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DISCUSSION PAPER

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Getting to the meat of protein diversification in the EU

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Credit: CANVA

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ABOUT THE AUTHOR

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ACKNOWLEDGEMENT / DISCLAIMER

This Discussion Paper builds on the findings of independent research which was carried out in 2024-2025 with the support of The School for Moral Ambition. It explored how protein production and consumption can be diversified to improve the sustainability, competitiveness and resilience of Europe's agrifood systems in line with Green Deal objectives. In particular, the project focused on opportunities for protein diversification and how EU policies can help unlock this potential.

Executive summary

Europe's protein food systems are out of balance. High animal consumption and dependence on imported feed expose the EU to price shocks threatening food affordability. These trends, furthermore, heighten climate risks and drive biodiversity loss. Diversifying the protein mix – scaling plant-based, fermentation-derived and cultivated options while improving animal husbandry and reducing herd sizes – offers a credible route to lower emissions and land use, reduce external dependencies and strengthen competitiveness. Yet progress is slow, with policy fragmented and Common Agricultural Policy (CAP) delivery uneven, innovation pipelines stalled and public trust in protein technology low.

This paper sets out how to move from intent to impact. It argues for a mission-oriented approach that links protein production and consumption with innovation, finance and trust-building – and that commits to a clear timetable. The EU should:

- **Make protein diversification a cross-cutting Green Deal priority** at the core of the post-2027 CAP, linking climate neutrality, biodiversity recovery and food affordability, and setting clear expectations for member states and market actors;
- **Commit to time-bound delivery pathways with EU-level monitoring**, translating EU goals into measurable indicators, tracking progress annually and taking corrective action when delivery slips;
- **Ensure policy coherence across agriculture, health, trade and innovation** via inter-DG coordination on proteins in the European Commission so that CAP, bioeconomy/biotechnology, food policy and trade instruments pull in the same direction;
- **Crowd in public and private finance for scale-up**, de-risking first-of-a-kind facilities and value-chain infrastructure and lowering barriers for small to medium-sized enterprises (SMEs), co-operatives and farmer-led ventures;
- **Pair innovation leadership with public trust**: maintain science-based, predictable authorisation processes; strengthen transparent risk–benefit communication and clear labelling; and use public procurement to normalise diverse, healthy protein choices.

Taken together, these steps shift the EU from piecemeal initiatives to a governed transition that aligns incentives, markets and public confidence – and delivers sustainability, economic opportunity and resilience to the agrifood system.

1. The EU and dual-use innovation

1.1. AGRIFOOD CRISIS AND PROTEIN DIVERSIFICATION

Current patterns of protein production and consumption in Europe carry significant adverse environmental, social and economic impacts that must be urgently addressed. Without a decisive shift toward protein diversification, Europe risks locking itself into an unsustainable model that fuels emissions, erodes resilience and surrenders global leadership in food innovation.

While yields of Europe's major crops more than doubled during the 20th century,[1] this productivity came at the cost of industry intensification and expansion, which now place severe pressure on the environment and climate.[2] Today, EU agriculture accounts for 39.1% of the total land area and contributes 11% of total EU greenhouse gas (GHG) emissions.[3] The hidden cost of unsustainable farming systems is estimated at 10% of global GDP – an unjustifiable burden by any measure.[4]

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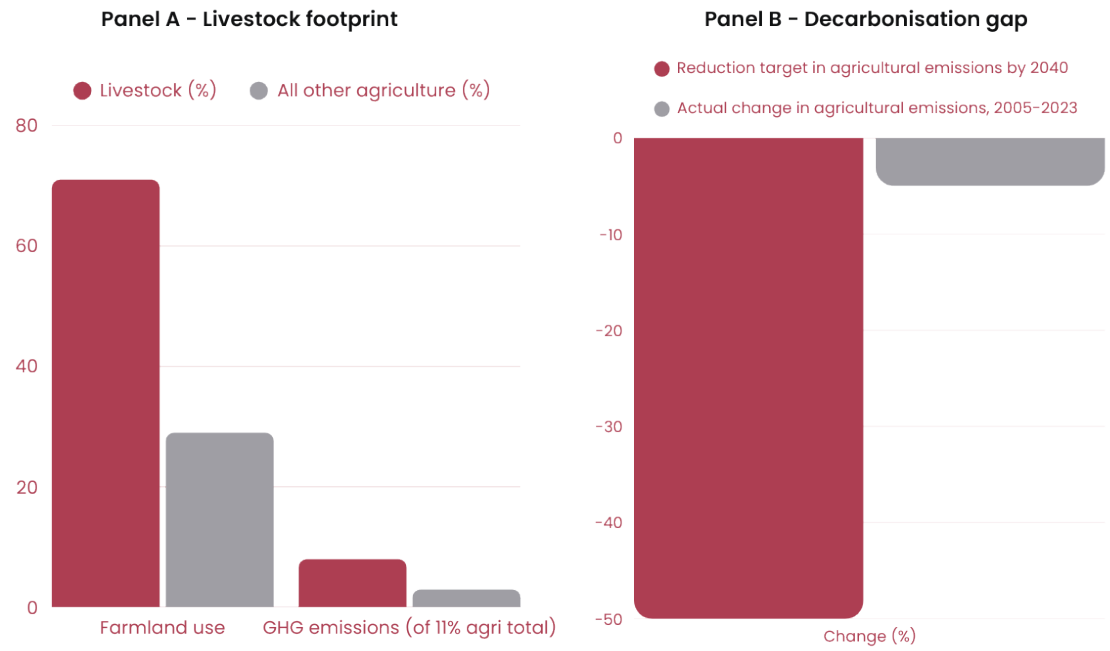
Livestock majorly drives these impacts since it uses 71% of all agricultural land and contributes 8% to the EU's GHG emissions – more than the emissions from international shipping and aviation combined (see Figure 1, Panel A).[5] While achieving net zero by 2050 will require halving agricultural emissions by 2040,[6] sectoral emissions have fallen by only 5% since 2005 (see Figure 1, Panel B).[7] Animal farming is also the leading cause of terrestrial biodiversity loss, soil acidification and air pollution, and water pollution from European agriculture, driving multiple ecological crises.[8]

A shift towards diversified proteins can contribute to one-fifth of the emission cuts needed to keep global warming below 2°C compared to pre-industrial levels.

