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A restatement of the protein transition

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Supplementary material for this article is available [online](#)

Abstract

A *protein transition* is promoted as a pathway toward a sustainable food system, but its application and progress are potentially hindered by diverse, often conflicting narratives among various stakeholders. These narratives are constituted and underpinned by statements and nurture a growing polarisation by isolation of their underlying scientific evidence. The multidimensional and interdisciplinary nature of a protein transition does not go well with an isolated approach in academia. The latter leads to fragmented and incomplete scientific evidence that fails to fully grasp the complexity of the issue, while being used to form partial statements that feed societal and political debates. Through a Restatement approach, this paper aims to (i) synthesise scientific evidence from multiple academic disciplines related to a protein transition and (ii) critically reflect on the implications of the current fragmented scientific evidence landscape of a protein transition in academia and beyond. The Restatement is structured into three sections: Background, Context, and Impacts, with subsections that each cover 4–17 statements, with a total of 68 statements. We connected each statement to its supporting scientific evidence which revealed the complexity of how evidence is related and interpreted, in addition to the inconsistent use of terminology and resulting ambiguities. The main takeaway from the Restatement is that a protein transition cannot be reduced to a single message of a dietary shift but that it should be approached more holistically, while using the available evidence within the appropriate context and critical consideration of the methodologies used to obtain that evidence. This Restatement can be used by researchers and decision-makers working toward more sustainable food systems in the European Union and beyond, to understand the contexts and methods that are not within their own field of expertise. In addition, we stress that overcoming polarisation in a protein transition largely relies on critical reflections of the assumptions, interests and power dynamics shaping the protein transition debate.

1. Introduction

Animal-source foods have become central in discussions around human health and environmental sustainability, especially in high-income countries where they provide the majority of proteins in the diet

(Sexton *et al* 2019), while also being a major driver for climate change (Poore and Nemecek 2018, Xu *et al* 2021). Protein, being the main macronutrient in many animal-source foods, is often positioned as fundamental for re-envisioning the needed transformations in food systems and society, leading to

what is known as the concept of a *protein transition*¹⁰ (Katz-Rosene *et al* 2023). In scientific literature, a protein transition in high-income countries is defined as a shift from diets rich in animal proteins to diets richer in plant and novel alternative protein sources (Duluins and Baret 2024a). In addition, a protein transition is widely promoted in the European Union (EU) as a pathway to a sustainable food system by various actors, including industry, civil society, not-for-profit organisations, researchers, and public health agencies (Aiking and de Boer 2020, European Commission 2024b). The EU has encouraged the cultivation of protein crops since the 2013 Common Agricultural Policy (CAP) reform (EU CAP Network 2013) and has promoted the reduction of red and processed meat consumption through its Farm to Fork Strategy (EU Commission 2020). Similarly, various member state governments, such as the Netherlands, have adopted national goals for shifting the balance of animal- and plant-based protein consumption (Gezondheidsraad 2023). In addition, over half of European meat consumers report actively reducing their meat consumption (ProVeg International 2024), and various retailers have adopted specific targets for the sales of plant-based proteins (Crossmedia 2025).

At the same time, this development faces considerable counterforces. While the Farm to Fork Strategy included a wider legislative agenda for food system reform, it has largely been dismantled in more recent years (Candel and Daugbjerg 2025). Food system actors with a stake in the current regime, such as meat producers' associations, have actively opposed a reduction in animal-source foods consumption (Sievert *et al* 2021, Wood *et al* 2025). Moreover, public policies still favour the livestock sector over the alternative protein sector (Vallone and Lambin 2023), while the CAP continues to mainly support animal-based production (Kortleve *et al* 2024). In addition, circulating public messages around animal protein consumption are often ambiguous. To illustrate, the role of aquatic animal-source protein in a protein transition is inconclusive (Farmery *et al* 2017) as shifting from terrestrial animal sources to seafood could positively contribute to essential fatty acid intake (Gil and Gil 2015), and reduce greenhouse gas emissions (MacLeod *et al* 2020) but could also increase human health risks due to heavy metal accumulation (Hellberg *et al* 2012), and cause ecosystem damage and animal welfare issues through fishing methods (Garratt and McCulloch 2022, Jaureguiberry *et al* 2022). Multiple actors present their own, often competing narratives on protein transitions that

reflect different interpretations of environmental sustainability, health, economic viability, social equity, and divergent interests (Béné and Lundy 2023).

