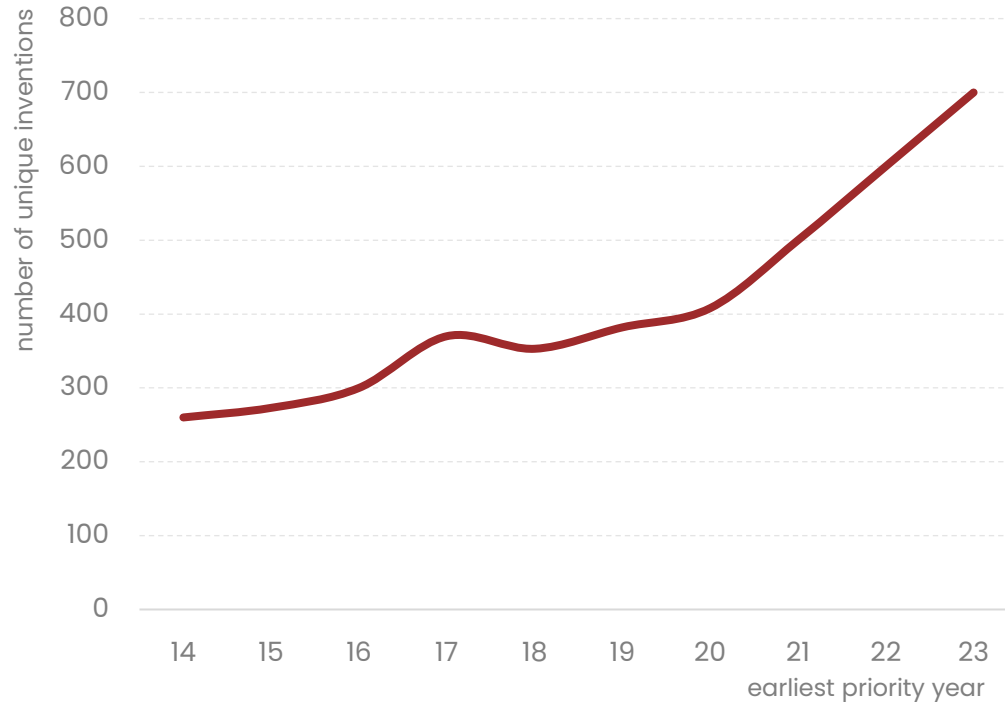
Taxonomy

- Sources: Soy, Wheat, Pea, Fungi, Algae & Seaweed, Insect, Hybrid, Lab-grown
- Process: Fermentation, Extrusion, 3D Printing

innovation evolution

Inventive activity timeline

Based on volume of unique inventions; 2014 onwards

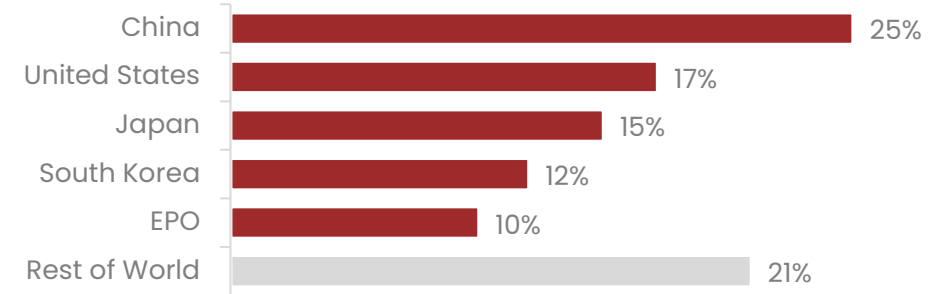


- Over past decade, the invention velocity in the alternate meat sector is growing at a 9% CAGR.
- A YoY exponential growth is expected to continue due to the market demand for sustainable meat owing to carbon emissions and ethical concerns over conventional approaches.

