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Novel foods

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Novel foods

Details of the Deep Dive

Topic: Novel foods, alternative proteins

Thematic area(s): Novel foods

Keyword(s): cell culture-derived foods, novel food as food supplements, novel carbohydrates, alternative sources of proteins

Query: "novel food" OR "alternative protein" AND (meat OR culture OR cell OR supplement OR carbohydrate OR insect OR fibre OR milk)

Timeframe: 2023-present

A. Deep dive general introduction

Novel foods are defined under [EU regulation](#) as foods and food ingredients that have not been significantly consumed by humans in the European Union before May 15, 1997. These can include newly developed, innovative foods, or foods produced using new technologies and production processes, as well as foods traditionally consumed outside the EU. According to EFSA, the key categories of novel foods include:

- Foods from new or unconventional sources, such as plants, fungi, or microorganisms.
- Foods derived from new production processes (e.g., innovative farming methods or biotechnological advancements).
- Substances newly introduced to the diet, like vitamins or minerals in newly bioengineered forms.

Before novel foods can be placed on the European market, they must undergo a comprehensive safety assessment by EFSA to ensure they pose no health risks to consumers.

Alternative proteins, a subset of novel foods, refer to protein sources that do not come from traditional animal farming. These include:

- **Plant-based proteins**, derived from crops like peas, soy, or lentils.
- **Insect-based proteins** considered a highly sustainable option due to their efficient use of resources.
- **Cultivated (lab-grown) meat**, created from animal cells in a controlled environment.
- **Fermentation-based proteins**, where microorganisms produce protein-rich food components.

This deep dive aims to provide a comprehensive understanding of the potential concerns and issues related to novel foods and alternative proteins, with a focus on the work of EFSA's partners and stakeholders, by examining pertinent research and data from January 2023 to September 2024. This review aims to place particular emphasis on the perspectives of stakeholders, alongside regulatory advancements, and their implications for consumer safety.

B. Distilled information

B.1 Key actors position as identified by EFSA

Cellular Agriculture Europe: Cellular Agriculture Europe criticizes the [Italian Parliament's](#) ban on cell-cultured products, which bypasses EU Novel Foods Regulation requiring safety assessments and approval from EFSA and the European Commission. This move undermines innovation, restricts consumer choice, and isolates Italy from emerging sustainable food industries with economic and environmental benefits. Cellular Agriculture Europe urges the European Commission to enforce EU laws consistently to support innovation and safeguard market integrity. (Europe C. A., 2023)

Eurogroup for Animals: The Eurogroup for Animals highlights concern about the scalability, sustainability, and welfare implications of the rapidly growing insect farming industry, with a focus on animal feed rather than human consumption. Austria's Agriculture Minister challenges the sustainability of cultivated meat and advocates against labelling it as "meat," a stance supported by several Member States despite Intergovernmental Panel on Climate Change (IPCC)-backed environmental benefits. Ethical concerns over Foetal Bovine Serum in meat cultivation persist, though alternatives are emerging. (Animals, 2023) (Animals, 2024)

European Federation of Associations of Health Product Manufacturers: The European Federation of Associations of Health Product Manufacturers (EHPM) raises concerns about the fragmented implementation of the EU's Novel Food Regulation, which hampers investment, innovation, and legal certainty in the food supplements sector. EHPM advocates for harmonized legislation to foster industry growth and consumer safety. Issues such as the retrospective classification of foods as novel and inconsistent interpretations by member states threaten industry trust and consumer confidence. (Manufacturers, 2024a) (Manufacturers, 2024b) (Manufacturers, 2023)

European Food Information Council: The European Food Information Council discusses alternative proteins like plant-based analogues, cultured meat, insects, algae, and microbial products as promising for sustainable food systems, but notes challenges in production, processing, and consumer acceptance. Significant innovation, public funding, and regulatory compliance are essential for scalability and market integration. Ethical concerns, such as the use of fetal bovine serum in lab-grown meat, and high energy demands, particularly for lab meat, pose additional challenges. While microalgae like *Galdieria sulphuraria* show potential as protein sources, regulatory approval and digestibility issues remain. (Council, 2023a) (Council, 2023b) (Council, 2023c) (Council, 2023d) (Council, 2024)