While EU citizens consume twice as many animal products as the global average,[9] more than 1 in 12 EU citizens cannot afford a protein-rich meal every other day.[10] Currently, the EU produces most of the feed-protein it uses, but less than one-third of the high-protein feed ingredients required for livestock are sourced from within

Figure 1

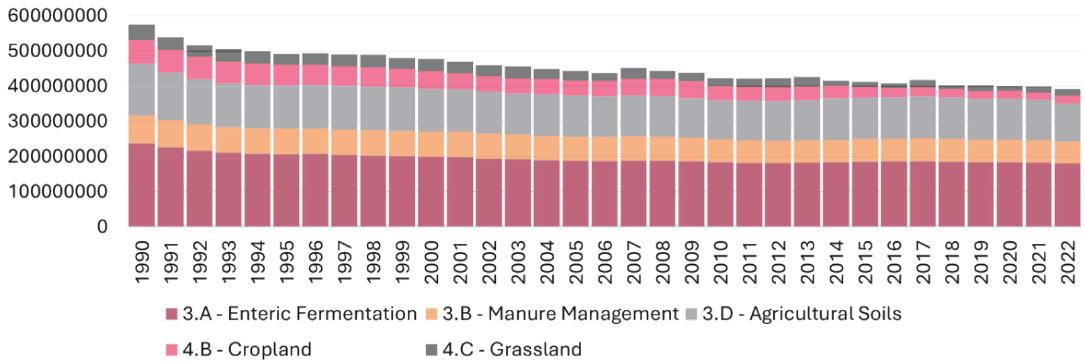
LIVESTOCK FOOTPRINT VERSUS CLIMATE TARGETS



Source: Author's elaboration, based on data from Greenpeace, 2020; European Commission, 2024; EEA, 2024.

Figure 2

EMISSIONS ASSOCIATED WITH AGRICULTURAL ACTIVITY (TCO2)



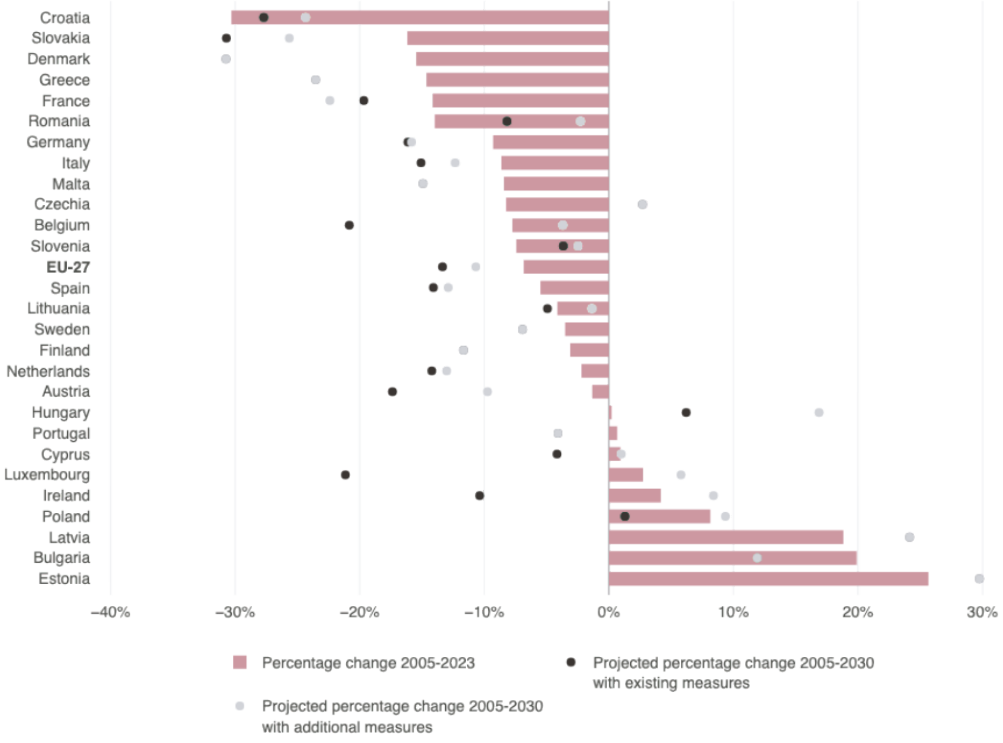
Source: European Environmental Agency data, visualised by the author.

the EU.[11] The resulting import dependency exposes the European agrifood system to price volatility, global market fluctuations and trade disruptions,[12] while contributing to deforestation, land-use change and biodiversity loss in third countries.[13]

A shift towards diversified proteins can contribute to one-fifth of the emission cuts needed to keep global warming below 2°C compared to pre-industrial levels, enhance public health resilience and reduce the agrifood system's exposure to geoeconomic shocks.[14] Protein diversification includes and extends beyond traditional protein sources.[15] While cereals are the biggest source of protein for human consumption worldwide, their protein-per-kilo ratio is considerably lower than that of other plant and animal sources.[16]

Figure 3

AGRICULTURAL EMISSIONS AND PROJECTED EMISSIONS BY EU MEMBER STATE



Source: Greenhouse gas inventory and GHG projections, European Environment Agency (EEA), 6 November 2025.

With demand for animal-based foods rising worldwide, this reliance on crops for feed is widening the food gap relative to increased demand for plant-based foods.[17] In response, novel proteins – such as plant-based products, fermentation-derived proteins and cell-based or cultured meats and fats – offer a higher resource-efficiency ratio.[18] Diversifying the EU's protein production and supply system to include both traditional plant-based and novel protein sources is therefore crucial to ensure sustainable, competitive and resilient agrifood systems.

