

About PATH

PATH is a global organization that works to accelerate health equity by bringing together public institutions, businesses, social enterprises, and investors to solve the world's most pressing health challenges. With expertise in science, health, economics, technology, advocacy, and dozens of other specialties, PATH develops and scales solutions—including vaccines, drugs, devices, diagnostics, and innovative approaches to strengthening health systems worldwide. We work in more than 70 countries to transform bold ideas into sustainable solutions that improve health and wellbeing for all.

As a leader in global nutrition, PATH develops and advances data-driven, market-based approaches to improve nutrition around the world, addressing key market gaps through innovation. Our vision in nutrition is equitable access to optimal nutrition for vulnerable populations.

Looming challenges for sustainable nutrition

The global burden of malnutrition is unacceptably high. Worldwide, an estimated 22 percent of children under the age of five are stunted, and 8 percent are wasted.¹ Low-quality diets that are lacking in essential vitamins, minerals, proteins, and other nutrients are a key contributor to this burden. One of the greatest challenges we face for the future is sustainably meeting the nutritional needs of a dynamic, growing global population.²

Animal-source foods—such as meat, poultry, fish, and dairy—are important components of diverse diets and provide high-quality proteins and other essential nutrients that promote optimal growth and development.^{3,4} As populations and incomes grow, the global demand for animal-source foods is projected to increase substantially, particularly in many low- and middle-income countries.⁵

However, livestock production is highly resource intensive and has significant environmental impacts, requiring considerable land, water, and energy inputs. Global food production is responsible for roughly one-quarter of all greenhouse gas emissions, most of which are related to livestock.^{6,7} Livestock production is also a contributor to water pollution, land degradation, overfishing, and antimicrobial resistance.⁶



PATH/Gabe Biencycki.

New food frontiers

Given these challenges, sustainable, high-quality alternatives to protein from livestock have the potential for significant transformative impact for both people and the planet. For example, through a novel process known as cellular agriculture, animal protein found in milk, meat, and eggs can be manufactured in laboratory settings through cell cultures, using microflora, such as yeast, as catalysts for fermentation.⁸ The resulting “cultured” proteins are identical to those produced through traditional livestock farming and can be substituted as ingredients in existing or new food products. In addition, many plant-based products have also been developed to closely imitate the sensory properties of animal-source foods.

Sustainable, high-quality alternatives to proteins from livestock have the potential for significant transformative impact for both people and the planet.

These alternative proteins have significantly lower resource requirements than conventional animal proteins from livestock and will likely lead to reductions in cost, potentially increasing access to protein for consumers in low- and middle-income settings. Increased availability and consumption of alternative proteins could also improve food safety, reduce the presence of

antibiotics in diets, and increase product shelf life, yielding additional benefits for many vulnerable populations.

Our work in alternative proteins

Although alternative protein products have recently received increased attention in many high-income countries, their implications for low- and middle-income settings are not yet well understood. To help address this gap, PATH and our partners are exploring the potential for alternative proteins—including cultured proteins and selected plant-based alternatives—in emerging markets. Together with the International Food Policy Research Institute, Duke University, and The Nature Conservancy, we are assessing the extent to which alternative proteins—particularly egg and dairy—can play a meaningful role in supporting global nutrition in a more sustainable way than those produced through livestock.

Our work on this project has four components:

1. **Conducting a market landscape assessment and a market analysis for alternative proteins.** We are mapping the manufacturer and product landscape for alternative proteins and estimating the potential market size for low- and middle-income countries.
2. **Characterizing the enabling environment for alternative proteins.** To understand factors that will influence alternative protein production and consumption in low- and middle-income contexts, we are investigating the policy and regulatory environment in key geographies and assessing the perceptions of potential buyers.
3. **Modeling the health/nutrition, agricultural, and environmental impacts of alternative proteins.** Through a set of integrated modeling efforts, we are estimating the impacts of alternative protein production

techniques and resulting products on health/nutrition, agricultural, and environmental outcomes in select low- and middle-income settings.

4. **Assessing the potential for alternative protein production to generate carbon offsets.** We are evaluating whether or not carbon offsets are feasible for select types of alternative proteins. If these offsets are feasible, we will estimate how much of a financial benefit they would provide—and whether or not this benefit could impact their production.

Partners

This project is supported by The Rockefeller Foundation and is implemented through the Bridge Collaborative, a partnership of:



Learn more

To learn more about PATH's work in alternative proteins, please contact Katharine Kreis at kkreis@path.org.

BRIDGECOLLABORATIVE

To learn more about the Bridge Collaborative, visit: www.bridgecollaborativeglobal.org.

¹ Development Initiatives. *2018 Global Nutrition Report: Shining a Light to Spur Action on Nutrition*. Bristol, UK: Development Initiatives; 2018. Available at <https://globalnutritionreport.org/>.

² Wu G, Fanzo J, Miller DD, et al. Production and supply of high-quality food protein for human consumption: sustainability, challenges, and innovations. *Annals of the New York Academy of Sciences*. 2014;1321:1–19. doi:10.1111/nyas.12500.

³ Headey D, Hirvonen K, Hoddinott J. Animal source foods and child stunting. *American Journal of Agricultural Economics*. 2018;100(5):1302–1319. doi:10.1093/ajae/aay053.

⁴ Ghosh S. Protein quality in the first thousand days of life. *Food and Nutrition Bulletin*. 2016;37(1 suppl):S14–S 21. doi:10.1177/0379572116629259.

⁵ Alexandratos N, Bruinsma J. *World Agriculture Towards 2030/2050. The 2012 Revision*. ESA Working Paper No. 12-03. Rome; FAO: 2012. Available at <http://www.fao.org/docrep/016/ap106e/ap106e.pdf>.

⁶ Steinfeld H. *Livestock's Long Shadow: Environmental Issues and Options*. Rome: FAO; 2006. Available at <http://www.fao.org/docrep/010/a0701e/a0701e00.HTM>.

⁷ Springmann MH, Godfray CJ, Rayner M, Scarborough P. Analysis and valuation of the health and climate change cobenefits of dietary change. *Proceedings of the National Academy of Sciences*. 2016;113(15):4146–4151. doi:10.1073/pnas.1523119113.

⁸ Waschulin V, Specht L. *Cellular Agriculture: An Extension of Common Production Methods for Food*. Washington, DC; The Good Food Institute: 2018. Available at <http://www.gfi.org/images/uploads/2018/03/Cellular-Agriculture-for-Animal-Protein.pdf>.



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Mailing Address
PO Box 900922
Seattle, WA 98109 USA

Street Address
2201 Westlake Avenue
Suite 200
Seattle, WA 98121 USA

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