geographic insights

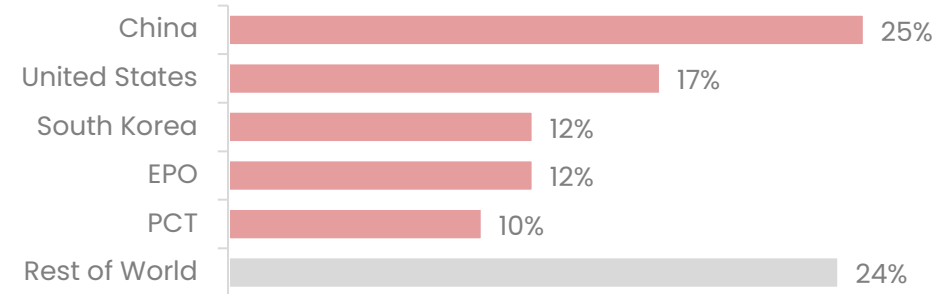
Distribution of invention location

Based on earliest priority country; 2014 onwards



Distribution of protection location

Based on family member publication country; 2014 onwards

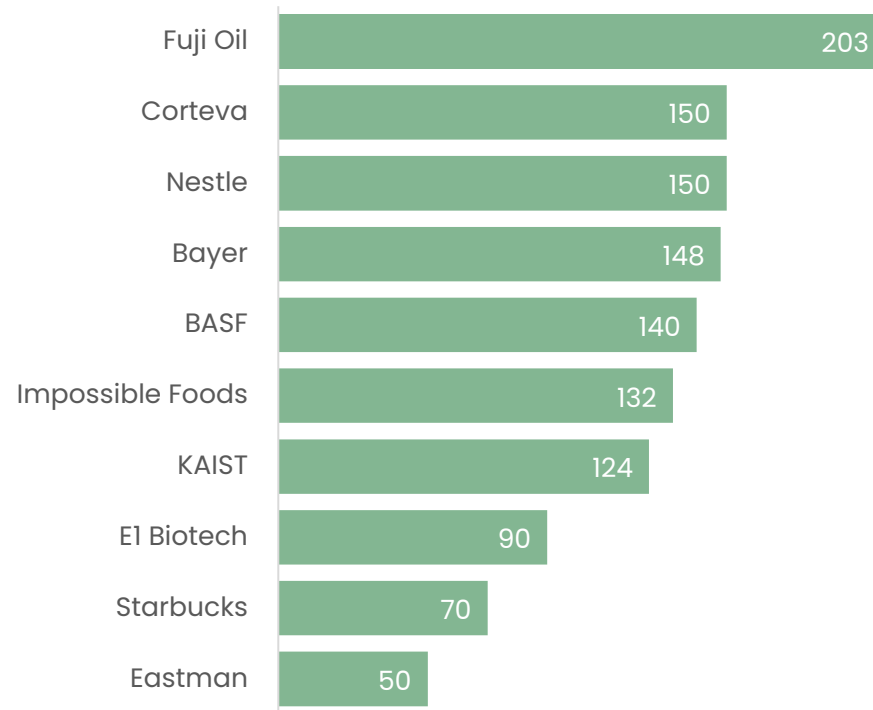


- Dominance of US and Europe shows mature innovation ecosystems and consumer demand.
- Rise in Asia-Pacific filings suggests emerging hubs and local demand.
- Companies are increasingly filing in high-consumption and high-growth markets.

