BIFAD

Facilitating Increased Demand for Healthy Diets

Evidence on Approaches Across the Food System in Feed the Future Contexts

FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

USAID
FROM THE AMERICAN PEOPLE

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A virtual roundtable with the following experts was held in July 2024 to share successful case studies, evidence-based practices, and examples of collaborative initiatives on increasing demand for healthy diets:

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ACRONYMS & ABBREVIATIONS

BD4FS	Business Drivers for Food Safety	**MDD**	Minimum dietary diversity
BIFAD	Board for International Food and Agricultural Development	**MNF**	Marketplace for Nutritious Foods
BOP	Base of the pyramid	**MSME**	Micro-, small- and medium-sized enterprise
CI	Confidence interval	**NCD**	Non-communicable diseases
cRCT	Cluster randomized controlled trial	**NFSI**	Nutrition Friendly Schools Initiative
FAO	United Nations Food and Agriculture Organization	**OR**	Odds ratio
Food-EPI	Healthy Food Environment Policy Index	**PPP**	Public-private partnerships
FOPL	Front-of-pack labeling	**RCT**	Randomized Controlled Trial
FRESH	Focusing Resources on Effective School Health	**SBC**	Social and behavioral change
GDP	Gross domestic product	**SDGs**	Sustainable Development Goals
GIFNA	Global database on the Implementation of Food and Nutrition Action	**SSB**	Sugar-sweetened beverage
HIC	High-income country	**SUN**	Scaling Up Nutrition
ICT	Information and communication technology and digitization	**UNDP**	United Nations Development Programme
INFORMAS	Research, Monitoring and Action Support	**USAID**	United States Agency for International Development
IPC	Interpersonal communication	**WHO**	World Health Organization
LMICs	Low- and middle-income countries		

EXECUTIVE SUMMARY

To achieve the world's ambitious development goals, food systems must provide healthy[1], safe, accessible, and affordable diets for everyone, especially disadvantaged and nutritionally vulnerable groups like smallholder producers, traders, and consumers in low- and middle-income countries. However, as food systems undergo rapid and drastic changes globally, they are struggling to meet these critical needs simultaneously. One in five preventable deaths is now being attributed to lack of access to healthy diets, and it is estimated that between 2 and 3 billion people cannot afford a healthy diet based on local foods and prices.[2] While this is in part a result of poor supply of nutritious foods, incentivizing consumers, private sector companies, and government procurement systems to focus on healthy diets and demand that nutritious foods be available to all is a critical part of the global food systems dialogue that is often ignored. The concept of demand creation for healthy diets includes individual- and household-level demand, but also efforts from the private-sector to purchase, transform, and market nutritious food products and from the public-sector through procurements, incentives, and regulations.

Optimal nutrition is crucial for achieving the United States Agency for International Development's (USAID) broader mission of ending extreme poverty, promoting resilient and democratic societies, and enhancing national security and prosperity. The USAID Multi-Sectoral Nutrition Strategy (2014–2025)[3]

Incentivizing consumers to consume healthy diets and, consequently, demand for nutritious foods, is a critical part of the global food systems dialogue that is often ignored.

and the U.S. Government's Global Food Security Strategy (2022–2026)[4] have put forward agendas to elevate nutrition, food security, and food safety. There is a need, however, for a better understanding of the range of demand-creation actions across the food system that should be prioritized, as well as the effectiveness of actions in influencing patterns of purchasing and consumption in low- and middle-income contexts relevant to USAID's Feed the Future and nutrition priority geographies.[5,6]

USAID, therefore, requested that the Board for Food and Agricultural Development (BIFAD)—an independent advisory committee to USAID on food, nutrition, and agriculture—provide recommendations to inform the Agency's strategic policies, programming, and investments on the availability of safe and affordable nutritious foods and, specifically, to gather evidence on how to promote the demand for healthy diets.

The overarching goal of this study was to assess the availability of relevant evidence, identify evidence gaps, recommend areas for additional

[1] For the purposes of this report, we define "healthy diets" as per the principles within the joint statement by the Food and Agriculture Organization of the United Nations and the World Health Organization. https://iris.who.int/bitstream/handle/10665/379324/9789240101876-eng.pdf?sequence=5

[2] FAO, IFAD, UNICEF, WFP and WHO. (2024). The State of Food Security and Nutrition in the World 2024 – Financing to end hunger, food insecurity and malnutrition in all its forms. https://www.fao.org/publications/home/fao-flagship-publications/the-state-of-food-security-and-nutrition-in-the-world/en

[3] USAID. Multi-sectoral Nutrition Strategy. https://www.usaid.gov/nutrition-strategy

[4] US Government. Global Food Security Strategy. https://www.usaid.gov/what-we-do/agriculture-and-food-security/us-government-global-food-security-strategy

[5] Feed the Future countries included: Bangladesh, Burkina Faso, Democratic Republic of Congo, Ethiopia, Ghana, Guatemala, Haiti, Honduras, Kenya, Liberia, Madagascar, Malawi, Mali, Mozambique, Nepal, Niger, Nigeria, Rwanda, Senegal, Tanzania, Tajikistan, Uganda, and Zambia. Herein, for simplicity, we refer to these as Feed the Future countries.

