

# Meat & dairy analogues: *Opportunities, challenges and next steps*

Insights from WBCSD's multistakeholder dialogue series



# Background and context

*Supporting a sustainable and healthy balance of plant and animal-based food is vital to ensure basic human health and to reduce the food system's impacts on climate and natural resources. This transformation requires coordinated work to ensure accessibility, affordability and availability of a variety of high-quality and nutritious diets for people across different cultures and incomes.*

There is growing enthusiasm amongst food system stakeholders around plant-based, fermented and cultivated alternatives to animal-based meat and dairy. These so-called meat and dairy analogues are structurally and aesthetically similar in taste and texture but differ in composition to their animal-based counterparts. These products are made possible through innovations in food science and technology. In the past decade investment and consumption of meat and dairy analogues has increased significantly.

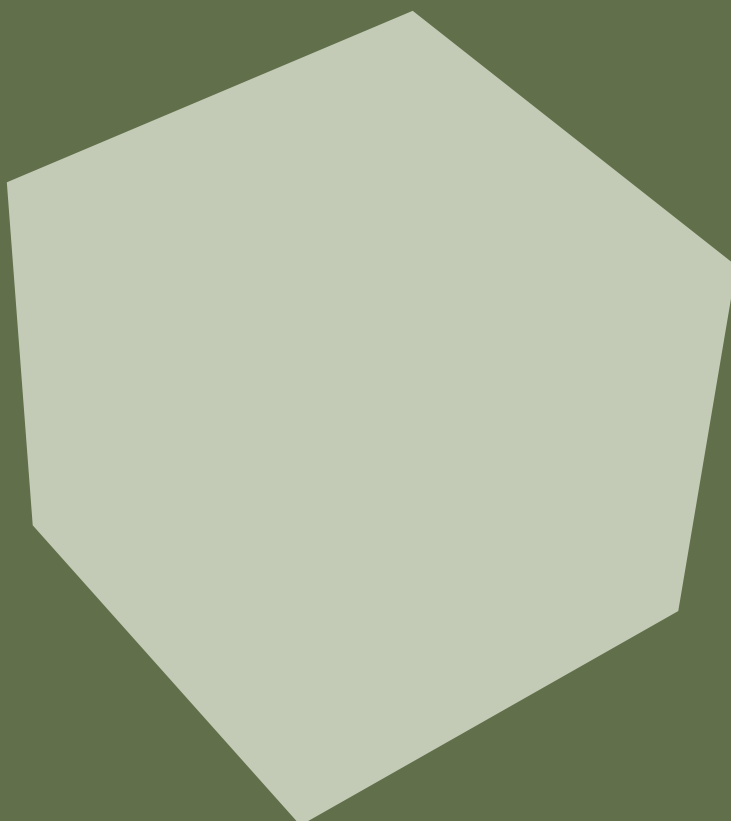
To sustainably scale the production and uptake of meat and dairy analogues globally, there are several critical hurdles and levers that need to be addressed with urgency. These primarily related to how these products should fit into healthy diets and how they are produced within a just and regenerative agricultural system.

This paper aims to articulate these dynamics and offers actionable solutions for the private sector and other value chain actors to carry forward—both independently and collectively.

When taking action to scale meat and dairy analogues, there are three key populations to consider:

1. Consumers who overeat animal protein when considering both health and environmental needs;
2. People who do not yet overconsume animal proteins but are on a trend to do so unless we change course; and
3. The world's poorest who do not have enough access to animal proteins today.

Ensuring that the animal-based food consumption of the first two population groups is within planetary and health boundaries will only be possible through systemic engagement of all key food system stakeholders.



# Learning and planning for action through multistakeholder dialogue

*In May and June of 2023, the World Business Council for Sustainable Development (WBCSD) brought together stakeholders virtually from across the global food ecosystem to share diverse perspectives on the role of meat and dairy analogues in delivering healthy and sustainable diets.*

A collaborative written conversation (called Reflect-Share-Blend) was launched with all participants ahead of the dialogue sessions, creating an opportunity to engage with the dialogue substance and one another. The process, facilitated by experts from the partner organization, Convene, aimed to:

- Help stakeholders understand and navigate trade-offs between nutrition quality, affordability, accessibility, livelihoods impacts and environmental impacts of various types of meat and dairy analogue products based on the latest science;
- Offer a safe space for individual and collective expression in identifying a role for meat and dairy analogues in healthy and sustainable diets; and
- Enable stakeholders to discuss and recommend pathways to address system-level and individual company challenges in scaling protein diversification.