competitive scenario

Top portfolios by volume

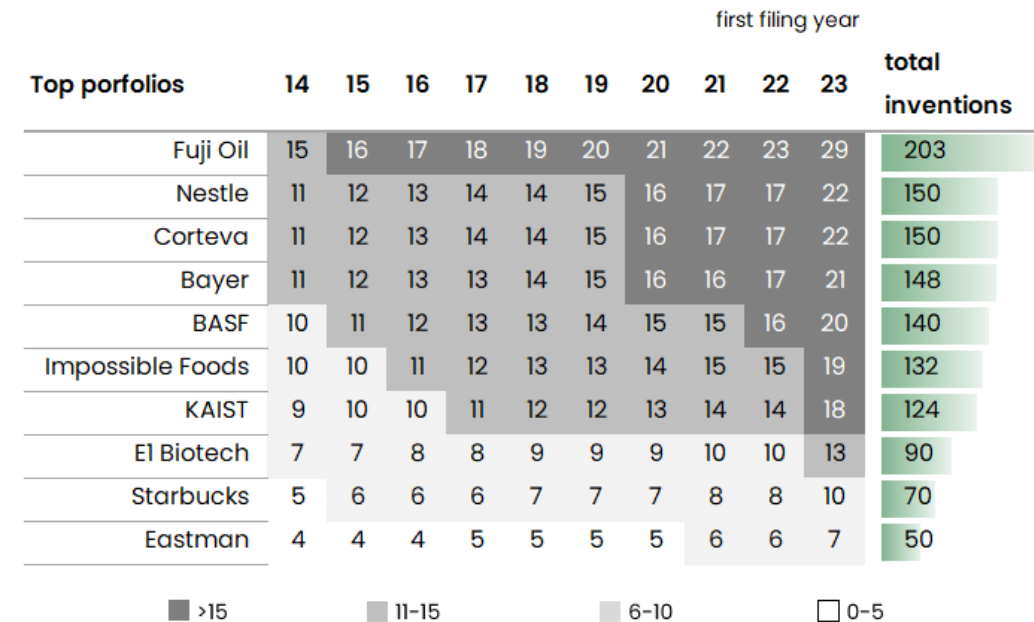
Based on volume of unique inventions; 2014 onwards



- Fuji Oil leads the list of top portfolios followed by Corteva and Nestle.
- KAIST, a leading Korean academic institute appears in the top portfolio list, focusing on microbial cell factory innovation.
- Other key entities include Bayer, BASF and Eastman. Starbucks is focusing on pea protein based solutions.