These observations show that the aims, means, and trajectories of a protein transition remain highly debated among different groups of actors (iPES Food 2022, Katz-Rosene *et al* 2023, TABLE Debates 2024, Voigt *et al* 2024, Duluins and Baret 2024b). Competing narratives not only shape market dynamics but also influence how stakeholders evaluate the feasibility and desirability of various 'protein futures' (Katz-Rosene *et al* 2023, Wood *et al* 2025). Moreover, such narratives can result in a 'dialogue of the deaf' where meaningful engagement with the concept is hindered by the absence of shared evidence and an understanding of plural onto-epistemologies (van Eeten 1999, iPES Food 2022, Katz-Rosene *et al* 2023).

In addition to the wide range of actors and narratives, a protein transition spans multiple academic disciplines, each contributing scientific evidence with a high degree of specialisation which can result in an isolated examination of issues rather than a systems perspective (Gasparatos *et al* 2008). Consequently, critical dimensions and interrelations, including trade-offs, may be insufficiently considered and can reinforce oversimplifications, overlook key nuances, and leave assumptions unchallenged (Even *et al* 2024). This can ultimately exacerbate miscommunication, reinforce division among actors, and perpetuate existing power dynamics (Béné and Lundy 2023, MacKillop and Downe 2023, Kelstrup and Jørgensen 2024). Recognising the role of science in societal and policy narratives and debates (iPES Food 2022, Galli *et al* 2023), our primary focus in this paper is on scientific evidence underpinning these narratives. Rather than challenging the concept of a protein transition as such, the aim is to tie down the underlying knowledge claims that often form the foundation of different narratives to their scientific evidence in the form of a Restatement (Oxford Martin School 2024).

Restatements aim to synthesise complex bodies of knowledge in a way that is accessible to policymakers and other stakeholders, ensuring that evidence is communicated clearly while acknowledging areas of ongoing debate (Oxford Martin School 2024). Restatements are positioned somewhere between a traditional scientific paper and a collective endeavour of clarification. The novel format reflects the nature of the topic and our goal of making complex ideas more accessible by critically engaging with the diverse knowledge landscape. The objectives of this paper are to i) synthesise scientific evidence from multiple academic disciplines related to a protein transition, and ii) critically reflect on the implications of the current fragmented scientific evidence landscape of a protein transition in academia and beyond. This paper consists of two equally relevant parts: the Appended

¹⁰ Italics are used to indicate that the term's meaning is context-dependent. For clarity and readability, we apply italics selectively rather than consistently, using them only where most relevant.

Restatement, which focuses on objective i) and the Main Paper, which addresses both objectives. The Restatement (Appendix A in supplementary data), through its comprehensive scope, aims to provide an overview of the many dimensions involved in the protein transition. It may serve as a valuable resource for scientists and food systems stakeholders new to the field, offering a foundation for understanding and interpreting current debates and scientific evidence. More broadly, it is intended to support all actors involved in studying, discussing, and making decisions related to a protein transition within the context of sustainable food systems in the EU and beyond.

2. Methodology

2.1. Scope

This paper focuses exclusively on a *protein transition* in the EU for the following reasons. First, the protein transition is a hot topic across various levels of societal organisation in the EU, including political initiatives, private sector strategies, and media (Good Food Institute 2021, European Parliament 2023, Niranjana 2024, van Vugt and Nadeu 2025). Second, the EU acts as a unified political and economic union in agricultural matters due to its CAP and Common Fisheries Policy, shared and exclusive competencies, and single market structure, allowing it to harmonise policies and negotiate as one entity. Third, in Europe, the largest share of the average per capita daily protein consumption comes from animal-source foods (Our World in Data 2021a, 2021b, Miller et al 2022, Parlasca and Qaim 2022). Fourth, there is high potential to mitigate environmental impacts through dietary changes due to the high greenhouse gas emissions, land and water footprints of the current average EU diet (Aleksandrowicz et al 2019, Mertens et al 2021, Rancilio et al 2022, Adesete et al 2023, EUMOFA 2024), and the significant environmental challenges stemming from the EU livestock sector, including nutrient pollution and biodiversity loss (Kok et al 2006, Leip et al 2015, De Pue and Buysse 2020). Finally, the EU's global influence as the world's leading exporter of animal-source proteins and its dependence on imports for seafood, highlight the importance of shifts in EU agricultural and dietary practices for health, environmental, and economic reasons (Swartz et al 2010, Guyomard et al 2021, EUMOFA 2024). Given the dietary and cultural diversity within the EU, the Restatement could also offer valuable insights for other regions.