Representatives from food and agriculture companies; nutrition and environmental non-profits; industry associations; policy and civil society organizations; academia; and consumer groups contributed insights related to nutrition science, innovation, product formulation, food processing, regulation, consumer preferences and policy, and addressed two interrelated themes:

- **Dialogue 1: The nutrition and health** impacts of meat and dairy analogue products. *What do we know about the nutrition and health impacts of these products, where are the gaps in understanding these impacts, and what are recommendations for the future?*
- **Dialogue 2: The production system** to supply meat and dairy analogues at scale. *What are current constraints and opportunities within agriculture and processing systems to supply ingredients for analogue products, and how can we ensure that a regenerative and just agriculture system is central to the transition?*



# Key areas for action identified through the dialogue series

The following section captures four key areas for action identified in the dialogue series, along with challenges, solution pathways and primary stakeholders best placed to lead the solution pathways. Note that they are not exhaustive, but represent possible priority actions.






→ **Stakeholder key**



## 1. Strengthen the data-backed evidence and narrative on the impacts of meat and dairy analogues

Challenge	Solution pathways	Primary stakeholders
More objective research is needed to understand the health impacts of different types of analogue products.	<ul style="list-style-type: none"> <li>→ Increase the scientific evidence-base and alignment on health effects of different types of analogues (plant, algae, fungi, cultivated). This includes further pre-competitive research on topics such as: <ul style="list-style-type: none"> <li>– Clinical trials on biomarkers and long-term outcomes with many participants looking at quantitative epidemiological data on health outcomes from consuming analogue products for various population groups with diverse nutritional needs (such as improvements in cardiometabolic health).</li> <li>– Increased insights into broader set of characteristics of plant-based analogues (beyond just protein quality) such as fats, amino acids (intact) fiber, pre/probiotics, bioactive compounds, phyto nutrients, and anti-nutrients such as phytates (present naturally in beans and cereals) that inhibit iron absorption.</li> <li>– The impact of processing on nutrients in meat and dairy analogues.</li> </ul> </li> <li>→ Disclose methods and funding sources for research to ensure transparency of findings.</li> </ul>	S, G, PS
Nutrient guidelines, such as national food policies and dietary frameworks, do not specifically address meat and dairy alternatives, which poses a barrier to providing consumers with a clear message on how these products fit into a healthy diet.	<ul style="list-style-type: none"> <li>→ Continue the scientific discussion to reach consensus on evidence-based guidelines for analogue nutrient thresholds and provide clear guidelines to help consumers navigate around these products. This includes analysis on the nutritional benefits of a diversified protein intake in diets (e.g., maximum levels of saturated fat, salt, and inclusion of protein, fiber and micronutrients).</li> <li>→ Incorporate analogues into national and regional (e.g. EU) food-based dietary guidelines, leveraging initiatives such as the EAT-Lancet that can help set clear targets for food manufacturers, enhance consumer awareness and ensure analogues' recognition in other food policies as well as public health recommendations.</li> </ul>	S, G
There is a lack of nutrition data publicly available on finished products since most data focuses on individual ingredients.	<ul style="list-style-type: none"> <li>→ Include meat and dairy analogues in national food databases.</li> <li>→ Make up-to-date composition data (beyond on-pack data) from businesses available through food composition databases to be used for academic research.</li> </ul>	G, PS
There is not a consistent or clear narrative tailored to different audiences that reflects current research about the role of analogues in healthy and sustainable diets.	<ul style="list-style-type: none"> <li>→ Align on and communicate coherent, digestible narratives aimed at stakeholders across the value chain, as well as consumers and policymakers that outlines the role of analogues in healthy and sustainable diets.</li> </ul>	PS, G, S, C, I, F, WBCSD