1.2. STRATEGIC CONTEXT

The European Green Deal legally binds the EU to climate neutrality by 2050, with at least 55% net emission cuts by 2030 across all sectors. Yet, the Commission's 2040 climate target proposal does not provide a clear trajectory for emission reductions in the agriculture sector.[19] In the absence of a sectoral pathway that mobilises protein diversification, the sector remains off-track: current national projections show farm emissions rising towards 2030 despite substantial CAP spending.[20]

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Recent shocks have exposed structural vulnerabilities in Europe's protein model. The COVID-19 pandemic and 2022 Russian invasion of Ukraine triggered price spikes and supply volatility for key agri-commodities used in feed and food. The trade war with US following President Donald J. Trump's re-election, coupled with a potential US invasion of Greenland, has caused additional concern since the US is a major source of the EU's protein crop imports (e.g. soybeans and soymeal).[21]

These pressures have sharpened political divides over the direction of EU protein policy.[22] This split sits within a broader backlash against green measures in agriculture, channelled through rural discontent, so-called 'farmers' protests' and polarised politics.[23] Far-right parties are exploiting this discontent to undermine climate and environmental progress.[24] To counter these trends, the Commission launched a Strategic Dialogue on the Future of EU Agriculture in January 2024 bringing together diverse stakeholders to tackle key sectoral challenges and outline a sustainable vision for the agriculture sector.

On these premises, the Commission released a Vision for Agriculture and Food in February 2025.[25] The vision calls for a transition to a self-sufficient and sustainable EU protein system, de-risking the sustainable transition with public investment and streamlining of regulatory processes to enable food innovation to scale and enhance sectoral competitiveness.

Protein diversification is both a sustainability strategy and a competitiveness imperative: Europe cannot afford to miss this opportunity.

Nonetheless, the question remains if the EU and member states will find the political will to advance protein diversification. While the EU has strong research and entrepreneurial capacity in protein innovation, competitors in, for instance, the US, Singapore and Israel are advancing rapidly.[26] Plant-based and novel proteins offer outsized sustainability gains requiring far less land and water and generating markedly lower emissions than animal proteins. Global sales of plant-based food products grew by 34% between 2019 and 2023, with projections of capturing up to 22% of the protein market by 2035.[27] Protein diversification is therefore both a sustainability strategy and a competitiveness imperative: Europe cannot afford to miss this opportunity.

1.3 OBJECTIVE AND METHODOLOGY

The Discussion Paper explores prospects for and challenges facing protein value chain diversification in the EU. It discusses how EU policies and investments can unlock the potential of protein diversification to accelerate the transition to a more sustainable, competitive and resilient agrifood system, and provides actionable policy recommendations for the way forward.

This Discussion Paper draws on the author's independent research conducted between 2024 and 2025, encompassing literature reviews, expert interviews and insights from a February 2025 EPC roundtable with EU policymakers, industry and civil society stakeholders. The terms 'food protein', 'dietary proteins' and 'proteins for human consumption' are used interchangeably. The same applies to the terms 'feed proteins' and 'proteins for animal consumption'.

2. Emerging technologies and sustainable practices for protein diversification in Europe

2.1. OPPORTUNITIES

Plant proteins and plant-based alternatives

Plant proteins and plant-based alternatives encompass plant-based meat and dairy alternatives as well as pulses and other protein-rich crops. These proteins generate up to 92% lower GHG emissions, require 95% less land and consume 78% less water compared to beef (see Figure 4.[28] Further, using crops directly for human consumption can feed at least four times more people per unit of land compared to meat and dairy.[29]

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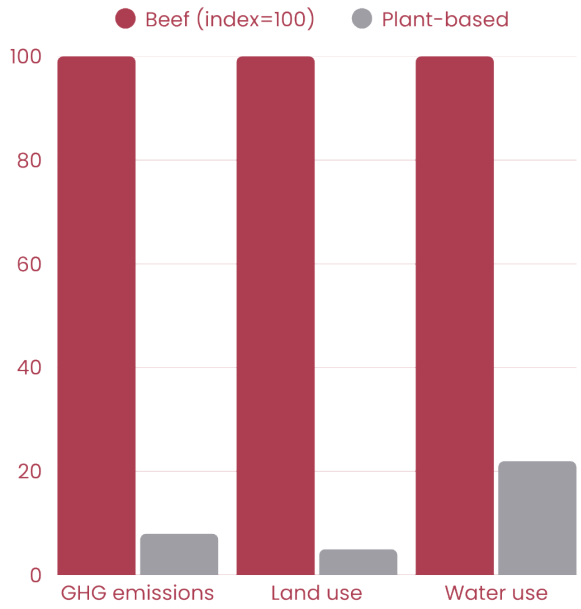
Nutrient-rich plant-based alternatives that meet World Health Organisation (WHO) dietary guidelines now mimic products like milk, burgers and cheese – with technology continuously enhancing affordability, taste and convenience to near parity with animal-based products. Global sales of plant-based products rose 34% from 2019–2023, with over half of overall investments occurring between 2021–2023.[30] Plant-based and novel proteins could capture 16% to 22% of the food protein market by 2035, with plant-based options leading the way.[31]

In the EU, expanding high-protein crop cultivation for plant-based product manufacturing would enhance farming's profitability[32] and make farming more attractive to younger generations.[33] Moreover, it could lower input costs by incorporating nitrogen-fixing legumes and create new revenue streams through waste valorisation and diversified crop production. Because high-protein plant crops are much more resource efficient than their animal counterparts, farming these proteins in accordance with agroecology and regenerative principles would enable the restoration of ecosystem balance while safeguarding food security.