2.2. Restatement process

Restatements, derived from law, clarify and organise common law by restating legal doctrines into principles or rules, making it more accessible and synthesising fragmented or inconsistent cases (Biondo 2024).

Building on this concept, the 'Restatements project' was initiated by the Oxford Martin School to 'review the natural science evidence base underlying areas of current policy concern and controversy' so that policymakers would be better informed to make evidence-based decisions (Oxford Martin School 2024). In their process, a draft summary is developed by an established author team as a list of statements relevant to the topic. The draft is circulated among a group of 30–40 stakeholders from academic and non-academic backgrounds for feedback, allowing each statement to be coded based on its level of evidence. Although Restatements provide a synthesis of the current scientific literature, they stand out from other review methodologies in the way evidence is gathered (i.e., including non-academic stakeholders in the process), the structure in which it is presented (i.e., a synthesis with underlying evidence in Appendix A), and the use of accessible language for an informed but not technically specialist audience.

The topic of a protein transition posed several challenges on the original methodology applied by the Oxford Martin School: (i) it was difficult to identify experts who would be able to assess the scientific content spanning across multiple academic disciplines; (ii) within each individual discipline, the number of experts was limited because the total protein transition community is relatively small at this stage; and (iii) what is considered uncontested can vary depending on underlying ontologies, making it challenging to apply a uniform standard across all statements. Therefore, two modifications from the Oxford Martin School methodology were introduced. First, our process involved only academic experts, aligning with our goal of engaging reflexively with scientific knowledge. Second, we chose not to assign levels of evidence (e.g. 'strong evidence', 'some supporting evidence', or 'expert opinion') to each statement due to the relatively small number of experts available to assess each statement, and the nature of the statements themselves. Unlike the Oxford Martin School's approach, which is anchored in a more (post-)positivist framework typical for the natural sciences, our statements drew on disciplines whose ontologies fundamentally challenge the very notion of what can be defined as uncontested or universally valid knowledge.

Two authors (OD and PB) developed an initial draft of the Restatement by building on existing research (Duluins and Baret 2024a) and drawing from their knowledge of the literature. This first version was therefore grounded in their expertise in the protein transition and served as a foundation for broader interdisciplinary engagement. To examine the comprehensiveness of the draft and identify missing perspectives, scientists from various disciplines involved in the protein transition were invited to provide feedback (appendix B). Ten scholars from different

Box 1. Definitions of terms used in the Restatement and Main paper.

Protein transition: Describes a dietary shift away from human diets rich in animal-source proteins to diets richer in alternative protein sources (Duluins and Baret 2024a).

Animal proteins: protein foods that are derived from animal sources, excluding terrestrial invertebrates and animal cell cultures.

Terrestrial animal proteins: Foods sourced from land-based livestock production, including red meat (cows, pigs, sheep, goat and deer), poultry (chicken, turkey, duck and goose), eggs (chicken, duck and other birds), and dairy products (milk, cheese, yoghurt and butter from farmed mammals).

Aquatic animal proteins: Foods sourced from aquatic animal production systems, including fish and aquatic invertebrates such as shellfish and cephalopods. These can be farmed in aquaculture (in marine or freshwater environments), or wild caught through fisheries.

Alternative proteins: protein foods that are derived from plant, invertebrate or fungi sources, and animal cell cultures. Commonly part of diversified diets and/or used to replace animal proteins in human diets.

Plant proteins: Whole foods rich in protein^a (legumes, cereals, nuts) and their products (tofu, tempeh, seitan), some of which are processed using techniques long utilised in Asia but less established in other parts of the world, including Europe (Arora *et al* 2023).