Top portfolio filing trend

Based on volume of unique inventions; 2014 onwards

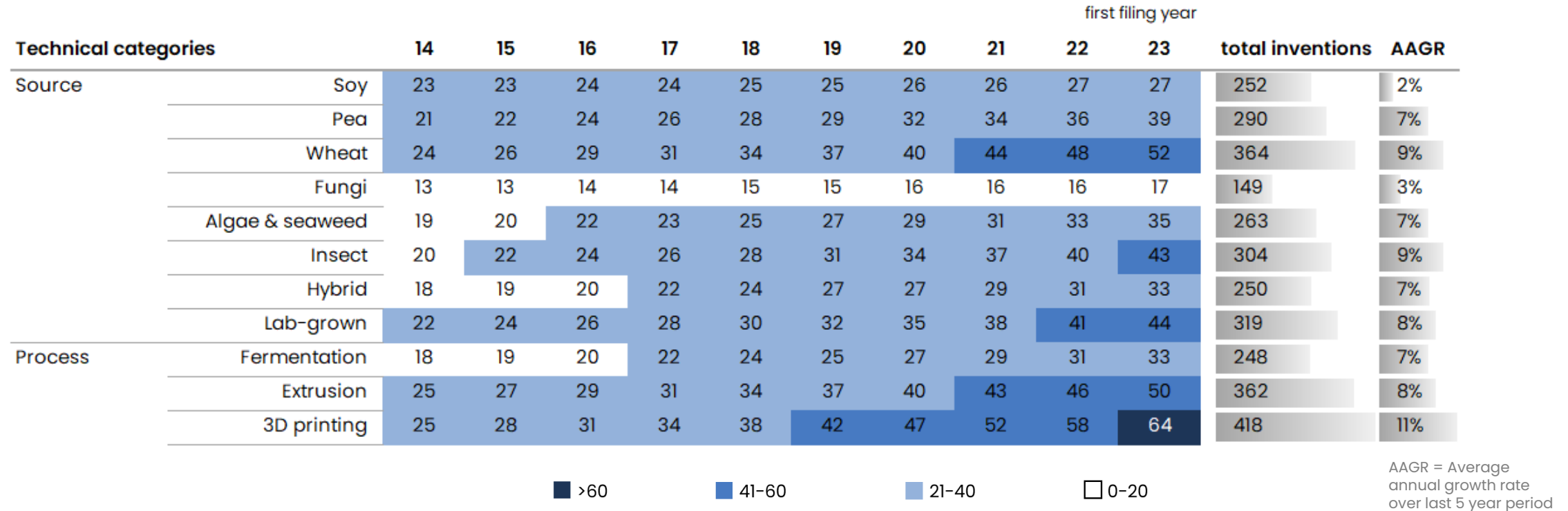


- Impossible Foods shows activity growth reflecting its rise as a leading disruptor in plant-based meat.
- Starbucks and Eastman show niche but consistent patent activity, suggesting focused innovation strategies.
- A mix of food giants, biotech firms, and academic institutions are shaping the patent landscape.

technology trends

Inventive activity in technology sub-segments

Based on volume of unique inventions, 2014 onwards



- 3D Printing shows the highest growth rate (11% AAGR), signaling rapid innovation in meat structuring technologies. Fermentation, and Extrusion are strong process areas, each with 250+ inventions and ~7-8% AAGR.
- Among sources, Soy remains dominant (252 inventions), but Wheat and Pea are seeing faster recent growth. Insect and Hybrid proteins are emerging, with notable activity since 2018, reflecting rising interest in alternative sustainable sources.
- Algae & seaweed and Fungi have modest but steady innovation, indicating niche but growing applications.
- Lab-grown meat crossed 300 inventions, showing strong industry investment in cell-based solutions.

technology correlation matrices

Technology co-occurrence matrix

Based on volume of inventions for each intersection, 2014 onwards

	Soy	Pea	Wheat	Fungi	Algae & seaweed	Insect	Hybrid	Lab-grown	Fermentation	Extrusion	3D printing
Soy	66	35	2	48	16	3	29	53	13	60	46
Pea	35	49	29	20	35	20	5	13	22	33	25
Wheat	2	29	65	59	22	33	2	52	43	15	27
Fungi	48	20	59	57	25	21	48	13	52	7	1
Algae & seaweed	16	35	22	25	66	17	19	26	35	45	50
Insect	3	20	33	21	17	66	37	25	39	48	25
Hybrid	29	5	2	48	19	37	65	53	40	56	18
Lab-grown	53	13	52	13	26	25	53	63	19	25	54
Fermentation	13	22	43	52	35	39	40	19	62	3	24
Extrusion	60	33	15	7	45	48	56	25	3	54	24
3D printing	46	25	27	1	50	25	18	54	24	24	66

- Soy + Extrusion emerges as the most dominant pairing, underlining its role as a backbone technology in plant-based meat structuring.
- Lab-grown meat technologies show strong co-occurrence with 3D printing and fermentation, indicating focus on scalable and high-precision manufacturing.

Top portfolios' technical distribution

Based on category volume by portfolio volume, 2014-onwards

	Soy	Pea	Wheat	Fungi	Algae & seaweed	Insect	Hybrid	Lab-grown	Fermentation	Extrusion	3D printing
Fuji Oil	5%	11%	9%	4%	1%	13%	9%	4%	7%	20%	8%
Nestle	14%	9%	10%	13%	12%	1%	16%	19%	15%	4%	11%
Corteva		1%	16%		8%	6%	17%	20%	14%	10%	9%
Bayer	20%	15%	7%	7%	18%	12%	4%	16%	1%	4%	10%
BASF	10%	12%	7%	9%	16%	15%	19%	18%	5%	20%	13%
Impossible Foods	12%	6%	18%	4%	17%	13%	2%	4%	2%	8%	9%
KAIST	2%	11%	7%	7%	15%	6%	16%	10%	10%	8%	9%
El Biotech	19%	3%	19%	3%	1%	18%	5%	19%	13%	12%	11%
Starbucks	15%	17%	13%	2%	12%	18%	2%	17%	2%	11%	11%
Eastman	11%	9%	12%	5%	11%	11%	10%	14%	8%	11%	10%