## 2. Ensure a just transition for consumers and agri-food workers in the shift to meat and dairy analogues

Challenge	Solution pathways	Primary stakeholders
<p>Affordability and accessibility are barriers in most regions where meat and dairy alternatives are more expensive than their animal-based counterparts.</p>	<ul style="list-style-type: none"> <li>→ Implement policies that incentivize meat and dairy alternatives across the value chain to encourage nutritious and affordable diets. Examples include repurposing environmentally and/or socially harmful subsidies; allocating scarce resources to a more diverse set of plant-based foods (including ingredients for plant-based products); increasing government spending on R&amp;D around meat and dairy alternatives; supporting companies in the diversification of their products; and increasing availability of plant-based products for consumers.</li> <li>→ Implement policies that support reflecting the true value of food including social and environmental impacts.</li> </ul>	
<p>Analogue products are often not culturally relevant across all cuisines.</p>	<ul style="list-style-type: none"> <li>→ Ensure cultural relevance by understanding and utilizing local dietary patterns and traditional local plant foods in product innovation and offerings.</li> </ul>	
<p>More nuanced decision-making is needed that considers a dietary just transition e.g., in some countries, a strictly plant-based diet may have nutritional gaps due to poor variety of plant foods.</p>	<ul style="list-style-type: none"> <li>→ Create analogue products that meet diverse populations' nutrient needs and are culturally relevant for local cooking culture and diets, where appropriate.</li> <li>→ Valorize indigenous and traditional plant foods in product innovation.</li> </ul>	
<p>There are context-specific production challenges to scale meat and dairy analogues, leading to inequities in capturing transition benefits.</p>	<ul style="list-style-type: none"> <li>→ Enhance the potential for local production by applying local knowledge and sourcing and ensuring cultural relevance in innovation.</li> <li>→ Utilize a place-based, seasonal approach to cropping that considers local biodiversity.</li> <li>→ Share technical knowledge between global consumer packaged goods companies and local small- and medium-sized enterprises to enable broad participation in the sector.</li> <li>→ Invest in the development of local technology and capacity in developing countries to allow participation in the alternatives sector.</li> <li>→ Create a business environment which equitably redistributes value along the supply chain through transparent reporting, due diligence and inclusive supplier engagement.</li> </ul>	
<p>Farmers (including smallholders) need to be included in the discussion of a transition toward a sustainable and healthy balance of plant and animal protein and offered capacity building, technical and financial resources as well as other incentives to de-risk transition.</p>	<ul style="list-style-type: none"> <li>→ Ensure inclusive multistakeholder dialogue.</li> <li>→ Develop narrative and inclusive processes that acknowledge the challenges and trade-offs for farmers in a way that encourages dialogue and collaboration over conflict. For example, design interconnections and clearer guidance between plant and animal farming to move away from a polarizing debate to a positive reframing that encompasses the role for grazing livestock.</li> <li>→ Generate fiscal policy incentives at a national level (tax breaks, loans for technology, subsidies), mobilize finance and develop progressive sourcing models to ease transition and de-risk farmer action.</li> <li>→ Empower knowledge-sharing amongst farming communities to share best practices that are conducive to better socio-economic outcomes.</li> </ul>	