Novel proteins: Foods derived from plants, algae, fungi, terrestrial invertebrates, microbes, or animal cell cultures produced using novel techniques (developed after 1950, Rubio *et al* 2020). This includes terrestrial invertebrates (insects, earthworms, snails), cultured meat, plant-based dairy alternatives (milk, cheese and yoghurt), plant-based meat alternatives, microbial protein (e.g., mycoprotein), plant-based eggs*, and grass-protein.

*While we acknowledge the emergence of plant-based eggs to replace eggs from birds, due to data availability this product was not included in this paper (Nájera Espinosa *et al* 2024).

Livestock production (sector): encompasses all stages of terrestrial animal protein production, including rearing, processing, distribution and trade, and marketing of final products. We differentiate between ruminant animals, such as cattle (beef and dairy) and goats, and monogastric animals, such as pigs and poultry.

Seafood production (sector): encompasses all stages of aquatic animal protein production in aquaculture and wild capture fisheries, marine and freshwater. This includes catching of wild fish and aquatic invertebrates from natural habitats through fishing, farming or cultivation of same animals in controlled environments, processing, distribution and trade, and marketing of final products.

^a**Protein-rich crops:** crops that are rich in proteins (usually having a protein content of more than 15%) and used for food or feed, typically undergoing minimal transformation and processing, such as leguminous crops or nut trees (European Commission 2018). The products of these protein-rich crops are classified in this paper as ‘plant proteins’.

Feed proteins: the protein transition and the consumption of animal proteins by humans is closely connected with the production of proteins for animal feed. Although the Restatement does not have a focus on animal feed, it may be occasionally addressed in relation to human consumption of proteins.

universities and research institutes across France, the Netherlands, Sweden, Ireland, Italy, Germany, and the UK contributed to this initial review round. These experts were asked to evaluate the evidence claims in each statement and to provide detailed feedback, including references where relevant. This process helped expand the Restatement’s reference base in an inductive, non-systematic manner. All experts who contributed during the first feedback round were invited to join the author team, and five of ten accepted. To ensure a broader disciplinary representation and to address gaps in expertise, additional scholars were invited later in the process, expanding the author team by two. All authors included in the process have interdisciplinary backgrounds and engage professionally with the protein transition. Based on their input, the structure of the paper was thoroughly revised, leading to the categorisation of statements into three ‘context’ categories—i.e., economic, policy and power, and consumer—or one of the

four ‘impact’ categories—i.e., human health, environment, animal welfare and health, and economy. The organisation of the content into statements and sub-statements emerged iteratively through multiple rounds of discussion and refinement. Each section was drafted by one author team member with relevant subject-matter expertise and internally reviewed by a second author team member with foundational knowledge in the area. The statements were refined through iterative discussions, first within author pairs, then collectively, to ensure shared agreement on their formulation.

2.3. Terminology

We acknowledge the ongoing debates among various actors regarding the meanings of the term protein transition and associated terminology (e.g., ‘alternative proteins’). Defining the protein transition as a dietary shift away from animal-source foods is often context-specific, particularly relevant in regions

characterised by protein overconsumption, especially animal-source proteins (Simon *et al* 2024). While this paper approaches a protein transition as a dietary shift within such contexts, we also recognise its broader global relevance and the importance of adapting the concept to address the unique nutritional, cultural, and ecological needs of diverse regions (Simon *et al* 2024). Moreover, we acknowledge its inherent connection to the entire food system, expanding beyond dietary considerations. We address multiple food system aspects, including consumption, production, and economic aspects, to create a foundation for interdisciplinary future work. For this paper, we have chosen to retain the terms specified in Box 1, as they are recognised within the EU context and used in the scientific literature (Aiking and de Boer 2020, Béné and Lundy 2023, Duluins and Baret 2024a, European Commission 2024a).

