

POLICY BRIEF

Scientific Literature on Alternative Proteins

EXECUTIVE SUMMARY

Food systems drive five of the six planetary boundaries humanity has transgressed, and animal proteins are the heaviest contributors: livestock occupies ~83% of the world's agricultural land while returning less than 1/5 of its calories^{3,4}. Introducing alternative proteins alongside animal proteins could cut emissions substantially and lower consumers' mortality risk, yet the sector meant to replace it is taxed more heavily and starved of scale-up capital^{4,5,9,10,11,12}.

This brief recommends that the European Union open its existing funding mechanisms to alternative protein manufacturing, remove the tax penalty these products face against animal-based equivalents, and support workers displaced throughout the process.



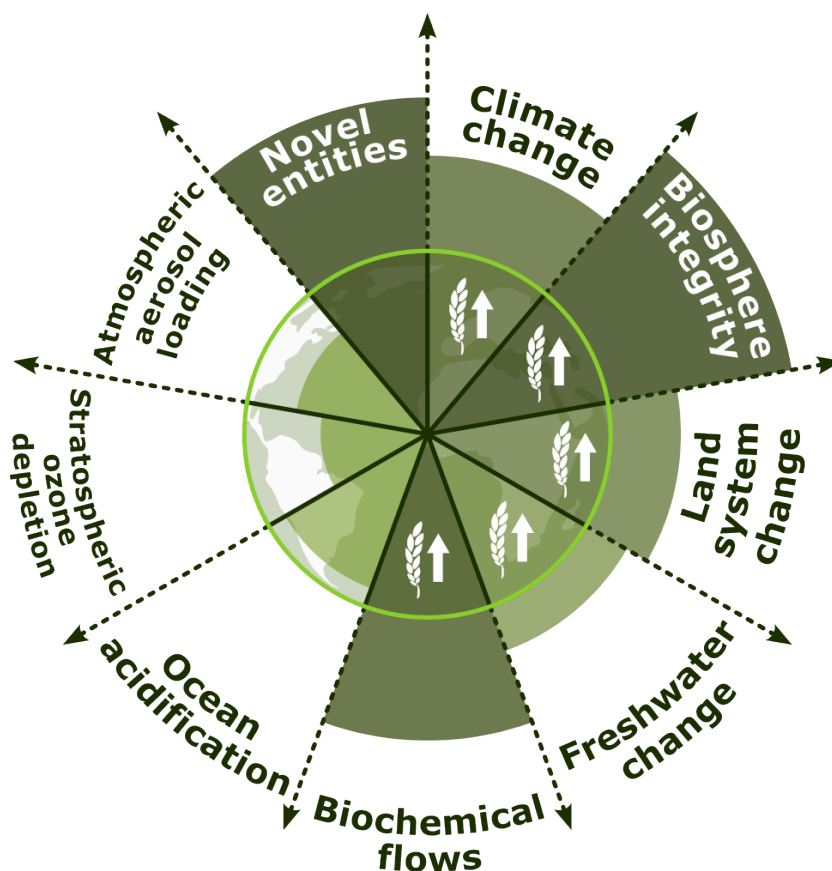
BACKGROUND & CONTEXT

In 2009, twenty-nine leading Earth system scientists proposed a framework of nine ‘planetary boundaries’ which, once transgressed, risk destabilising human civilisation as we know it¹. Of these nine boundaries, six have since been transgressed, with food systems now being the largest driver, responsible for five of the six transgressions². This outsized impact from food production forces us to face the reality of our diets, and how best we can reformulate the hardest-hitting foods — animal proteins — into sustainable consumption habits.

Although the global food system generates €8.7 trillion in value per year, its annual costs are estimated at €13.2 trillion once environmental and health impacts are included, with the health sector being the hardest hit². Much of this external cost originates in livestock production, occupying ~83% of the world’s agricultural

land while returning only 37% of global protein and 18% of calories⁴. Even a partial change — halving consumption of the highest-emitting animal products and substituting plant-based alternatives — may reduce global greenhouse gas emissions across all sectors by 20%^{4,5}, although, importantly, these figures depend on a partial reduction — not total elimination — of animal proteins. Repurposed from livestock, that land would cease emitting, and given time even recover its natural vegetation, sequestering 8.1 billion metric tonnes of CO₂ annually, ultimately turning a source of net environmental harm into a carbon sink^{4,5}. This broad effect holds true even at smaller scales, with a 2026 analysis of university canteen meals finding that animal-based meals exceeded planetary boundary thresholds under every scenario modelled, while plant-based menus were closer to compliance when food waste was controlled⁶.

Figure 1. Status of nine planetary boundaries as of 2023, with food-driven transgressions marked³





BACKGROUND & CONTEXT

Long-term panel studies show overall mortality to be lowest when red meat consumption is reduced and complemented by plant proteins, associated with reduced risk of type 2 diabetes, coronary heart disease, and colorectal cancer; in one 33-year study of over 200,000 adults, those most closely following a balanced dietary pattern between the two had 28% lower overall mortality than those who did not². The mortality risk with red meat in particular seems to be approximately linear: risk falls as consumption falls, without requiring total elimination, suggesting a moderate approach to consumption². That said, diets very low in animal-sourced foods lack bioavailability of certain important nutrients⁷, including vitamin B12 deficiency, potentially causing permanent neurological damage (especially for children and the elderly, with analyses confirming that plant-based alternatives are deficient in B12⁸), meaning a dietary transition must either be accompanied by appropriate supplementation or pursued in balance with animal-based proteins, rather than treating a total elimination as unconditionally beneficial².