Federal Agency for the Safety of the Food Chain: The Federal Agency for the Safety of the Food Chain (AFSCA) discusses the growing interest in using insects as a sustainable protein source for animal feed in Europe, driven by the continent's protein deficiency and sustainability goals. Regulatory shifts in 2021 allowed insect-based processed animal proteins (PAP) for use in aquaculture, poultry, and porcine diets under strict conditions. Insects used in feed must comply with stringent dietary regulations to ensure safety. The integration of insects highlights sustainability challenges and regulatory complexities but offers potential for supporting Europe's environmental objectives. (Chain, 2023)

German Federal Office of Consumer Protection and Food Safety: The German Federal Office of Consumer Protection and Food Safety (BVL) report from the Head of Agencies' working group addresses regulatory gaps in the EU concerning substances with nutritional or physiological effects used in food supplements. These substances lack a uniform regulatory list across member states, risking consumer safety and complicating trade. After evaluating 117 substances, the group recommended creating a controlled list, using the 'Article 8 procedure' for potential health risks. This would enhance consumer protection and regulatory clarity. (Lebensmittelsicherheit, 2024)

German Federal Institute for Risk Assessment: The German Federal Institute for Risk Assessment (BfR) expresses concern about potential allergic reactions from insect-based foods, following the EU's authorization of yellow mealworms and other insect species for consumption. While no severe allergic reactions have been documented in Germany, there is limited data on the allergenic potential of insect proteins in Europe. BfR advocates for thorough risk assessments to ensure consumer safety as insect-based foods gain market presence. (Risikobewertung, 2023)

International Platform of Insects for Food and Feed: The International Platform of Insects for Food and Feed (IPIFF) supports new EC regulations allowing the use of frozen and freeze-dried lesser mealworms in food products, marking a milestone for insect-based foods. Alongside the approval of partially defatted whole house crickets, this reflects growing regulatory support. A survey shows increasing consumer acceptance of insect-enriched foods, particularly among health-conscious adults, driven by taste, health benefits, and sustainability. IPIFF also advocates for integrating the insect sector into the Common Agricultural Policy to enhance food security. (Feed, 2023) (Feed, 2024a) (Feed, 2024b) (Feed, 2024c) (Feed, 2024d)

International Probiotic Association: The International Probiotic Association (IPA) and the European Food and Fermentation Cultures Association (EFFCA) have updated their members about changes to the EC's Novel Food Catalogue, aiming to clarify the status of foods under the novel food regulation. They have advocated since 2018

for assessing novelty at the species level to refine evaluations but raised concerns over unlisted food cultures. Both organizations are pushing for more detailed classifications to enhance transparency and regulatory compliance. (Europe I. P., 2024)

New Zealand Ministry for Primary Industries: In March 2024, New Zealand's Ministry for Primary Industries (MPI) issued a policy supporting the production and sale of cell-cultured meat, aligning with global trends in diversifying protein sources. The policy emphasizes strict safety, nutritional standards, and transparency, requiring businesses to undergo pre-market approval and comply with regulations on cell sourcing, waste disposal, and labelling. Antibiotic use is discouraged to reduce antimicrobial resistance risks. The policy supports innovation while ensuring consumer protection and aligns with national dietary guidelines. (Industries, 2024a) (Industries, 2024b) (Industries, 2023) (Industries, 2024c)

Spanish Agency for Food Safety and Nutrition: The Spanish Agency for Food Safety and Nutrition, along with the Complutense University of Madrid, critically assesses the EU's regulatory framework for novel foods, highlighting inconsistencies in safety specifications for products approved after May 1997. Despite centralized EFSA oversight, the document emphasizes variations in standards for composition, contaminants, and microbiological criteria, which could compromise safety. The authors call for more precise and updated analytical methods and regulations to ensure novel foods are consistently safe. (Nutrition, 2024)

The Good Food Institute Europe: Seth Roberts from the Good Food Institute (GFI) Europe highlights the potential benefits of this innovation, emphasizing sustainability, ethical practices, and economic growth. The document cites the French startup Gourmey that has submitted the first application for cultivated meat authorization in the EU, specifically for cultivated foie gras, marking a significant milestone in the alternative protein industry. It is underlined that rigorous safety and nutritional evaluations are planned as consumer acceptance of cultivated meat grows in Europe. (Europe T. G., 2024a) (Europe T. G., 2023a) (Europe T. G., 2024b) (Europe T. G., 2023b) (Europe T. G., 2024c) (Europe T. G., 2023c) (Europe T. G., 2024d) (Europe T. G., 2023d)