3. Results

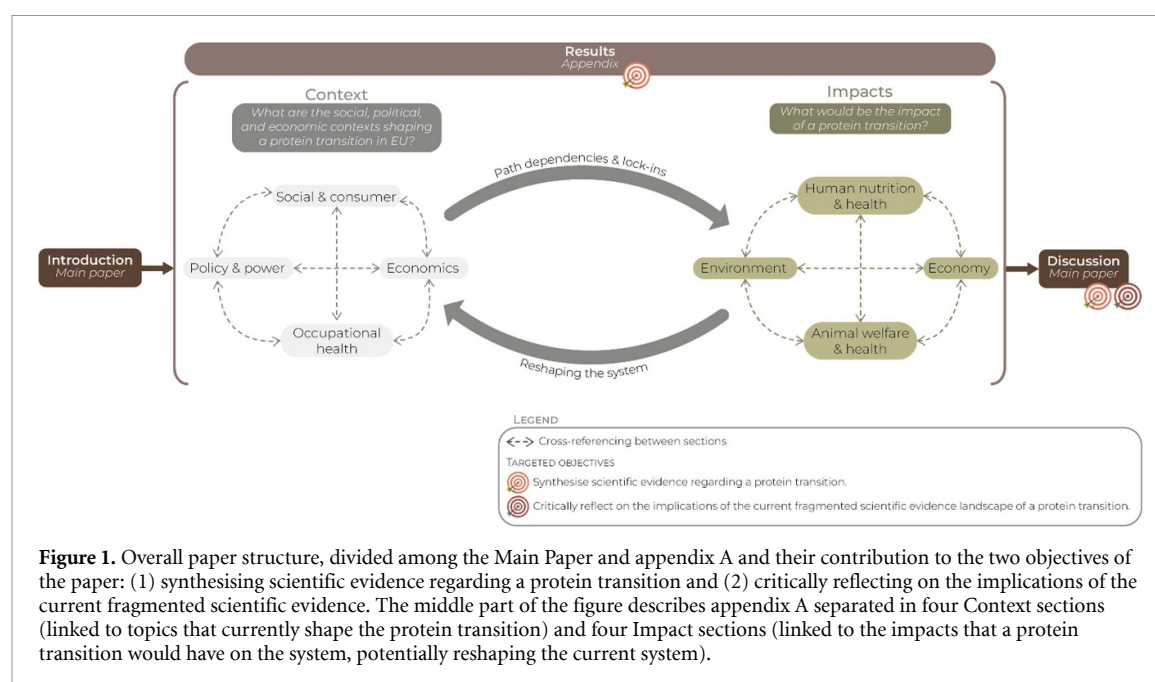
The Restatement (Appendix A) presents the detailed results of the process of mapping out the evidence base surrounding a *protein transition* in a list

of numbered statements structured into three main sections (table 1). The Background section (statements 1–5) sets the stage by providing an overview of what proteins are, their role in human nutrition, and a historical perspective on the growing focus on proteins. The Context section (statements 6–28) examines the social, political, occupational health, and economic contexts shaping a protein transition. The Impacts section (statements 29–68) investigates the current impacts of animal protein consumption, and the potential impacts of a protein transition on human health, the environment, animal welfare and health, and the economy. While the Context section focuses on factors that currently shape a protein transition, either by enabling or disabling, the Impact section focuses on evaluating the impacts of changes rather than examining the processes that drive those changes.

Each statement is organised as follows: the numbered sections provide a synthesis of the relevant scientific evidence and the lettered subsections offer detailed information and supporting references for each piece of evidence. Moreover, links between statements are provided, allowing one to navigate

Table 1. Structure of the Restatement by main sections, addressed topics, and the number of statements included in each section.

	Section	Topics	Number of statements
Background	n/a	Introduction to protein, historical perspective.	5
Context	Economic	Agricultural economy in the EU, economic role of the livestock sector, subsidies from the Common Agricultural/Fisheries Policy, protein imports, protein-rich crops sector.	4
	Political/power	Agricultural and fisheries policies and their conflicting objectives, EU policies and national initiatives supportive of a protein transition, inequity in food distribution, consolidation of power, spread of (mis)information.	10
	Consumer	Protein consumption in the EU, drivers for consumer preferences and choices between protein sources, willingness for dietary change, gap between dietary intentions and eating habits.	5
	Occupational health	Physical and mental health hazards for livestock and arable farmers, and fishermen, concerns for slaughterhouse employees.	4
Impacts	Human health	Protein recommendations, current protein intake, animal-source protein vs plant-source and novel proteins, micronutrients from protein foods, non-communicable disease risks from protein foods, food safety.	10
	Environment	Methods for measuring environmental impacts, comparison of protein sources on their global warming potential, nitrogen, land and water use, positive and negative impacts on biodiversity.	17
	Animal welfare	Different views, indicators and tools, most concerning welfare issues, slaughterhouse considerations.	7
	Economy	Changes and opportunities for employment in alternative proteins, a just transition for farmers, affordability of plant-based diets, market interventions.	6