[6] Nutrition Priority countries: https://www.usaid.gov/nutrition/countries

research, and use existing evidence to develop a prioritized set of opportunities for USAID consideration. This report identifies important areas for USAID's investment in measurement and evaluation, as well as entry points for action within food systems for nutritious foods. The review, prepared for BIFAD, presents evidence on effective policies and interventions that:

1. Enhance the supply of nutritious and safe foods, including through off-farm activities by micro-, small- and medium-sized enterprises (MSMEs) across supply chains and markets.
2. Support demand for healthier diets post-farmgate, including purchasing and consumption of healthy diets by individuals, households, private sector companies, and governments.

This review includes policies, programs, and interventions—both USAID's and those of other donors and implementers—that have undergone formal, published, and publicly available evaluations.

For the purposes of this report, "demand" is defined as the actual or desired procurement choices made by individuals, food businesses, and/or public sector programs relating to foods that are consumed by individuals or households, used by companies as ingredients to create food products, or included as components of institutional feeding activities (such as school meals). Demand is underpinned by many factors, including but not limited to purchasing power relative to the variable prices of foods, information access, knowledge about health attributes of food products, convenience, peer influence over perceptions of desirability, and cultural values. The actual purchases made by individuals, households, private sector companies, and governments play a significant role in shaping food environments through the dynamic interplay of supply and demand.

> *In this report, "**demand**" is the actual or desired procurement choices made by individuals, food businesses, or public sector programs relating to foods that are consumed by individuals or households, used by companies as ingredients to create food products, or included as components of institutional feeding activities.*

Several conceptual frameworks of food systems for diets and nutrition were used to organize and narrow the focus of the evidence reviewed in this report. These include the High-Level Panel of Experts on Food Security and Nutrition Conceptual Framework of Food Systems for Diets and Nutrition[7], the USAID Bureau for Resilience and Food Security (REFS) Food Systems Conceptual Framework[8], the Nutrition-Sensitive Value Chain Framework[9], developed by the International Fund for Agricultural Development, and the NOURISHING Framework, developed by the World Cancer Research Fund International.

This report reviewed evidence on approaches at the storage and transport; processing and packaging; distribution, retail and marketing; and consumption stages of the food system aimed at increasing the demand for nutritious, safe foods, as shown in Figure ES1.

Key inputs to the brief included a review of the peer-reviewed and grey literature and perspectives shared at an expert roundtable convened in July 2024.[10] The report outlines

[7] High Level Panel of Experts on Food Security and Nutrition. (2017). Nutrition and Food Systems. https://openknowledge.fao.org/server/api/core/bitstreams/4ac1286e-eef3-4f1d-b5bd-d92f5d1ce738/content

[8] USAID. (2021). The Bureau for Resilience and Food Security (RFS) Food Systems Conceptual Framework. https://www.usaid.gov/feed-the-future/document/rfs-food-systems-conceptual-framework