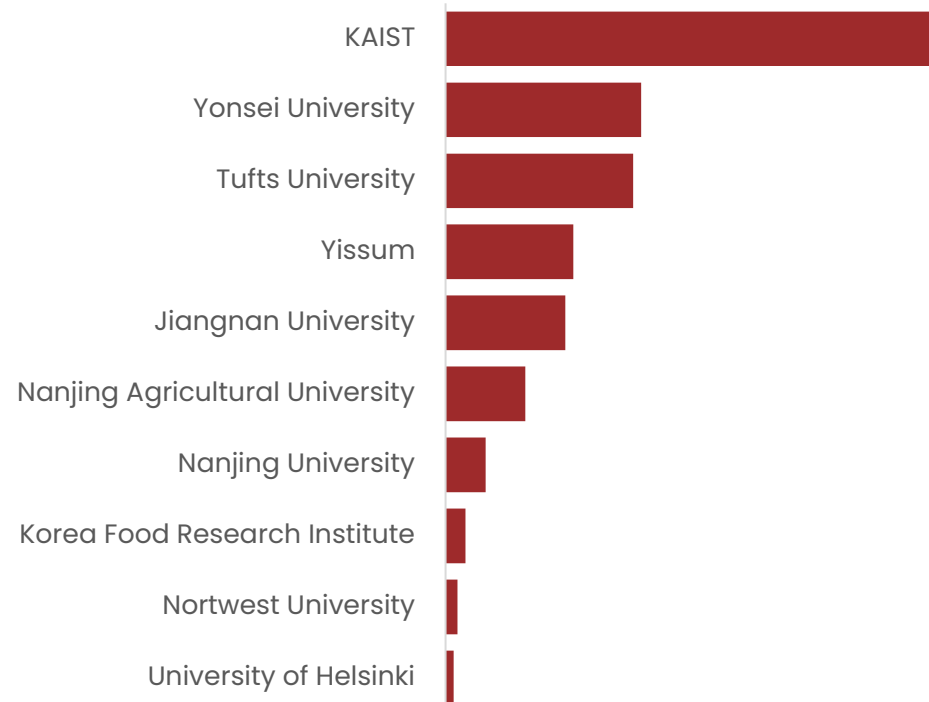
■ >15%
 ■ 11 - 15%
 ■ 1 - 10%
 no filings

- Fuji Oil and Bayer show strong focus on extrusion and fermentation, suggesting expertise in processing technologies for scalable production.
- Impossible Foods and Starbucks prioritize plant-based sources like pea, soy, and fungi, aligning with clean-label consumer trends.