the document from one section to another. Figure 1 provides a visual overview of the paper's structure, highlighting the division between the Main Paper and Appendix A, and illustrating how each component contributes to the dual objective of on the one hand synthesising scientific evidence on the protein transition across various contextual and impact dimensions, and on the other hand critically examining the impacts of the fragmented nature of that evidence.

4. Discussion

This paper aimed to address the much-felt need to navigate the vast body of scientific evidence underpinning the contentious political, and societal narratives concerning a *protein transition* in the name of sustainability (iPES Food 2022, Béné and Lundy 2023, Bryant *et al* 2024a, Duluins and Baret 2024b). Despite the complexity of food systems and the actors involved, sustainability is often approached in silos, marked by compartmentalised approaches and fragmented information scattered across disciplines (Gasparatos *et al* 2008, Fischer *et al* 2024). A Restatement provided a useful approach and working tool for grappling with the complexity and contested nature of the concept of a protein transition. It has allowed compiling and organising information from various disciplines into a coherent set, making it more accessible to scientists from different disciplines, which we believe will pave the way for broader use and more interdisciplinary work. We thereby recognise the co-existence of, and potential tensions between aims to synthesise for comprehension and reinforcing siloes through synthesising. Even more, although this Restatement is the result of a

collaborative effort in scientific sense-making, bringing together co-authors with diverse epistemologies, ontologies, and worldviews, no Restatement is ever a 'final Restatement'. Therefore, despite efforts to be comprehensive and to diversify the team, and conduct multiple rounds of collaborative exchanges, further work can more broadly reflect the plurality of scientific disciplines and backgrounds.

4.1. The role of terminology in the protein transition debate

The Restatement process surfaced critical questions on terminology, underscoring the complexity of semantics for problem definitions, perceptions of solutions, and legitimisation in food systems sustainability work and beyond (Leeuwis *et al* 2021, Marquardt and Nasiritousi 2022). Mirroring previous academic debates (Guthman *et al* 2022, iPES Food 2022, Baudish *et al* 2024) our discussions also struggled with the relevance of the term 'protein transition', alongside how its framing can be limiting in scope and potentially misleading. It reduces food to a protein delivery system, overshadowing broader nutritional, social, political, economic, cultural and ecological dimensions (Guthman *et al* 2022, Leroy *et al* 2022), and neglecting the importance of dietary diversity and balance, central to health and well-being (Bianchi *et al* 2022; Allegretti and Hicks 2023). History also reminds us that an overemphasis on protein has, at times, led to a misdiagnosis of malnutrition, ignoring calorie and nutrient deficiencies and accessibility issues (McLaren 1974).

This protein-centric framing is especially problematic in high-income countries by paradoxically framing protein foods as quintessential while lessened importance and consumption are the necessary actions for food system sustainability (Simon

et al 2024, Duluins and Baret 2024b). Focusing public debates on questions of ‘should we eat less meat and more plant-based food?’ also narrows the agenda to individual dietary choices without due reflection of the embedded worldview (Resare Sahlin 2024), while the Restatement emphasizes that transitions are fundamentally political and structural in nature (Chatterjee and Subramaniam 2021).