Four Paws International: FOUR PAWS supports cultivated meat as a promising innovation to reduce animal suffering in intensive farming systems and promote more humane, sustainable food production. However, this endorsement is contingent on eliminating animal-derived components, like Fetal Bovine Serum, from the production process. While acknowledging the potential of cultivated meat, FOUR PAWS remains cautious about its long-term impacts and advocates for reduced animal product consumption, promoting plant-based diets as the most animal-friendly option. (International, 2023)

Singapore Food Agency: The Singapore Food Agency (SFA) emphasizes a science-based regulatory framework for novel foods, focusing on alternative proteins like cell-based meats and precision fermentation products. SFA's approach ensures food safety through pre-market risk assessments and collaboration with industry, consumers, and academia. A Novel Food Safety Expert Working Group supports these assessments with expertise in food science and toxicology. SFA's proactive role in international collaborations and risk communication ensures alignment with global safety standards. (Agency, 2023)

CGIAR System Organization: The CGIAR document critically examines the challenges the EU faces in transforming its food system through the Farm to Fork and Biodiversity Strategies under the Green Deal. It highlights the environmental impacts of current food systems, such as biodiversity loss and pollution, and stresses the difficulty in implementing sustainability policies due to governance complexities, lack of clear definitions, and conflicting goals. The authors advocate for an integrated approach combining regulations, incentives, and investment to support sustainable agriculture and consumer education. (Organization, 2023)

Food and Agriculture Organization of the United Nations: The Good Food Institute (GFI) raises concerns about the Codex Committee's proposed guidelines for plant-based and alternative proteins, initiated by the U.S. and Canada. GFI argues that aligning these products with the nutritional profiles of animal products is inappropriate and could restrict consumer choice and innovation. They emphasize that alternative proteins should not be forced to mimic animal-derived products and suggest addressing nutritional differences through innovation. GFI advocates for broader strategic discussions and universal guidelines for all foods to ensure fair trade and avoid disproportionately impacting the alternative protein sector. (Nations, 2023a) (Nations, 2023b) (Nations, 2023c) (Nations, 2024d) (Nations, 2023e) (Nations, 2023f) (Nations, 2023g)

Health Canada: Health Canada's consultation on novel food regulations revealed stakeholder concerns over clarity, regulatory oversight, and safety, particularly for gene-edited plants and GM products. Industry representatives and academics requested clearer definitions to avoid confusion, especially regarding pre-market notifications and the voluntary transparency initiative. There is debate over allowing developers more autonomy versus maintaining strict government oversight to ensure product safety. Transparency and mandatory labelling of GM foods were emphasized to build public trust. (Canada, 2024a) (Canada, 2024b) (Canada, 2024c) (Canada, 2023) (Canada, 2024d)

The Organisation for Economic Co-operation and Development: The OECD report on novel foods and alternative proteins, covering June 2022 to April 2023, emphasizes the importance of international collaboration in enhancing food safety protocols. The report highlights global efforts to update regulatory frameworks for novel foods, GMOs, and edible insects to meet the challenges of emerging food technologies. Continuous knowledge exchange and harmonized safety assessments are key to promoting global food security. The report calls for ongoing research, public engagement, and dynamic regulatory frameworks to accommodate advancements in food production. (économiques), 2023) (économiques), 2024)

United States Department of Agriculture: The USDA report summarizes the OECD's analysis on the global regulation and safety assessment of novel foods, including genetically engineered products and alternative proteins like edible insects. Covering June 2022 to April 2023, the report highlights the importance of international collaboration, led by organizations like the OECD and FAO, to harmonize safety standards and adapt regulatory frameworks to emerging food technologies. It emphasizes the need for continued research, public engagement, and global cooperation to address the complexities of novel foods while maintaining safety. (Agriculture, 2023a) (Agriculture, 2023b) (Agriculture, 2024) (Agriculture, 2023c)

Wageningen University & Research: Wageningen University & Research explores insects as a sustainable alternative protein for human consumption and animal feed, addressing global food demand challenges. Insects offer environmental and economic benefits, such as lower feed requirements and reduced greenhouse gas emissions, making them a viable alternative to traditional livestock. However, safety concerns include pathogen risks, heavy metal accumulation, and allergens. Insects are classified as novel foods in Europe, requiring EFSA approval. Since 2017, insect proteins have been used in aquaculture, and later in poultry and pig feed, with ongoing research addressing safety and regulatory issues. (Research, a) (Research, b) (Research, c) (Research, d) (Research, 2024)

B.2 Additional position of non-key actors

In this section we included additional information from non-actor organisations that emerged during the search. Other sources have been consulted but not reported for sake of clarity.