Figure 4

RESOURCE-EFFICIENCY ADVANTAGE OF PLANT VS BEEF



Source: Author

CASE STUDIES – PLANT-BASED, NOVEL PRODUCTS

- **Oatly**, a Swedish pioneer in plant-based dairy alternatives, has revolutionised Europe's protein landscape by transforming oats into a sustainable, mainstream choice. Its innovative enzyme technology and effective marketing have sent oat milk into cafes and homes across over 60 countries, with revenues exceeding $800 million in 2024.
- **Quorn**, headquartered in the UK, drives sustainable protein diversification through fermentation. Its meat alternative requires far less land and water than traditional animal farming. Quorn's range of products, including meat-free mince, nuggets and fillets, has gained popularity across Europe, demonstrating the viability and consumer acceptance of fermentation-based proteins in the mainstream market.

Novel proteins, blends and hybrids

The case for fermentation-based and cultivated proteins mirrors that of plant-based proteins, offering significant resource efficiency gains – including up to 90% lower land use, 92% fewer GHG emissions and 66% less water use compared to conventional beef production.[34] These proteins are produced through bioprocessing in controlled environments, such as bioreactors, where microorganisms or nutrient-rich media convert biomass into functional ingredients. While fermentation-based proteins are already present on the EU market, cultivated proteins have yet to be scaled up, despite having been approved for commercial authorisation in the United States, Singapore and Israel.

Taken together, these novel protein sources offer a powerful lever to reduce Europe's reliance on conventional animal farming and mitigate risks associated with industrial animal farming at times of increasing feed prices, climate volatility and disease.

Novel protein sources could free up millions of hectares of land in the EU[35] which can be repurposed to advance organic farming and nature restoration, avoiding billions in investments[36] to engineer carbon removals.[37] However, in order to avoid swapping one intensive and unsustainable type of agriculture with another, protein diversification must go hand in hand with the widespread adoption of agroecological and regenerative farming practices and vice versa.[38]

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Reframing animal farming: smaller herds and circular feed

Despite its mounting climate and environmental impacts, animal farming is a source of income for many, and its products can provide key nutrients in specific local contexts. Shifting from intensive farming – marked by high emissions and disease risks[39] – to more sustainable animal husbandry with smaller herds could help reduce emissions. This requires aligning livestock numbers with locally available resources and moving away from using food crops for animal feed towards using natural grasslands, waste streams and low-grade legumes instead.[40]

CASE STUDIES – 'FUTURE FOODS'

- **Mosa Meat**, based in the Netherlands, produces cultivated beef directly from animal cells which reduces the land, water and emissions footprint compared to traditional livestock farming while delivering a familiar product to consumers. Its products are not yet commercial, as regulatory approval for cultivated meat in the EU is still pending.
- **Solar Foods**, based in Finland, produces Solein – a protein powder made by fermenting microbes with renewable electricity and captured CO_2 – decoupling protein production from agriculture and slashing resource use.
- **Farmless**, a Dutch startup, uses fermentation to create protein-rich ingredients from non-agricultural feedstocks, further reducing land and water demands.

CASE STUDIES – FARMERS IN TRANSITION

- **Benedikt Sprenker**'s farm in Nordrhein-Westfalen, Germany integrates legumes – such as fava beans, soybeans and pulses – into crop rotations alongside pig farming. This approach enhances soil health, reduces reliance on imported feed and promotes circularity.
- **Matthias Krön**'s journey from dairy manager to pioneer of plant-based proteins in Austria exemplifies systemic change in action. By founding Joya and leading Donau Soja, he has helped double European soy production and expand value chains for chickpeas and fava beans, with byproducts creating circular synergies.

Shifting from intensive farming to more sustainable animal husbandry requires aligning livestock numbers with locally available resources and moving away from using food crops for animal feed

This would significantly reduce the land needed for feed production, allowing more land to be used for agroecological food, nature restoration and renewable energy expansion.[41] Moreover, this shift would enhance economic security and social resilience in the EU by reducing import dependencies, shortening supply chains and diversifying income streams for farmers.

2.2. CHALLENGES

Challenges with plant-based and novel proteins

Agricultural subsidies are skewed in favour of animal farming: 82% of EU CAP payments support production of animals (38%) and the cultivation of plants such as corn, wheat, grass and oilseeds to feed those animals (44%) (see Figure 5).[42] A study examining subsidies, lobbying efforts and new regulations from 2014 to 2020 reveals that livestock farmers across the EU received 1,200 times more public funding than producers of plant-based and novel proteins.[43]

Scaling production remains a significant challenge for novel protein companies, particularly in the cultivated meat sector. Developing these technologies requires substantial capital investment – including debt financing and infrastructure loans – to support the construction of manufacturing plants and supply chains essential for scaling production.[44]

European value chains for protein-rich plant-based foods are underdeveloped and fragmented. The absence of legume-based meat and dairy alternatives (LBA) manufacturers is the most widespread barrier to increasing regional value chains, highlighting the need for the EU to finance infrastructure and policies that incentivise value chain development and new connections between legume producers, processors, manufacturers and consumers.[45]

Regulatory hurdles and uncertain policy support risk preventing emerging protein innovation from reaching scale in the EU and keeping pace with advancements in other global markets. Novel foods[46] require rigorous, costly and time-consuming approval processes that can be prohibitive, especially for small companies. While this regulatory complexity is designed to uphold the high food safety standards the EU is known for, it also risks undermining the transformative potential of novel food products by sending discouraging signals to startups and researchers.[47] For example, Italy passed a law banning the sale and marketing of cultivated meat and prohibiting the use of meat-related names for plant-based products.[48] In October 2025 members of the European Parliament voted to ban the use of terms like "burger", "steak" or "sausage" in reference to plant-based foods.[49]

Regulatory hurdles and uncertain policy support risk preventing emerging protein innovation from reaching scale in the EU and keeping pace with advancements in other global markets.

Health concerns cast a shadow over public acceptance of plant-based and novel proteins. Plant-based and novel proteins offer health benefits that could prevent millions of unnecessary deaths annually.[50] Nonetheless, consumer willingness to shift remains conditional: while a third of Europeans consider replacing meat with plant-based alternatives, this share drops if they contain Genetically Modified Organisms (GMOs).[51] Similarly, few consumers express willingness to replace meat with high-tech alternatives such as cultivated proteins.