In addition, the dynamics and meanings of a protein transition vary across contexts. While the Restatement focuses on the EU (with relevance for other high-income settings), most low- and middle-income countries face different challenges, including underconsumption of protein and diverse cultural, religious, and economic factors shaping food systems (Adesogan *et al* 2020). This highlights the existence of multiple protein transitions at stake (Hinrichs 2014), dissonant to the singularity implied by the terminology. Lastly, terminology plays a strategic role in shaping policy directions. Phrases like ‘alternative proteins’ uphold animal proteins as the legitimising standard, often favouring substitution rather than reduction approaches (Kanerva 2021). Instead, discussions framed around ‘food systems transitions’ open up more inclusive and transformative pathways (Jenkins *et al* 2024), including the need to better integrate overlooked areas such as aquatic animal proteins (Koehn *et al* 2022), tensions between transitions and transformations (Stirling 2015), and the need for a recentering on justice and equity (Baudish *et al* 2024).

4.2. Power and the use of evidence in the protein transition debate

The Restatement highlights that a protein transition is deeply entangled with political and industry interests, a concern widely recognised by scholars (Clay *et al* 2020, Howard *et al* 2021, Guthman *et al* 2022, IPES Food 2022). Despite the complexity of scientific insights into the protein transition, public discourse is often dominated by narratives that align with the interests of powerful stakeholders, particularly industry actors invested in maintaining the status quo (Duluins and Baret 2024b). For example, the push for novel meat and dairy alternatives has been championed by some industry players as a silver-bullet solution (BCG Global 2022, Bryant 2022), reinforcing a market-driven, techno-fix approach that prioritises substitution over broader dietary shifts. This narrow framing overlooks the need for more fundamental changes, such as reducing overall consumption of terrestrial animal-source protein rather than merely replacing it with alternatives (Herzon *et al* 2024, Duluins and Baret 2024b). At the same time, industry narratives that critique alternative proteins often serve to protect existing meat and livestock markets rather than to foster systemic change (Santo *et al* 2020).

The production, interpretation, and strategic use of evidence are embedded in social, political, and institutional power structures, shaping policy debates and public perceptions. Reductionist narratives based on the selective use of statements such as ‘Livestock farming is essential for providing complete human nutrition’ or ‘Livestock allows food production on land unsuitable for crops’ are widely used to justify existing practices (Torpman and Rööös 2024). While these narratives contain elements of truth, they can be used to obscure the broader scientific debate on the environmental impacts of industrial livestock production and the need for dietary shifts in most population groups (Torpman and Rööös 2024). This selective use of evidence, whether it is intended or unintended, reinforces dominant narratives while sidelining more systemic discussions about sustainable food futures (Wood *et al* 2025). Furthermore, it misses and ignores the value-based nature of sustainability and its evidence (Fischer *et al* 2024, Lazurko *et al* 2025).

Resistance to policy change remains a significant obstacle to food systems sustainability progress, particularly in Europe, where both demand-side measures to reduce meat consumption and legislative efforts to regulate production face strong opposition (Temme *et al* 2020, Bryant *et al* 2024b). This resistance is driven not only by transnational corporations and the meat industry but also by agricultural organisations that actively shape the discourse and influence policy (Olausson 2018, Lazarus *et al* 2021, Krattenmacher *et al* 2024). These actors exert considerable financial and political power (Vallone and Lambin 2023, Clapp *et al* 2025), often framing policies aimed at reducing animal protein consumption as threats to economic stability, rural livelihoods, and cultural identity (Sievert *et al* 2021). By amplifying these concerns while downplaying scientific evidence that supports dietary transitions, they contribute to policy inertia and public confusion.

Decision-makers operate in a landscape where evidence is strategically mobilised to support conflicting narratives. This is not simply a matter of misunderstanding, lack of nuance or evidence, but a reflection of deeper power dynamics and, at times, the deliberate misrepresentation of evidence. Overcoming the dominance of reductionist or self-serving arguments requires more than engaging with a broader evidence base. It also requires governance structures that can critically assess whose knowledge counts, under what conditions, and in whose interests. Strengthening transparency, ensuring the inclusion of diverse epistemologies, and creating safeguards against undue influence from vested interests are essential steps toward more equitable and legitimate food systems governance (cf. Turnhout *et al* 2021, Krattenmacher *et al* 2024). The Restatement promotes an integrated approach to scientific research, grounded in reflexivity, accountability, and pluralism.