EPRS - European Parliament Research Service: The EPRS report addresses challenges and opportunities in the EU's alternative protein sector, highlighting issues like production costs, taste, texture, safety, and environmental impact. Key concerns include the lack of scalable production infrastructure and high energy costs associated with current methods. The report recommends enhancing protein production with a lower environmental footprint and integrating environmental considerations into regulatory risk assessments for novel foods. It also notes that Small and Medium Enterprises (SMEs) struggle with meeting stringent EU regulations. Solutions focus on non-regulatory measures, such as public funding and subsidies, alongside a governance framework to ensure consumer acceptance and sustainability goals. The message is positive, emphasizing innovation and sustainability, but recognizes the need for improvements in infrastructure and regulatory support. (Service, 2024)

BIOSAFE: The BIOSAFE report highlights the challenges posed by the EU's stringent regulatory framework for novel foods, which requires detailed safety assessments and strict compliance. While this creates barriers for new companies entering the market, it ensures consumer health and high safety standards. Despite these hurdles, the novel food sector, particularly fermentation-based alternative proteins, is growing rapidly. Investment surged from \$5 million in 2013 to \$587 million in 2020, reflecting optimism about the sector's potential. Though many novel foods are still in development, their increasing market presence suggests a shift towards more sustainable and diverse food systems. The message is positive, acknowledging both challenges and growth opportunities. (BIOSAFE, 2024)

THE STRAITSTIMES: It is reported that the National University of Singapore (NUS) launched Asia's first Bezos Centre for Sustainable Protein, backed by a \$39 million contribution, to advance hybrid meats and fermented proteins like mycelium and microalgae. These proteins aim to mimic the taste and nutrition of animal products without health downsides. Despite challenges, especially in cultivated meat—such as scalability and contamination risks in bioreactors—the centre focuses on improving production methods. By collaborating with food-tech companies, the centre aims to enhance safety, nutrition, and consumer acceptance of alternative proteins. The message is positive, focusing on innovation and collaboration to improve sustainability and scalability in the food industry. (STRAITSTIMES, 2024)

Food ingredients 1st: It is reported that the EU is close to approving UV-treated yellow mealworm powder as a novel food, following a positive safety and nutritional assessment by EFSA. Nutri'Earth, the company behind the application, aims to market this versatile ingredient in products like bread, pasta, and mashed potatoes. UV treatment enhances the mealworm powder's vitamin D3 content, addressing nutrient deficiencies without affecting its proteins, fatty acids, and minerals. If approved, the product would diversify protein sources in line with the EU's Protein Strategy. While the approval process is ongoing, stakeholders are optimistic, and consumer acceptance appears positive due to its neutral impact on food characteristics. The message is positive, focusing on sustainability and innovation in the edible insect sector. (ingredients, 2023)

European Biotechnology: The Cultivated B, a subsidiary of InFamily Foods in Germany, has pre-registered a hybrid meat product with EFSA for approval, marking a significant move into the novel food sector. This hybrid hot dog, combining plant protein and pork from cell cultures, is part of the company's shift away from traditional meat due to declining demand. While the EU approval process is lengthy compared to regions like Singapore and the U.S., innovative Dutch regulations allow early tasting of such products. Industry leaders see these developments as key milestones but note the need for further advancements, particularly in eliminating the use of fetal bovine serum for more sustainable production. The message is positive, acknowledging progress but emphasizing the need for continued innovation. (Biotechnology E. , 2023)

Sustainable Brands: The UK Edible Insect Association (UKEIA) and the University of Sheffield's Institute for Sustainable Food advocate for revised UK regulations to boost the edible insect industry, post-Brexit. They argue current regulations, modelled after stringent EU rules, are hindering the sector's growth despite insects' low environmental impact and potential as a sustainable protein source. The report calls for balanced, science-based standards and licensing frameworks to promote innovation while ensuring consumer safety. It also stresses the need for public education to overcome cultural resistance to insect-based foods and integrate them into mainstream diets. The message is positive, highlighting both the environmental benefits and the potential for regulatory reform to support sustainability goals. (Brands, 2024)

C. Monitoring timelines

The time period covered by the following deepening is from 1 January 2023 to 27 September 2024.