### 3. Progress behavior change for consumers and companies toward the incorporation of analogues

Challenge	Solution pathways	Primary stakeholders
A growing wave of legislation aims to curb the consumption of analogues, such as bans on the use of traditional meat nomenclature for plant-based (e.g., a soy patty cannot be marketed as a soy burger) and eliminating plant-based milks in schools.	<ul style="list-style-type: none"> <li>→ Communicate clearly and in tailored ways with policymakers to help them understand the importance of analogues for reaching climate, nature, and health targets, and the impact of different regulations.</li> <li>→ Include plant diversification in national food pathways being developed by countries within the Food System Summit(s) framework.</li> </ul>	G PS
Classification of plant-based alternatives as ultra-processed raises doubt for consumers on their role as 'healthy foods.'	<ul style="list-style-type: none"> <li>→ Establish evidence-based narrative that clearly outlines the nutritional benefits and drawbacks of plant-based alternatives.</li> <li>→ Improve analogues' nutritional profile regarding nutrients to limit and nutrient density.</li> <li>→ Be critical, adaptable and continue to improve upon evolving science around ultra-processed foods, such as the research around the underlying mechanisms.</li> </ul>	G S
Consumers are confused about how plant-based choices and animal-based meat and dairy products should fit in their diets, including a struggle to understand the nutritional characteristics of diverse meat and dairy analogue ingredients.	<ul style="list-style-type: none"> <li>→ Build trust to help consumers understand analogue products through transparent and evidence-based marketing, clear labelling, and appropriate positioning in retail environments and restaurants.</li> <li>→ Leverage flexitarian messages that empower consumers to eat a variety of plant-based products along with animal products in their diets.</li> <li>→ Educate consumers through multiple channels on the nutritional benefits of foods containing analogue ingredients, including oat, soy nuts, rice, fungi, insects and algae</li> <li>→ Per findings in line with action area #1 described above, integrate a mix of analogue and animal-derived choices into government-endorsed dietary guidelines to support consumer diet diversity through schools and public health institutions.</li> </ul>	PS C G S
Consumers see animal-based meat and dairy products as having multiple purposes in their households and have difficulty incorporating alternatives into everyday dishes.	<ul style="list-style-type: none"> <li>→ Explore and research blended products that may be more approachable for consumers, such as blended meat-mushroom hamburger patties or dairy alternatives with flaxseed.</li> <li>→ Introduce analogues to young consumers in school to cultivate comfort and new norms.</li> <li>→ Make plant-based foods the default option on restaurant menus, or at least more prominent and not segregated into vegetarian sections.</li> <li>→ Develop innovative products that consider consumers' existing weekly routines and habits.</li> </ul>	S PS C
Many consumers do not find healthy and sustainable alternative products to be appealing, even for a first taste.	<ul style="list-style-type: none"> <li>→ Conduct further research on the language, narrative, packaging and more that can drive uptake of these products—especially in heavy meat-eating cultures.</li> <li>→ Educate consumers on their food choices and impacts, leveraging culturally appropriate storytelling that can make consumers feel more connected to farmers and the climate.</li> <li>→ Innovate to create products that are more appealing, including how they look and taste.</li> <li>→ Avoid the use of 'vegan' and 'vegetarian' terminology in marketing efforts, on menus, and on-pack.</li> <li>→ Communicate the key ingredients in products with consumers, rather than labeling as 'plant based.'</li> <li>→ Describe the sensory appeal of the products through marketing and packaging.</li> </ul>	S PS C
Consumers desire more clarity on analogue production processes and impact.	<ul style="list-style-type: none"> <li>→ Offer transparent stories to consumers that clarify the farm-to-plate journey and impact of ingredients used in each product.</li> </ul>	PS C

#### 4. Establish innovative business models to help drive the transition

Challenge	Solution pathways	Primary stakeholders
<p>Investors often prioritize highly profitable food technology companies with less emphasis on environmental, social, and nutritional aspects.</p>	<ul style="list-style-type: none"> <li>→ Communicate with and educate a diverse set of investors (venture capital, impact investors, banks) as important partners in the food system transformation.</li> <li>→ Facilitate co-investment with specialized start-ups focused on meat and dairy analogues.</li> <li>→ Create a roadmap to embed nutrition into ESG reporting.</li> </ul>	
<p>Businesses and consumers often have 'protein tunnel vision' when it comes to meat and dairy analogues instead of considering overall nutritional benefits of plant-based ingredients, which can limit innovation.</p>	<ul style="list-style-type: none"> <li>→ Research and communicate the nutritional benefits of plant-based meat and dairy analogues beyond protein with business leaders and consumers.</li> <li>→ Directly address campaigns from the animal-based sector that aim to minimize the health benefits of analogue products by focusing solely on protein.</li> </ul>	
<p>Focusing on meat and dairy alternatives instead of a broader plant-based diet can distract from opportunities for new business models that benefit health and the environment.</p>	<ul style="list-style-type: none"> <li>→ Innovate new, tasty plant-based foods to complement healthy diets beyond analogues.</li> <li>→ Broaden the lens on diversity of cultural diets to open up opportunities for innovation.</li> <li>→ Promote flexitarian diets that emphasize the diversity of plant-based foods.</li> <li>→ Clarify the business case for companies across the agri-food value chain to incorporate diverse, plant-forward foods in their portfolios, i.e., how it can contribute to revenue and sustainability targets. Leverage this business case to mobilize finance.</li> </ul>	

## Further considerations on the impact *of meat and dairy analogues on farming systems*

**Crop diversification.** Crop diversification is a best practice for regenerative agriculture and can enable diet diversity. However, current plant-based analogues primarily rely on a small number of crops (such as soy, pea or oat) that are typically grown in monocultures and are also used for animal feed. Many farmers—even those who produce inputs for meat and dairy analogue products—find the transition to a multi-cropping system economically unfeasible. Overcoming this reality requires an appropriate mix of government policy reform, adequate incentives, technical capacity building, food industry investment in processing capacity and sufficient consumer demand.