Barriers to sustainable diversification

A foundational barrier lies in the economic and operational feasibility of diversification for farmers who would be willing to transition. Many struggle to access clear business models and appropriate financial support.[52] Private sector financing remains inadequate and lacks tailored financial products that reward sustainability gains. In 2022, the unmet demand for financing among EU farmers reached €62 billion, disproportionately affecting small farms and young farmers.[53] Beyond capital, farmers also report limited access to knowledge, education and a technically skilled workforce to support the shift to novel practices and crops.[54]

The ongoing consolidation and intensification of both animal and crop farming also act as counterforces to sustainable diversification.[55] Over the last 70 years, agriculture has evolved from primarily a local activity to a global industry feeding a growing population with globalised tastes.[56] As nodes of the increasingly globalised farming system scale up, farms converge on a narrow set of technologies and practices. The resulting erosion of systemic resilience is pushing the agrifood chain towards a tipping point – threatening food security in the long run.[57]

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On the other hand, the implementation of alternative animal husbandry systems – such as organic, grass-fed and free-range – often results in increased climate, land use and water footprints per kilo of protein compared to conventional practices.[58] A new emphasis should therefore be placed not only on which practices are used, but also on how they are implemented — and on ensuring that changing practices does not replace the imperative of reducing herd sizes overall.[59]

3. EU policy framework

The EU's approach to protein diversification spans multiple policy frameworks addressing public financing, production and consumption.

The Vision for Agriculture and Food demonstrates the EU's recognition of protein diversification as a strategic priority, calling for "a transition to a self-sufficient and sustainable EU protein system" for "de-risking the sustainable transition with public investment" and the "streamlining of regulatory processes to enable food innovation to scale and enhance the competitiveness of the sector".[60]

Recently, the Commission announced its intention to develop a comprehensive strategy for protein diversification specifically. The move follows growing political and stakeholder demand, including a call from over 130 civil society and industry actors for an EU Action Plan for Plant-Based Foods,[61] a joint position paper on protein diversification signed by 90 organisations across the protein spectrum[62] and multiple requests from Members of the European Parliament (MEPs).[63] While the 2026 Commission Work Programme does not list an EU-level protein strategy, it schedules a non-legislative Livestock Strategy in Q2 2026. This creates potential framing space for supply-side measures relevant to diversification and signals emerging political willingness to put the issue on the EU agenda.[64] But how fit are existing sectoral EU policy frameworks to enable such a shift?

3.1. FOOD PRODUCTION AND LAND MANAGEMENT POLICIES

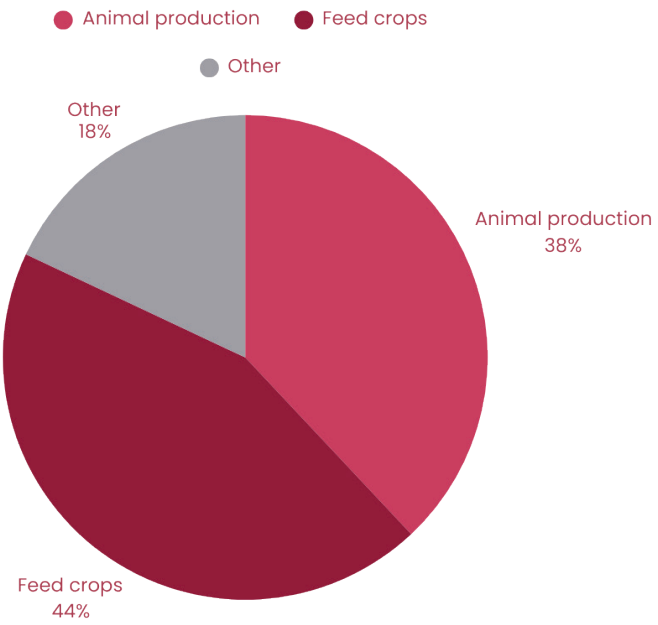
Common Agricultural Policy (CAP)

In terms of production policies, CAP remains the central funding mechanism for EU agriculture. The 2023–2027 CAP cycle has struggled to translate ambition into delivery. Although its reform aimed to give member states greater autonomy through National Strategic Plans, this decentralised model has effectively fragmented the policy, weakening its collective leverage.[65] While eco-schemes were introduced as a tool to reward sustainable practices, most member states have not used this flexibility to significantly shift support away from traditional, high-impact farming systems.[66] As a result, CAP continues to prioritise conventional agricultural models, offering limited alignment with the EU's broader sustainability and climate goals.

Although its reform aimed to give member states greater autonomy through National Strategic Plans, this decentralised model has effectively fragmented the policy, weakening its collective leverage.

Figure 5

COMMON AGRICULTURAL POLICY FUNDING SUPPORT DISTRIBUTION



Source: Nemcová, T. et al (2022) data, visualised by the author.

The CAP 2023–2027 continues to lack explicit incentives and targets for reducing herd sizes and livestock densities: 70% of funds are primarily available for livestock sectors, mostly for intensive rearing which perpetuates high-emission farming.[67] Adding to this, many countries continue to permit the drainage of peatlands for ruminant livestock production and the conversion of arable land to permanent grassland, which undermine climate mitigation efforts.

If designed to provide result-based, stable and targeted financial support, the post-2027 CAP reform can reward farmers for adopting protein crops and sustainable animal husbandry practices.

The post-2027 CAP reform presents an opportunity. In July 2025, the Commission proposed a new transition payment of up to €200,000 per beneficiary to support on-farm shifts.[68] It also proposed updating marketing standards and the Common Market Organisation to create a dedicated protein crops sector and to introduce origin labelling for protein crops and products.[69] If designed to provide result-based, stable and targeted financial support, the reform can reward farmers for adopting protein crops and sustainable animal husbandry practices, such as herd size reduction and circular feed systems; it can also help overcome structural barriers, provided it explicitly rebalances support towards plant-based protein production. Member states will also play a pivotal role, with their commitment and capacity to embed diversification in national CAP Strategic Plans determining the effectiveness of implementation.