D. Key actors and roles

Actor	Position towards novel food and alternative proteins
Cellular Agriculture Europe	Highly positive
Eurogroup for Animals	Slightly negative
European Federation of Associations of Health Product Manufacturers	Slightly positive
European Food Information Council	Slightly positive
Federal Agency for the Safety of the Food Chain	Neutral
Federal Office of Consumer Protection and Food Safety	Slightly positive
German Federal Institute for Risk Assessment	Slightly negative
International Platform of Insects for Food and Feed	Highly positive
International Probiotic Association - Europe	Slightly positive
Ministry for Primary Industries	Slightly positive
Spanish Agency for Food Safety and Nutrition	Neutral

The Good Food Institute Europe	Highly positive
Vier Pfoten International	Slightly positive
Singapore Food Agency	Slightly positive
CGIAR System Organization	Slightly positive
Food and Agriculture Organization of the United Nations	Slightly positive
Health Canada	Neutral
The Organisation for Economic Co-operation and Development	Slightly positive
United States Department of Agriculture	Slightly positive
Wageningen University & Research	Slightly positive

E. Key insights and recommendations

E.1 Regulatory challenges and recommendations

Bans on cell-cultured products: Concerns have emerged about bans on cell-cultured products that bypass necessary safety regulations, potentially limiting innovation and consumer choice. Consistent regulation across the EU is needed to support growth and innovation in the sector.

Fragmented novel food regulations: Fragmented regulations around novel foods and supplements create uncertainty for investment and innovation. Harmonized legislation is required to boost safety, promote industry growth, and enhance consumer confidence.

Need for clearer classifications: Greater clarity is needed in regulatory guidelines, especially for products developed internationally versus domestically, to avoid hindering innovation. This includes the need for consistent classifications and updated safety regulations.

Evolving regulatory landscape: The regulatory landscape for novel foods is evolving to keep pace with technological advancements. Safety, transparency, and public trust are key, making pre-market risk assessments essential for these emerging products.

Global collaboration: Global collaboration is crucial for harmonizing safety standards and updating regulatory frameworks for novel foods, alternative proteins, GMOs, and edible insects. Harmonization will support safety, consumer protection, and market development.

E.2 Safety and consumer protection

Pre-market risk assessments: The need for pre-market risk assessments is highlighted to ensure consumer safety as novel foods and alternative proteins enter the market. This is crucial for building public trust.

Allergenic potential of insects: Concerns have been raised about the allergenic potential of insect-based foods, especially regarding cross-reactivity with common allergens like crustaceans and house dust mites. Thorough risk assessments and further research are needed to address these concerns.

Pathogen and contaminant risks: Insect farming and insect-based foods require safety considerations, including pathogen risks, heavy metal accumulation, and compliance with strict regulatory standards to ensure consumer protection.

E.3 Alternative proteins and their challenges

Sustainability and scalability of insect farming: Insect farming is recognized for its potential as a sustainable protein source. However, scalability, sustainability, and ethical issues, particularly regarding animal welfare, remain challenges. Consumer acceptance of insect-enriched foods is growing, driven by health and environmental benefits.

Lab-grown meat: Alternative proteins like lab-grown meat show promise for sustainability, but there are significant challenges regarding production, processing, consumer acceptance, and ethical issues related to the use of animal-derived components, such as foetal bovine serum, in the production process.

Regulatory support for insect integration: Regulatory approval for insect proteins is expanding, supporting their use in animal feed and potentially in human diets. Integration into agricultural policies is key for enhancing food security, but ongoing research is needed to address safety concerns and ethical considerations.

E.4 Innovation and market growth

Harmonized regulations to foster growth: Fragmented regulations create uncertainty, which hampers industry growth and innovation. Harmonized legislation is recommended to ensure safety, promote industry growth, and enhance consumer confidence.

Consumer acceptance: Consumer acceptance of alternative proteins, particularly insect-enriched foods, is growing, driven by perceived health and environmental benefits. Public education and awareness campaigns can help further integrate these products into mainstream diets.