top acad. institutions

Top 10 academic institutions

Based on volume of unique inventions; 2014 onwards

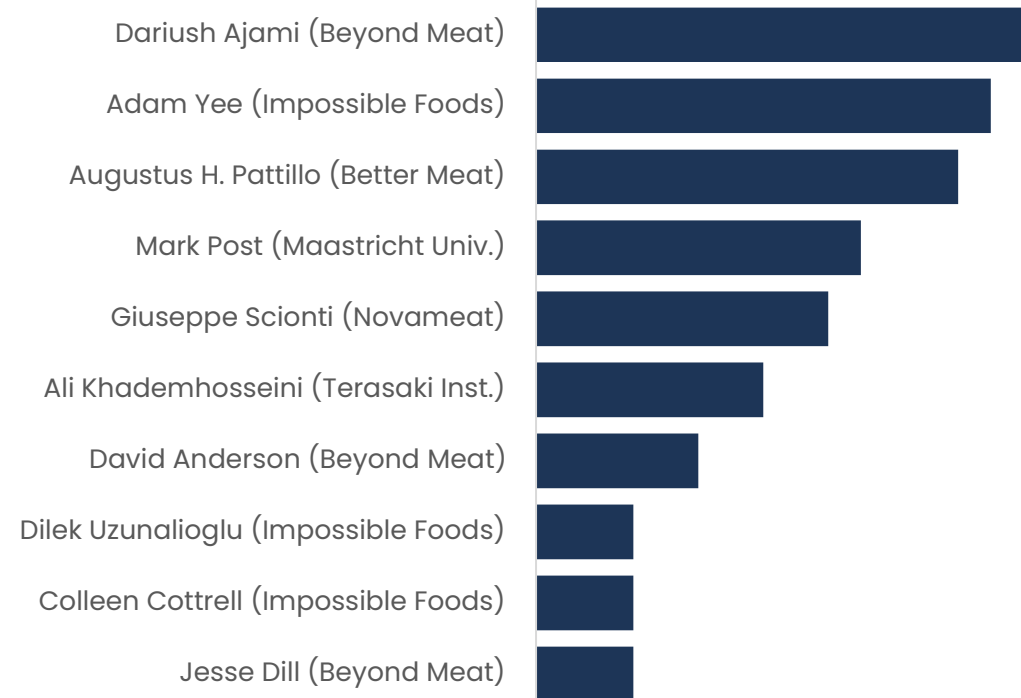


- KAIST leads significantly among academic institutions, showcasing strong research-to-patent conversion in alt-meat technologies.
- A global spread includes leaders from South Korea, USA, China, Israel, and Finland, reflecting widespread academic engagement.
- Institutions like Tufts, Yonsei, and Yisum are known for breakthroughs in lab-grown meat and fermentation-based innovations.

top inventors

Top 10 inventors

Based on volume of unique inventions, 2014 onwards



- Dariush Ajami (Beyond Meat) leads innovation efforts in plant-based meat structuring technologies. Adam Yee and team at Impossible Foods are actively shaping the IP landscape for plant-protein formulations.
- Inventors from startups, acad., and research inst. like Better Meat Co., Mosa Meat, and Terasaki Institute reflect a diverse innovation ecosystem across cultivated, fungal, and 3D-printed meat.

notable patent families

Most Cited Patent

US10172380B2: Impossible Foods

The patent is related to relates to plant-based ground meat replicas that mimic ground meat on the fibrousness, heterogeneity in texture, beefy flavor, and red-to-brown color transition during cooking of ground meat.

The patent was filed on March 31, 2015, and has received a total of 134 citations.

The citing entities are Alpine Roads, Pioneer Hi-Bred, DSM, etc.

[Link to open the patent>>](#)

Highest Filing Breath

WO2020152689A1: Redefine Meat

The PCT publication is related to a meat analogue that comprises a protein-based component and a fat-based component separately distributed within the meat analogue.

The published application was filed on January 26, 2019

The publication has been filed in 12 jurisdictions, and further pending validation in EP contracting states.

[Link to open the patent>>](#)

Most Categorized

US20240277004A1: Air Protein

The patent is related to structured food compositions for human or animal consumption closely mimicking the properties of meat and function as meat analogue products.

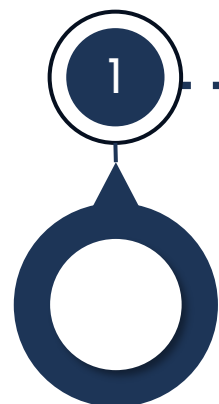
The patent was filed on November 27, 2023

The patent has been categorized under all protein source categories and a few manufacturing techniques. (9)

[Link to open the patent>>](#)

market insights

Market Potential

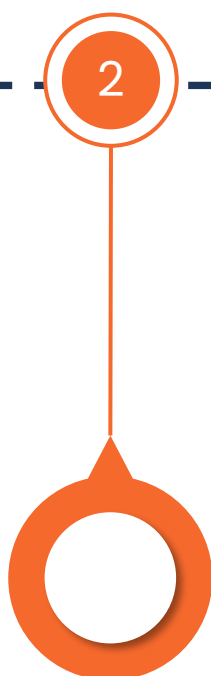


Plant meat market to exceed \$15.7B by 2027 globally.

\$500M+ investments globally, 150+ startups working in this segment.

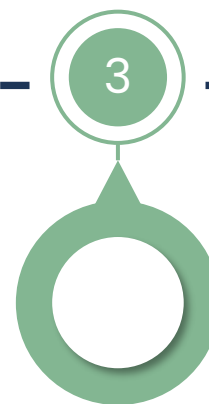
Asia-Pacific: fastest-growing driven by food security concerns and sustainability targets.