Fisheries and the bioeconomy

The Common Fisheries Policy (CFP) and EU Blue Economy Strategy are the policy backbone of the fishing sector. These frameworks contribute to protein diversification primarily through sustainable fisheries management and emerging support for alternative marine proteins such as algae and organic aquaculture.[70]

However, policy incentives for innovation in alternative marine proteins are underdeveloped, slowing the emergence and scaling of innovation. While links to broader food and bioeconomy strategies formally improved with the 2025 European Ocean Pact,[71] the CFP remains only loosely connected to these strategies, limiting the potential for integrated approaches that span land and sea-based protein sources. Regulatory fragmentation across EU and national levels further complicates efforts to build cross-sectoral value chains, often resulting in missed opportunities for synergies among fisheries, aquaculture, agriculture and food innovation.

In November 2025, the Commission adopted the new Bioeconomy Strategy, which explicitly supports advanced fermentation and biomanufacturing to scale sustainable protein ingredients.[72] By promoting innovation across biological sectors, it can accelerate the development and scale-up of novel protein sources. If protein diversification is made a core priority within the strategy, and funding and regulation are aligned accordingly, the Bioeconomy Strategy could help address infrastructure gaps and catalyse market readiness for emerging proteins.

Carbon market, land-use legislation and trade instruments

As for the climate impacts of food production, the Effort Sharing Regulation (ESR) sets binding national GHG emission reduction targets for sectors not included in the EU Emissions Trading Scheme (ETS), including agriculture.[73] Alarmingly, it maintains that the sector has a lower mitigation potential compared to others. Moreover, it allows member states flexibility to meet part of their ESR targets through land use credits, effectively permitting agricultural emissions to be offset rather than directly reduced on farms.

Similarly, the Land Use, Land Use Change and Forestry (LULUCF) and the Carbon Removal Certification Framework (CRCF) regulations set standards and targets on carbon accounting and emission removals rather than for reducing emissions at the source. Under the European Deforestation Regulation (EUDR), seven key commodities and their derivates linked to deforestation – including cattle and soy – will be allowed to enter the Single Market only if deforestation-free. These will, however, enter the market free of charge for their broader carbon footprint, since agriculture is not included in the Carbon Border Adjustment Mechanism (CBAM).

Regulations set standards and targets on carbon accounting and emission removals rather than for reducing emissions at the source.

In parallel, EU co-legislators have provisionally agreed an agricultural safeguard regulation tied to the EU–Mercosur agreement, with signature and conclusion pending.[74] The Council has now greenlit signature and steps towards provisional application, while conclusion will still require the European Parliament's consent and completion of the ratification process.[75] Without complementary policies targeting livestock reduction and protein diversification, the impact of climate and land use legislation on transforming the agri-food system will remain limited.

3.2. FOOD PROCESSING AND INNOVATION POLICIES

EU public financing and industrial policies offer mixed support for transitions to more sustainable and diversified protein systems. Horizon Europe, the EU's flagship research and innovation programme, has funded several projects on alternative proteins, agroecological transitions and climate-friendly food systems. Yet, Horizon Europe suffers from chronic underfunding relative to its ambitions, with only three of ten proposals evaluated as excellent ultimately receiving grants due to budgetary constraints.[76] What is more, despite its €93.5 billion budget (2021–2027), only a small fraction of Horizon Europe's funds is allocated specifically to sustainable protein research.[77]

Limited support for manufacturing scale-up, processing, and market integration. This creates a 'valley of death' where promising innovations fail to reach commercial scale.

The European Innovation Council (EIC), under its Accelerator Challenge, has issued targeted calls in support of sustainable proteins, namely, €50 million for scaling up precision fermentation and algae-based foods.[78] These instruments help bridge the gap between research and development (R&D) and market entry, but their reach is still limited relative to the scale of infrastructure investment needed for sector-wide transformation. In fact, most programmes prioritise early-stage R&D, with limited support for manufacturing scale-up, processing, and market integration. This creates a 'valley of death' where promising innovations fail to reach commercial scale.[79]

The Bioeconomy Strategy offers a vehicle to prioritise protein-related infrastructure and value-chain capacity, while the proposed EU Biotechnology Act (phase 1 due in Q1 2026 and phase 2 due in Q3 2026) focuses on regulatory simplification and timelier European Food Safety Authority (EFSA) risk assessment. However, it does not streamline approval pathways for novel foods and explicitly excludes novel foods from regulatory sandboxes.[80] Streamlined EFSA processes for novel foods and ingredients would increase investment in and global competitiveness of European protein producers.

Some national programmes have been established to complement areas not adequately covered by EU-level funding, with the scale and consistency of these efforts varying significantly across countries.[81] For instance,

the Netherlands, France and Denmark have established their own research and innovation (R&I) funds to accelerate protein diversification, supporting both early-stage innovation and infrastructure development.

3.3. MARKETING AND CONSUMER POLICIES

At the EU-level, the Farm to Fork Strategy advocates for harmonised nutrition labelling (e.g. Nutri-Score) to highlight the health benefits of particular products, including those containing plant-based proteins. While adopted by several EU countries, the Nutri-Score is not mandatory EU-wide. The Commission has considered a harmonised front-of-pack nutrition labelling system, but documents leaked in March 2025 suggest that it has abandoned these plans.[82] Similarly, the Commission's Vision for Agriculture and Food does not include such measures to help consumers quickly assess the nutritional quality of foods.

Over one-third of EU countries charge significantly higher taxes on plant-based than animal products.