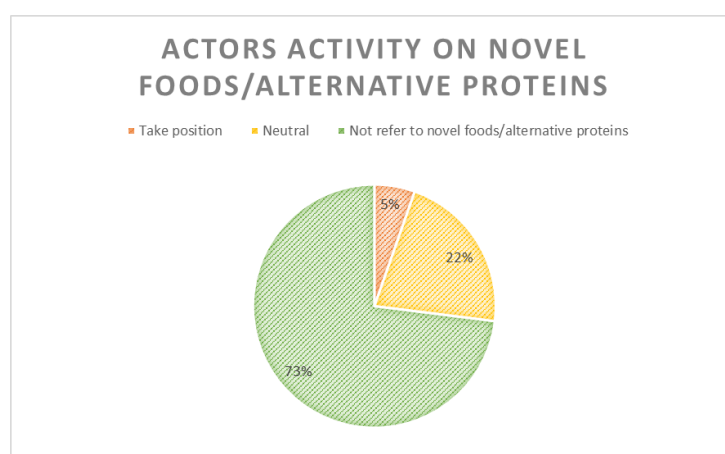
Public funding and incentives: The need for public funding, subsidies, and incentives is highlighted to support infrastructure development and ensure consumer acceptance of alternative proteins. Innovation must be encouraged through strategic incentives and support mechanisms.

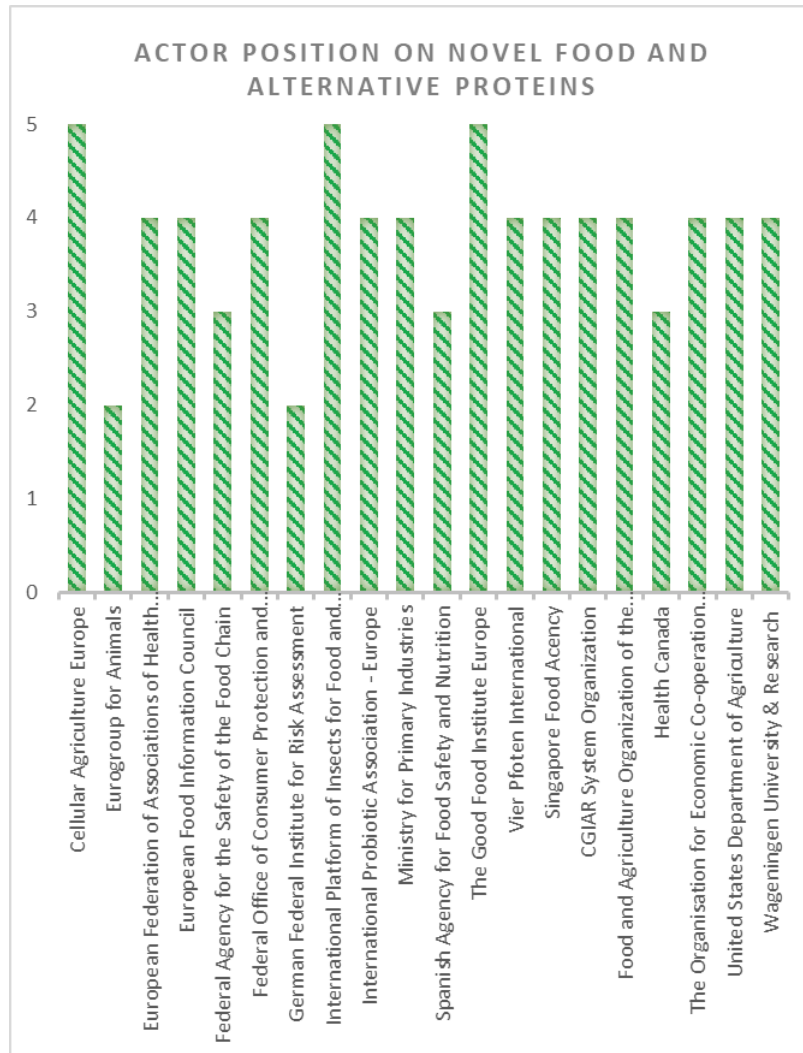
E.5 Integrated approaches for sustainability

Challenges in food system transformation: Transforming food systems toward sustainability requires integrated approaches combining regulation, incentives, and public education to achieve meaningful change. Addressing governance complexities and ensuring clear definitions are crucial to implementing sustainability policies effectively.