Market Growth



Consumer demand is increasingly driven by flexitarians and Gen Z, prioritizing climate-friendly and ethical foods.

Regulatory



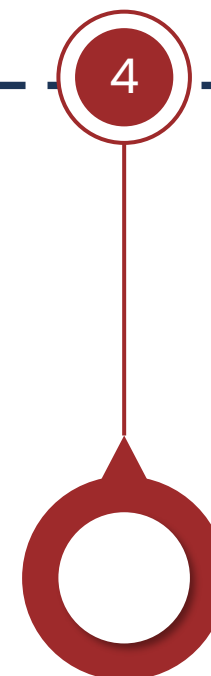
FDA and USDA share oversight of cultivated meat

Many states in the US prohibit the sale/manufacture of lab-grown meat.

Plant-based products face labeling restrictions - e.g., bans on using terms like "meat" or "burger".

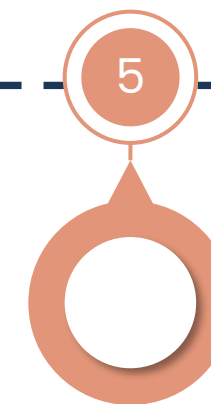
Singapore is the first country globally to approve cultivated meat sales.

Challenges



Texture, price, and health perceptions remain key barriers to wider adoption.

Corporate Action



Impossible Foods launched new SKUs (chicken, chorizo) and aims to go public after turning profitable.

Beyond Meat faces declining sales in the US, shifting focus to international markets.

Steakholder Foods and Aleph Farms are expanding across Asia-Pacific through partnerships and JVs.

methodology and glossary

METHODOLOGY

01 Building the patent dataset: The raw patent dataset will be created using standard searching techniques and would undergo quality review for comprehensiveness. The search strategies would be designed using relevant keywords/phrases to search the title, abstract and claims, along with relevant patent classification codes.

The patent collection would be limited to last 10 years based on earliest priority, without any geographic limitation.

The patent collection would be limited to a single representative per simple family.

02 Data denoising: Any off-topic references captured due to coincidental combination of keywords would be removed using sub-searching techniques.

03 Assignee standardization: Top assignee names would be standardized considering name variations, and subsidiaries information.

04 Taxonomy generation: A taxonomy of up to 10-15 categories would be developed in consultation with the client. The taxonomy design would consider materials, processes, systems, novelty, advantages, and applications.

05 Data segmentation: The patent dataset will be divided into sub-categories based on client-approved taxonomy using sub-searching techniques. Focused search strategies would be prepared for each sub-category using a combination of keywords and patent classifications. The categorized dataset will be quality reviewed. A single record can be categorized into more than one sub-category.

06 Metadata and visualization: The categorized patent dataset will be used to create metadata and visualized through charts, tables, and graphs for actionable insights.

07 Report generation: The analyst will create an MS PPT report with visualizations and key insights.

GLOSSARY

Patent: A legal document granting the inventor exclusive territorial rights to an invention for a specified period, typically 20 years, in exchange for public disclosure.

Taxonomy: A structured classification system used to categorize inventions based on shared characteristics.

Invention: A simple patent family containing publications all claiming the same inventive aspects.

Earliest priority date: The first filing date of a patent application, establishing the priority for subsequent applications for the same invention.

Innovation location: The geographical region where an invention was first conceived.

Protection location: The country or jurisdiction where a patent has been filed to protect an invention.

Assignee: The individual or company that owns the rights to a patent, often the applicant or a subsequent owner.

Publication lag: The time between the filing of a patent application and its public disclosure, typically 18 months from earliest priority date.

PCT/WIPO: The Patent Cooperation Treaty is an international treaty administered by the World Intellectual Property Organization that allows applicants to seek patent protection in multiple countries with a single application.

EPO (European Patent Organization): A regional patent office that grants European patents, which can be validated in multiple European countries.

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