**Research at scale and across contexts.** It is well-documented that plant protein production systems can bring environmental benefits; for example, growing pulses can improve soil, use less water and help decrease greenhouse gases. However, there is insufficient data and only small-scale studies on the environmental impacts of final analogue products and how they compare to animal-derived meat and dairy products across different geographies and farming schemes.

**Just rural transition.** It is imperative to consider and address all potential consequences of transitioning to more plant-based diets in communities that are heavily reliant on traditional meat and dairy production. Regenerative agriculture is not a one-size-fits-all model, as some lands are only fit to grow grass, which can be better-suited for grazing animals than producing analogue-related crops.

*The dialogues made clear that there is a need to further explore the role of meat and dairy analogue products in a regenerative agriculture system.*





# Ecosystem stakeholder roles *in the way forward for analogues*

**The food industry** plays a key role in supplying consumers with safe and tasty food choices that have positive nutritional and environmental profiles. With growing meat and dairy analogues sales, the private sector should carry out transparent and evidence-based marketing and develop affordable and accessible products that support local preferences and diverse cuisines. This will require moving beyond solely meat-focused analogues that have been the focus of industry to date, into other categories. A component of success in this effort will be building supply chain partnerships that expand innovation, technological and production capacity in regions that are currently left out of the alternative protein sector.

**Investors** can embed environmental, social and health considerations into their investment decisions to complement profit-making aims and support further growth in the meat and dairy analogue sector.

**Governments** need to use a holistic food systems lens to coordinate policies and regulations across relevant departments (i.e., agriculture, environment, health and trade), if they are to address multiple dimensions of sustainability. Governments can support consumer adoption of analogues by creating national food databases and food-based dietary guidelines that include these products and highlight their nutritional profiles beyond just protein. They can level the playing field for plant-based foods by repurposing meat, dairy and feed subsidies; minimizing food taxes for products with certain nutritional profiles; supporting new plant-based food technology research; investing in supply chain infrastructure; embedding analogues in procurement and nutrition regulations policies (e.g., public school meals); and evolving regulations to facilitate the development and adoption of meat and dairy analogues in society.

**Civil society** can advocate for analogue products that are culturally and contextually relevant, and affordable and accessible—not only as premium foods. Civil society can promote the supportive fortification of foods in communities with micronutrient deficiencies and ensure that consumer education is adequately helping people navigate these new products.

**Consumers** can use their eating choices to positively impact the environment and their health, including by implementing a flexitarian diet. Once information on nutritional quality and environmental impacts of analogue products is adequately made available to consumers, they can make informed purchasing decisions that support further industry investment and innovation toward a healthy and sustainable food system transformation.

**Researchers** can provide a deeper understanding of the combined role of meat and dairy analogues on human health and the environment through modeling and long-term observational studies combining both nutrition and sustainability dimensions, as well as randomized control trials on biomarkers. They can provide food data science to consumers, industry and government that distinguishes between the metabolic benefits of different analogue ingredients, and further the understanding of anti-nutrients, bioavailability of micronutrients, protein source diversity and the effect of processing on the plant matrix. This will require further measurement and metrics at different stages of the value chain.

**The philanthropic community** has an important role to play in helping to plug funding gaps in the solution pathways identified above in the global transition to healthy sustainable diets. Donor investment can provide or match funding in research; plant-based food processing; determining the most effective approaches to fortification; new technologies; and upskilling and supporting farmer communities toward a sustainable and equitable plant-forward future.

## **Conclusion**

WBCSD will continue to align the sector to establish meat and dairy analogues as a part of a healthy and sustainable food system.

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# Acknowledgements

## DISCLAIMER

This publication has been released in the name of WBCSD. It is the result of collaborative efforts by representatives from member companies and external experts. It does not reflect all viewpoints of each company or partner, nor does their engagement in the process necessarily constitute an endorsement of the work.

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## About WBCSD

The World Business Council for Sustainable Development (WBCSD) is a global community of over 220 of the world's leading businesses, representing a combined revenue of more than USD \$8.5 trillion and 19 million employees. Together, we transform the systems we work in to limit the impact of the climate crisis, restore nature and tackle inequality.

We accelerate value chain transformation across key sectors and reshape the financial system to reward sustainable leadership and action through a lower cost of capital. Through the exchange of best practices, improving performance, accessing education, forming partnerships and shaping the policy agenda, we drive progress in businesses and sharpen the accountability of their performance.

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