Environmental benefits and research needs: Insects offer significant environmental and economic benefits as an alternative protein source, requiring lower feed inputs and producing fewer greenhouse gases. However, ongoing research is necessary to address contamination risks and improve production methods.

F. Document analytics





Data are reported accordingly to the following:

- 5- Strongly Positive
- 4- Somewhat Positive
- 3- Neutral
- 2- Somewhat Negative
- 1- Strongly Negative

The heat map view in the graph below illustrates the involvement of actors in various aspects of novel foods. The left side of the page is a vertical catalogue of organisations, while the top of the page is a horizontal arrangement of novel food areas. The following sectors are included: cultured meat, edible insects, food supplements, alternative proteins, algae, fermented foods, animal by-products (SPA), novel foods, and plant products.

The shading of the cells indicates the extent of each organization's involvement in a specific sector. The darker the tint, the more active the organisation is in that sector. For example, the "*International Platform of Insects for Food and Feed*" exhibits substantial involvement in the edible insects sector, as evidenced by the intensely shaded cell. Organisations such as "*The Good Food Institute Europe*" exhibit a wide range of interests, engaging in a variety of fields, such as fermented foods, alternative proteins, and cultivated meat. In contrast, certain organisations, such as the "*Singapore Food Agency*," exhibit limited or specific involvement, as evidenced by the limited number of sectors that are actively engaged.

This type of visualisation is essential for rapidly determining which organisations are most engaged in specific novel food sectors and which sectors are attracting the attention of multiple organisations.

ORGANIZATION/NOVEL FOOD AREA	Cultivated meat	Edible insect	Food supplement	Alternative proteins	Algae	Fermented food	Animal by-products (ABP)	Novel food	Plant-based product
Cellular Agriculture Europe	1	0	0	0	0	0	0	0	0
Eurogroup for Animals	1	1	0	0	0	0	0	0	0
European Federation of Associations of Health Product Manufacturers	0	0	3	0	0	0	0	0	0
European Food Information Council	1	0	0	1	2	1	0	0	0
Federal Agency for the Safety of the Food Chain	0	0	0	0	0	0	1	0	0
Federal Office of Consumer Protection and Food Safety	0	0	1	0	0	0	0	0	0
German Federal Institute for Risk Assessment	0	1	0	0	0	0	0	0	0
International Platform of Insects for Food and Feed	0	5	0	0	0	0	0	0	0
International Probiotic Association - Europe	0	0	0	0	0	0	0	1	0
Ministry for Primary Industries	1	0	0	2	0	0	0	1	0
Spanish Agency for Food Safety and Nutrition	0	0	0	0	0	0	0	1	0
The Good Food Institute Europe	3	0	0	4	0	0	0	0	1
Vier Pfoten International	1	0	0	0	0	0	0	0	0
Singapore Food Agency	0	0	0	1	0	0	0	0	0
CGIAR System Organization	0	0	0	0	0	0	0	1	0
Food and Agriculture Organization of the United Nations	1	0	0	3	0	0	0	3	0
Health Canada	2	0	0	0	0	0	0	0	3
The Organisation for Economic Co-operation and Development	0	0	0	0	0	0	0	2	0
United States Department of Agriculture	0	0	0	0	0	0	0	2	3
Wageningen University & Research	1	2	0	1	0	0	0	0	1

G. Concise summary

Concerns have emerged about bans on cell-cultured products bypassing safety regulations, which may limit innovation and consumer choice, emphasizing the need for consistent regulation. Insect farming offers promise as a sustainable protein source, but scalability, ethical issues, and regulatory compliance pose challenges. Fragmented regulations on novel foods and supplements create uncertainty, prompting calls for harmonization to boost safety and industry growth. Alternative proteins like lab-grown meat and insects are promising but face production, safety, and ethical hurdles. Insects, increasingly used in animal feed, require further safety research, especially regarding allergens. Consumer acceptance of insect-enriched foods is growing, driven by health and environmental benefits. Clearer regulations are needed to avoid hindering innovation, and pre-market safety assessments are vital. Global collaboration is crucial for harmonizing safety standards and advancing food system sustainability through integrated strategies of regulation, education, and incentives. Ongoing research is essential to address risks tied to novel foods and emerging food technologies.

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