As for fiscal policy, the European average VAT rate is lower for meat and milk than for fruit and vegetables. The 2022 reform of the VAT Directive granted member states more freedom to apply reduced VAT rates to a range of eco-friendly goods and services. However, the provision on foodstuffs is rather general, allowing for mass-produced animal products to easily qualify for reduced rates. As a result, over one-third of EU countries charge significantly higher taxes on plant-based than animal products.[83] These measures are counterintuitive, as growing evidence suggests that increasing VAT rates on meat and dairy and lowering rates on fruits and vegetables would result in positive health, environmental and economic outcomes in most European countries.[84] In December 2025, the Commission presented the EU Safe Hearts Plan on cardiovascular health, inviting member states to consider evidence-based fiscal measures and improved labelling to promote healthier diets.[85]

Most sustainability criteria in public procurement remain voluntary, leading to wide disparities in uptake and ambition across member states.[86] Moreover, current procurement assessments often neglect the full environmental footprint of food products, underestimating the benefits of plant-based and novel protein options. The ongoing review of the EU Public Procurement Directive (due in 2026) offers a key opportunity. By mandating lifecycle-based sustainability criteria in public food tenders, the directive could drive demand for plant-based and novel proteins, support regional value chains and improve market access for SMEs. This alignment would help shift public consumption towards healthier, low-impact proteins and foster systemic food transformation.

At the member state level, France tried to ban the use of meat-related terms to describe or market plant-based products that serve as meat substitutes.[87] Italy and Hungary have gone even further by attempting to ban the production, consumption and marketing of cultivated proteins.[88] Such national measures risk fragmenting the Single Market and weakening investor confidence.

From a regulatory perspective, the most important instrument affecting sustainable protein diversification is the Novel Food Regulation. As discussed earlier, this framework remains cumbersome and fragmented, delaying market entry. While the Commission's emphasis on regulatory clarity is welcome, it needs to go further to establish a coherent and genuinely enabling policy environment for sustainable protein markets.

A streamlined and predictable authorisation process at EFSA, together with clearer rules on naming and scope of use, would reduce compliance uncertainty for innovators without compromising high safety standards. Recent developments point to a gradual, albeit uneven, regulatory modernisation process. In December 2025, the co-legislators reached a provisional agreement on plants produced by certain new genomic techniques (NGTs), introducing a more risk-proportionate treatment for specified categories of plants.[89] Although the agreement does not extend to microbial fermentation (which continues to fall under separate GMO and Novel Food regimes), it signals a broader willingness to modernise regulation relevant to protein crops.

A streamlined and predictable authorisation process at EFSA, together with clearer rules on naming and scope of use, would reduce compliance uncertainty for innovators.

By contrast, the proposed EU Biotechnology Act widens EFSA pre-submission advice for food innovators but excludes novel foods from regulatory sandboxes – a missed opportunity to pilot proportionate approval pathways and reduce fragmentation.

4. Conclusions and recommendations

Europe's agrifood system faces mounting pressures from climate change, environmental degradation and import dependencies, while contributing substantially to GHG emissions, pollution and biodiversity loss. As discussed in this paper, the EU's overreliance on animal-based proteins not only undermines food affordability and security but also exposes consumers to global market volatility and health risks. Addressing this challenge requires a fundamental rethink of how proteins are produced and consumed, and a bold, coordinated response at the EU and member state level.

Protein diversification offers a strategic opportunity to address these systemic challenges. Yet, the transition remains constrained by fragmented policies, limited public financing, regulatory bottlenecks and underdeveloped markets. Now is the time to embed protein diversification at the heart of Europe's agrifood transition, with the EU and member states acting in tandem to turn this vision into reality.

Strategic direction for the sustainable protein transition:

- **Make protein diversification a work programme priority.** The Commission should anchor protein diversification as a cross-cutting Green Deal priority in its work programme, positioning it as a lever for climate neutrality, biodiversity recovery and food affordability. This requires a coherent narrative that links production, consumption and innovation and sets expectations for member states and market actors.

- **Set measurable EU-wide diversification trajectories.** The Commission and member states should commit to time-bound diversification trajectories that translate into measurable outcomes (e.g. shifts in protein mix, import exposure and land-use pressures) and which are monitored under a common EU framework, with regular stock-takes and corrective action when progress lags.

- **Ensure policy coherence across agriculture, health, trade and innovation agendas.** The Commission should mandate coordination between Directorate-Generals on protein diversification and by aligning CAP, bioeconomy and biotechnology agendas.

- **Mobilise public and private finance at scale.** Similarly, the EU should crowd in private and public finance for the protein transition by signalling long-term policy stability, coordinating EU instruments for scale-up and lowering barriers for SMEs and farmer-led ventures to build EU value chains in plant-based, fermentation-derived and other sustainable proteins.

- **Pair innovation with trust.** EU institutions should couple innovation leadership with public trust by accelerating safe pathways for novel proteins while investing in transparent communication, clear labelling and public procurement that legitimises diverse, healthy protein choices.

Policy coherence & regulatory reform:

- **Develop commodity-specific strategies and action plans with targets.** The EU and member states should elaborate commodity-specific strategies and action plans for key protein sources. These strategies should directly address Europe's protein crop deficit, reduce reliance on imports and support a shift in the agrifood sector toward decarbonisation and biodiversity restoration. Member states should translate these targets into region-specific transition plans that guide CAP spending and land-use choices, tailored to local agroecological zones and sustainable protein opportunities.

- **Integrate protein diversification across policies.** Protein diversification must become a core objective across the EU's agricultural, food, health, trade and environmental policies. For agriculture, diversification should be embedded in the post-2027 CAP reform, the 2025 Bioeconomy Strategy's implementation and the proposed biotechnology policies. In food policy, dietary guidelines and public procurement should be aligned with sustainable protein targets. In health, chronic disease risks linked to current diets should be addressed. In trade policy, the Carbon Border Adjustment Mechanism (CBAM) and the Deforestation Regulation (EUDR) and major trade agreements – including the EU-Mercosur Agreement – should include measures to shield sustainable European protein producers from unfair competition by unsustainable imports – particularly in relation to soy. In environmental policy, biodiversity loss, pollution, and emission reduction from agriculture should be prioritised. The Commission should task a cross-DG coordination mechanism with aligning agriculture, food, health, trade and innovation instruments and prevent fragmentation.

