7.1 Diversify the Global Protein Supply via Alternative Proteins

What problem is your solution addressing?

FAO projects a 52% increase in the global demand for meat by 2050 relative to 2012, but there are not enough resources on our planet to meet this demand. It is well established that the diversification of protein production and consumption can achieve transformative results in planetary and human health, including conserving land for habitat, preserving biodiversity and mitigating climate change. Furthermore, alternative proteins (including meat, seafood, and dairy products) can help address key social and health challenges of the coming decades such as reducing the risk of bacterial contamination, improving animal welfare, reducing antimicrobial resistance as well as risks of another pandemic.[1]

While plant-based alternatives have started to flourish in a number of markets, accelerating the diversification of proteins that are appealing, accessible and affordable will be key to feeding 10 billion people within planetary boundaries by 2050. There are a wide range of 'game changing solutions' to achieve the required protein diversification and democratization globally, regionally, and locally. In order to enable dietary shifts, a large toolkit is required. Options include, but are not limited to:

- Plant-based and algae-based protein that mimic the taste and texture of their animal-based analogues. This makes it easy to integrate into daily life without the need to acquire new skills or change cooking behaviour, as they can easily be used in traditional cuisines.
- Fermentation-derived proteins created via bacteria and fungi used as 'hosts' to produce different types of proteins from various substrates such as CO2 and sugar.
- Cultivated meat, which is real animal meat cultivated directly from animal cells.

To increase the diversity, availability, accessibility, and affordability of alternative proteins while ensuring that they are healthy and contribute to achieving rapid progress on biodiversity loss and climate change, progress is needed across stakeholders on a number of issues including science-based targets, regulation and policy-making, research, as well as targeted investment.

How does your proposition address the problem?

The proposed game changer aims to accelerate the scale up of alternative proteins by:

1) Building evidence on science-based targets, pathways, key challenges and opportunities;
2) Developing strategies to scale up alternative protein production and consumption; and
3) Mobilizing cross-sector alliances to deploy these strategies at global and local levels.

Building evidence and learning from existing as well as new research and development efforts touching on pathways, key challenges and opportunities

Protein diversification will vary based on local contexts.[2] 'Protein pathways' thus need to be developed that include specific targets, suitable product portfolios, regulatory and social barriers to overcome, and solution spaces at the global, regional and country levels. This will allow each stakeholder group to tailor its efforts and activities towards successful alternative protein solutions – in the form of adapted regulatory and policy frameworks, adapted investments, adapted communication, etc.

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[1] This proposal recognizes that a diversification of proteins should include a supply of protein-rich crops such as legumes, potentially complemented by limited quantities of animal products for all, and the alternative proteins noted in this proposal.

[2] E.g., crops from local agricultural producers used as inputs, product types that suit local preferences and are easily integrated into local cultures and traditions

Developing strategies to scale up alternative protein production and consumption
Based on the findings of the first step described above, key stakeholder groups will need to develop strategies to adapt and tailor their efforts towards various alternative protein solutions by:

- Investing in open-access R&D to create new markets for entrepreneurs and farmers, including indigenous and women farmers, and offer affordable nutrition at scale.
- Providing infrastructure & workforce development loans (including support for re/upskilling of workforce to adapt to new production methods), debt-based financing or production purchase guarantees to incubate startups (prioritizing those in LMICs) and accelerate take-up.
- Developing science-based, agile guidance such as in the form of an ESG scorecard for all types of proteins, to facilitate decision-making by investors, food value chain companies & civil society.
- Developing favourable regulatory, labelling and marketing rules, allowing alternative proteins to be desirable, affordable and accessible, and not impede market entry for alternative proteins.

Mobilizing cross-sector alliances to deploy these strategies
Cross-sector alliances will need to be mobilized at the global, regional and local levels, to deploy the strategies identified in the second step described above.

Is this a new solution or an existing solution that needs scaling?
Existing solution

Which organisation/s, institution/s or groups of individuals are associated with the solution?
World Business Council for Sustainable Development (WBCSD), The Good Food Institute (GFI), World Resources Institute, CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), Compassion in World Farming, Brighter Green.

What is the scientific evidence that supports your proposition?

- See references embedded throughout plus:
- Clark, MA, et al. 2020. Global food system emissions could preclude achieving the 1.5° and 2°C climate change targets. Science 370, 6517, http://doi.org/10.1126/science.aba7357
- World Economic Forum. (2019). Meat: The Future A Roadmap for Delivering 21st-Century Protein. http://www3.weforum.org/docs/WEF_White_Paper_Roadmap_Protein.pdf
- Mertens, E., Biesbroek, S., Dofková, M., et al., 2020. Potential Impact of Meat Replacers on Nutrient Quality and Greenhouse Gas Emissions of Diets in Four European Countries. Sustainability 12, 6838. https://doi.org/10.3390/su12176838
- Santo, R.E., Kim, B.F., Goldman, S.E., et al., 2020. Considering Plant-Based Meat Substitutes and Cell-Based Meats: A Public Health and Food Systems Perspective. Front. Sustain. Food Syst. 4, 1–23. https://doi.org/10.3389/fsufs.2020.00134
- Khan S, Loyola C, Dettling J, Hester J, Moses R., 2019. Comparative environmental LCA of the Impossible Burger with conventional ground beef burger. Quantis USA and Impossible Foods. https://impossiblefoods.com/mission/lcaupdate-2019/
- CE Delft, 2021. LCA of cultivated meat. Future projections for different scenarios. https://cedelft.eu/publications/rapport-lca-of-cultivated-meat-future-projections-for-different-scenarios/

Is this idea applicable to a particular geography, demography, landscape or other type of setting?

This is globally applicable because it builds on local cultural and social assets. It is relevant to the global South and global North, where most of the alternative protein technologies have so far been developed.

Who are the main actors that would put this action into place?

This is a multisector initiative requiring the action of the following actors: citizens and consumers, NGOs, academia, government, businesses, media, donors and investors.

Source and process

Multiple proposals submitted via wave two of solution generation process combined by:

- Emily Hennessee, **The Good Food Institute (GFI), Innovation Lead for AT#2**
- Emeline Fellus, **World Business Council for Sustainable Development (WBCSD), AT#2 Leadership Group member**

Reviewed by:

- Dhanush Dinesh, CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)
- Adrian Leip, European Commission, Joint Research Centre (JRC)
- Angela Wright, Chief Scientific Adviser, Compassion in World Farming
- Carol McKenna, Special Advisor, Compassion in World Farming
- Mia MacDonald, Executive Director, Brighter Green, and deputy co-lead, WS1 of UNFSS AT2