The economics of the current (animal-based) protein system bear exploring as well, uncovering a far less stable landscape than would be expected from a sector responsible for feeding our nations. Across the EU,

Common Agricultural Policy support amounts to €4.24 billion annually, 40% of which flows into the beef sector alone, according to a Belgian analysis⁹. The plant-based alternative protein sector, on the other hand, competes on an unlevel playing field: this global market projected to grow from €20–30 billion today to between €70–280 billion by 2030 is stifled by VAT rates up to 22 percentage points higher on plant-based products than on animal-based equivalents, and is continually subject to retail practices that segregate plant-based products from meat departments, suppressing sales that would otherwise be up by 67% by permitting co-location^{10, 11, 12}.

The sector also lacks public scale-up investment, leaving producers struggling to make the shift towards food-grade production that would bring prices closer to animal-based goods^{9, 10}. The labour implications of a protein transition are more challenging to reconcile, being slightly net positive in the aggregate yet mostly stable, with medium-term projections finding that 1–3 million new jobs would be created against 1–2 million displaced (chiefly in livestock workers) across the EU, UK, and US, concentrated in legume, fruit, and vegetable production¹³. This puts job growth squarely within the margin for error.





POLICY RECOMMENDATIONS

1

Scale-Up Assistance

Europe's alternative protein sector can marshal public money for product development, yet struggles to scale up those products to the commercial level, leaving producers using costly equipment and unable to achieve price parity with animal-based goods⁹. Two existing EU instruments could close this gap: the Strategic Technologies for Europe Platform (STEP) funds 'critical technologies' all the way to manufacturing¹⁴, which for alternative proteins would cover fermentation and cell culture, yet omits the food-grade processing of plant proteins, which represents the sector's largest expense⁹. Its scope was already widened once to include defence in 2025 and should be widened again to include plant-based manufacturing.

Member States should also notify an alternative protein 'Important Project of Common European Interest' (IPCEI), which has since 2018 been used to mobilise tens of billions in state aid for microelectronics, hydrogen, cloud computing, and health technologies to scale up where the market alone is not sufficient^{15, 16}. Dutch start-ups, coordinated by the Mulder Institute, have already petitioned their government to unlock funds for alternative proteins through the IPCEI scheme¹⁷, signalling its usefulness to ground-level actors. Lastly, public co-funding of shared pilot and demonstration facilities would further reduce costs, letting smaller firms use open-access fermenters and extrusion lines rather than each building their own⁹.

2

Closing the VAT Gap

Plant-based alternative protein products are routinely taxed more heavily than their animal-based counterparts¹⁰, a disparity which is not required by EU law: Annex III of the VAT Directive (2006/112/EC) already permits Member States to apply reduced rates to foodstuffs and products used as substitutes for foodstuffs¹⁸. The same asymmetry is likely to re-occur for cultivated meat and fermentation-derived proteins once they reach market, given the EU's 2026 review of the Common Market Organisation Regulation which restricts cultivated meat from using conventional meat terminology alongside plant-based products¹⁹.

The European Commission should therefore issue guidance confirming that taxing an alternative protein product above its conventional equivalent is incompatible with the principle of fiscal neutrality and should call on Member States to align the two rates. The fiscal cost of lowering VAT rates on these products would be modest for overall state revenue, yet impactful for the growth of alternative proteins: modelling for Germany estimates a revenue loss of approximately €40 million (under 0.01% of total tax revenue), compared to resulting climate-related savings of roughly €62 million annually⁹. It must be noted, however, that pass-through of VAT reductions to shelf prices for consumers is rarely full, yet even partial pass-through is valuable and a negligible cost to state revenue.

3 Guaranteeing Nutritional Adequacy

Some alternative protein manufacturers fortify their products with vitamin B12, but many do not, resulting in products with lower levels than their animal-based equivalents^{9,7}. Regulation (EC) No 1925/2006 permits vitamin B12 to be added to foods but never requires it²⁰, leaving mandatory addition as a national competence based on a patchwork of twenty-seven divergent rules. The Commission should therefore introduce a minimum compositional requirement: any food marketed as a replacement for an animal-sourced product must contain at least a 'significant amount' (as defined in Annex XIII of Regulation (EU) No 1169/2011²¹) of vitamin B12, whether naturally present or added — and if added, clearly labelled as such on the front package to promote transparency. A product that claims to substitute should genuinely be a substitute, sparing consumers the burden of micro-managing their vitamin intake as they transition towards alternative proteins. Furthermore, where relevant, consumer communication should help consumers understand the specific characteristics of products containing novel food ingredients and how they compare with conventional foods.

4 Supporting Displaced Workers

The protein transition will displace livestock workers before it can employ them, and rarely in the same place: ~65% of cattle grazing land cannot grow crops, and jobs in alternative proteins tend to demand technical knowledge not gained through livestock work¹². Europe's instrument for displaced workers, the European Globalisation Adjustment Fund (EGF), already covers job losses caused by the low-carbon transition, but only triggers when 200 jobs are lost at a single employer or across one sector in adjoining regions, within months of each other²². These criteria do not align with how livestock displacement occurs; the fund should be renewed beyond its expiry in 2027 and its trigger adapted to activate on sectoral decline, so that dispersed agricultural displacement qualifies.

Member States can also support displaced workers by establishing dedicated transition funds inspired by Denmark's model, whose 2023 plant-based food plan includes €170 million open to every food-system actor¹². Lastly, the Common Agricultural Policy on which the livestock sector depends should be tied to workforce retention and reskilling commitments¹², providing a compelling incentive not to leave workers behind during the transition.





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