- **Streamline novel food approval while upholding safety.** To make Europe a food innovation hub, the EU should pursue a reform of the EU's Novel Food Regulation to introduce clear timelines, proportionate and transparent procedures for low-risk products, and greater guidance for SMEs beyond what is currently proposed for the 2026 Biotechnology Act. While the European Food Safety Authority (EFSA)'s assessments must remain robust, the process should not stifle innovation due to uncertainty and inefficiencies. This includes establishing regulatory sandboxes allowing companies to test their novel food ideas while ensuring consumer protection and mutual recognition for novel protein products authorised in scientifically credible jurisdictions.

- **Strengthen EFSA's capacity to respond to Novel Food applications.** The Commission and the Budgetary Authority should increase the EFSA's technical expertise and budget to manage an expected increase in novel protein dossiers. This should complement the

EFSA-focused measures foreseen under the proposed Biotechnology Act and include investing in risk assessment infrastructure and staff specialisation on new technologies such as fermentation-derived and cultivated proteins. It also includes dedicated public communication and guidance to build trust during authorisation and market entry.

- **Develop a coherent EU strategy for agricultural side-streams.** As part of the new EU Bioeconomy Strategy, the Commission should develop a framework for allocating agricultural biomass and side-streams across competing uses – such as biomass fermentation, bioenergy and bio-based materials. The implementation of the strategy should prioritise value-added applications in sustainable protein production while ensuring circularity, food system resilience and alignment with biodiversity and climate goals.

- **Reform EU animal welfare legislation.** The Commission should update the EU's animal welfare framework to reflect scientific evidence, reduce suffering, limit herd sizes to locally available resources and prevent practices linked to zoonotic risks and antimicrobial resistance.

Public finance and private investments:

- **Reform CAP payments through results-based incentives and a shift towards plant proteins.** The Commission should propose changes to the CAP to move from area-based to results-based payments, explicitly rewarding farmers for measurable outcomes in environmental performance – including reducing livestock herd size and density – and adoption of sustainable farming practices. This should build on the July 2025 CAP package, including the proposed transition payment and marketing-standards updates creating a protein-crops sector and origin labelling, and be embedded within the National and Regional Partnership Plans under the next MFF. This shift must provide a substantial increase in targeted support for protein crop production, particularly pulses and legumes, including via coupled support and eco-schemes. This transition requires member states to embed protein diversification targets in CAP Strategic Plans and earmark dedicated support for protein transition, especially for small and young farmers. This should be supported by robust EU-level coordination and annual scorecards to ensure that all member states deliver meaningful shifts away from high-impact farming systems.

- **Scale up R&D investment for protein innovation.** The EU and member states should substantially increase funding under Horizon Europe and national funding respectively for research and development in sustainable protein sources to spur diversification, including provisions for plant-based, fermentation-derived and cultivated proteins. The EU should prioritise cross-disciplinary innovation that bridges agronomy, food science and supply chain management, ensuring that breakthroughs can move efficiently from lab to market. The Commission should facilitate the creation of a cross-sectoral protein innovation cluster that unites public institutions, researchers, industry actors, farmers and civil society to accelerate uptake.

- **Expand and align EU financial instruments.** The Commission and the EIB Group should strengthen and coordinate the use of blended finance vehicles – such as InvestEU, the EIC Accelerator and relevant guarantee and loan facilities – to de-risk private investment in emerging protein sectors. These instruments should strategically target the scaling of production capacity, infrastructure and market entry for plant-based and novel proteins. Access to these tools should be widened – especially for SMEs, cooperatives and farmer-led ventures – through simplified applications and support services.

- **Facilitate farmer transitions with dedicated funds and skills development.** The Commission's proposal to establish dedicated transition funds under the CAP should be accompanied by making advisory services under the CAP and Just Transition Fund fit to support farmers in diversifying protein production. Farmers need clear economic models, tailored training and peer-to-peer learning opportunities to build the skills needed for sustainable protein systems, ensuring that the transition is both economically viable, socially inclusive and environmentally sound.

- **Gear fiscal policies towards sustainable protein diversification.** The Commission should propose to the Council amendments to the VAT Directive to clearly reflect the impact of foodstuffs on the environment. Similarly, member states should reform VAT to remove economic distortions, such as the lower VAT placed on meat than on plant-based foods.

Market development & consumer access:

- **Accelerate commercialisation and value chain development.** To support the commercialisation of research outputs, the EU and member states should foster public-private partnerships, invest in supply chain infrastructure, and facilitate access to markets for sustainable protein products. Collaboration across the agrifood value chain must be encouraged to ensure efficient scaling and market uptake. This includes strengthening and connecting regional legume growers, processing actors and manufacturers of plant-based products to address current fragmentation.

- **Integrate protein diversification in public procurement.** The ongoing review of the EU Public Procurement Directive should be seized to this end. Ambitious and achievable targets should be set for the inclusion of sustainable and diverse protein options in schools (including via the CAP EU School Scheme for fruit, vegetables and milk), hospitals and public catering, creating stable demand and market signals. In addition, EU and member state-level authorities should include lifecycle-based sustainability criteria in public tenders.

- **Improve the food environment for sustainable and healthy choices.** The EU should lead on harmonised front-of-pack labelling grounded in standardised, proportionate risk–benefit assessments for all protein products, with clear provisions for novel proteins. This should be accompanied by mandatory origin labelling for protein crops and protein-based products, as proposed by the Commission, to enhance transparency and support EU protein value chains. Mandatory disclosure of health and environmental performance and stricter rules on misleading marketing will enable informed choices and steer innovation toward public goods. At member state level, this should be complemented with EU-supported public awareness campaigns and culinary initiatives that reflect local food cultures.
- **Make data more accessible and interoperable.** The EU should coordinate member state-level efforts to ensure interoperability with national databases and support transparent monitoring, traceability and evidence-based policymaking. Furthermore, it should develop common indicators for company-level disclosure (e.g. protein mix, reformulation, sourcing) to support transparent progress tracking across the chain. These efforts should aim to fill current data gaps, particularly around emerging protein technologies and consumer behaviour, and help assess socioeconomic, health and environmental impacts of protein sources.

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NOTES

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