It encourages researchers to critically examine their discipline-specific assumptions, integrate diverse disciplinary perspectives, and hold both researchers and institutions accountable for siloed thinking and (deliberately) overlooking of the broader system. While this Restatement cannot deter strategic misuse of evidence by powerful actors, it can support other stakeholders in noting it or help to mitigate unintentionally employing scientific evidence in a narrow or partial way by equipping them with a more comprehensive and interdisciplinary understanding of the field.

4.3. The role of scientific evidence in shaping protein transition narratives

The Restatement compiles a wide range of existing knowledge on the context and impacts of a protein transition and engages in a reflexive scientific process in relation to a protein transition. In many cases, it was not possible to ascertain whether a statement could be considered as ‘uncontentious’, as its validity can vary depending on the context in which it would be used, how it would be measured or with which epistemological framing it would be viewed. Unlike the natural sciences, which prioritise objective, generalizable knowledge claims rooted in (post-)positivist traditions, many social sciences and humanities refute the idea of objectivity, instead emphasising the contextual and constructed nature of knowledge.

These differences reflect deeper epistemological divides, where scientific disagreements often stem not only from data gaps or inconclusive findings, but also from various interpretations shaped by values, world-views, methodologies, and disciplinary assumptions. Emerging evidence may also be dismissed as too immature for firm conclusions, highlighting the challenges scientists and practitioners face in navigating complex, value-laden issues in a way that information retains its meaning and can be appropriately used for action (Kates 2011, Chambers *et al* 2022).

Narratives entail ideas of which actions should be taken and often originate from different ways of interpreting and combining information. For example, facts such as ‘meat is a source of iron’ and ‘ruminants can graze’ can be combined into diverging statements, e.g., one warning that reducing meat consumption risks iron deficiency, another arguing that ruminants are essential for grassland maintenance. These in turn, support different narratives: advising against a reduction of meat consumption, and advocating for the maintenance of ruminant production to preserve European grasslands. Statements also differ depending on methodologies and/or values used to generate them. Figures for protein consumption levels can for example differ depending on methods used or reference values for protein requirements, leading to different interpretations of over- or underconsumption.

The Context section of the Restatement additionally highlights the politics and power dynamics shaping a protein transition, again pinpointing that change is not primarily contingent on the production of more evidence (Leeuwis *et al* 2021). Debates extend beyond the evidence itself to encompass how it is framed and presented, reflecting differing interpretations and visions of food systems, priorities, and societal goals (Béné *et al* 2019, Béné 2022). Narratives rarely gain traction as a reflection of the validity of their claims, but because of support by powerful actors or alignment with prevailing political or economic interests (Wood *et al* 2025). It is potentially underestimated how certain statements are amplified by those with vested interests and a strong influence in the scientific and political spheres (Clare *et al* 2022).

These tensions underscore that scientific arguments are inseparable from the value-based nature of sustainability (Béné *et al* 2019), equity (Baudish *et al* 2024), and geopolitics (Merino 2022). Recognising this can help clarify why common understanding remains elusive concerning certain ‘facts’, and why transparent decision-making must integrate both evidence and value systems.

5. Conclusion

This Restatement on *the protein transition* has involved a broad compilation of statements, knitting together insights across various academic disciplines and synthesising them in one place to make them more accessible, understandable, and transparent for those who require guidance in the overwhelming scientific evidence landscape related to a protein transition. This ‘defragmentation’ of scientific evidence is a first step from preventing the unintended selective use of statements into one-sided narratives, as stakeholders with a specific expertise cannot be expected to oversee and grasp all aspects of a protein transition. The Restatement thereby highlights the multiplicity of dimensions that must be considered in navigating the protein transition to overcome challenges of polarisation and contested narratives—while acknowledging that this alone is not sufficient. Instead, these contested narratives are deeply rooted in how stakeholders frame, interpret, and sometimes strategically deploy statements. Thus, achieving meaningful progress demands more than ‘better’ evidence. It requires transparency of the existing evidence and methods used to obtain this evidence, more reflexive and inclusive use of terminology, the recognition of diverse perspectives and values, and the political and financial interests of those involved in the discussion. In an era of increasing political and epistemological fragmentation and polarisation, we call on all actors, within and

beyond academia, to critically reflect on the assumptions, interests, and power dynamics shaping protein debates.

Data availability statement

All data that support the findings of this study are included within the article (and any supplementary files).

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