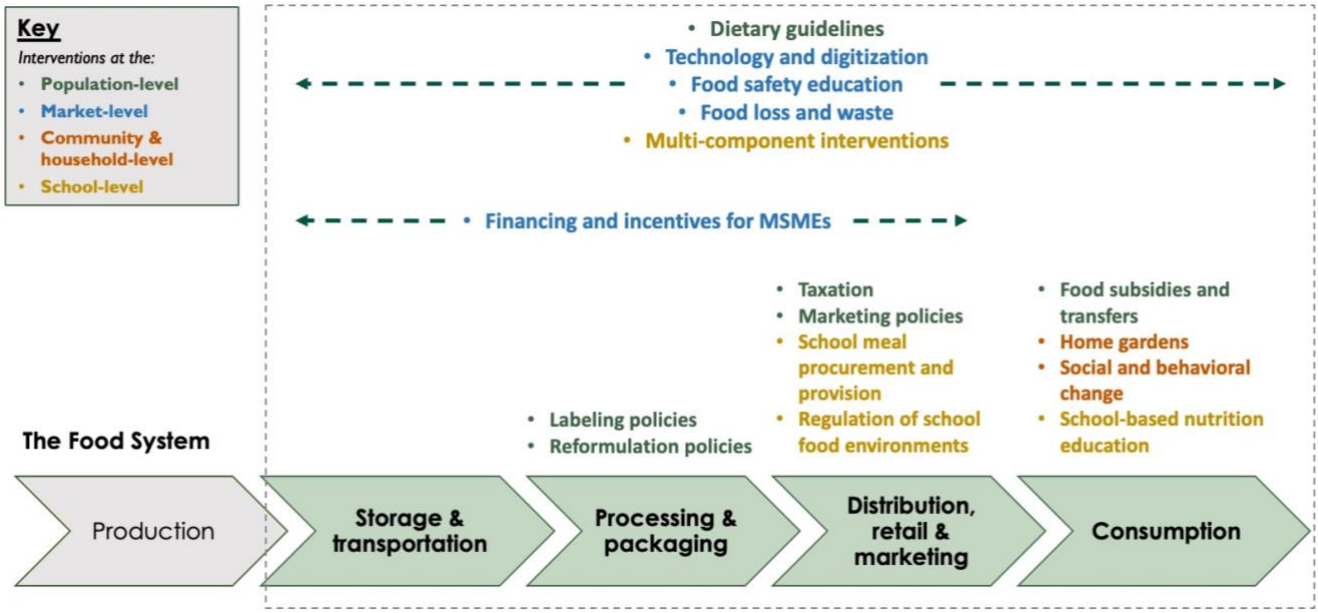
[9] IFAD. (2018). Nutrition-sensitive Value Chains Framework: Strategies and Entry Points. https://www.ifad.org/documents/38714170/41098185/NSVC+4-pager+ENG+WEB.pdf/d11b2326-c832-e85b-2474-3fdb8a374ac9?t=1554814198000

[10] The authors reviewed evaluations of single-component and multi-component food environment interventions or programs relating to food availability; food accessibility; food marketing and promotion; food safety; and food pricing. Evaluations included those that assessed the following primary outcomes: direct measures of consumption; diet quality; share of total expenditure on food; and share of food expenditure on non-staple foods;

preliminary findings from the available evidence, implications, and opportunities for future USAID programming aimed at increasing demand for healthy diets.

This report was prepared with support from Tetra Tech, implementing partner of the BIFAD support contract, and in coordination with BIFAD, USAID's Chief Nutritionist, and USAID/REFS Center for Nutrition.

FIGURE ES1: FOCUS OF THE REPORT IN THE CONTEXT OF THE FOOD SYSTEM



and/or the following secondary outcomes: food security; anthropometric outcomes; and diet-related health outcomes. The review was limited to evaluations of interventions in Feed the Future and USAID Nutrition Priority countries. A full description of the methodology can be found in Annex 1.

Findings

Current evidence relevant to Feed the Future countries encompasses a patchwork of actions largely implemented by the public sector focused on social safety nets to reduce prices and promote diverse diets in low-income households, or behavior change interventions to improve the purchasing and consumption of nutritious foods within households.

The tables below use a color code to summarize both quantity and quality of evidence for each area of intervention analyzed in this evidence review. "Substantial," "some," and "limited" are used to describe the quantity of evidence (i.e., the number of studies in an area). The authors based the quality of evidence on the level of confidence in the certainty of effect of the intervention. "High confidence," "medium confidence," and "low confidence" in the certainty of effect are used to describe the quality of systematic reviews and primary studies that had minimal, some, or significant risks of bias, respectively.

Types of interventions were color coded based on both quantity and quality determinants. Green shading indicates interventions for which quantity of evidence is substantial and there is a high confidence of certainty of effect. Yellow shading indicates there is some but insufficient high confidence evidence and/or a mix of evidence with high and medium confidence in the certainty of effect. Orange shading indicates that the quantity of evidence related to the intervention is limited and/or there is low confidence in the certainty of effect of existing evidence.

Key findings on **public sector interventions** include:

Food transfers	This review identified **substantial evidence (high confidence)** across various Feed the Future countries on the effectiveness of fiscal policies such as unconditional or conditional cash or in-kind transfers directed at households and individuals (women and children) to improve dietary diversity. Additionally, there is growing interest in designing and implementing cash-plus programs that offer complementary services or inputs that reinforce the developmental impact of the cash benefits.
Social & behavior change interventions	This review identified **some evidence (high confidence)** on the effectiveness of social and behavior change interventions such as nutrition counseling and education directed at communities or households to improve diets. Importantly, multicomponent interventions that target a range of factors that inhibit or motivate healthy behaviors reported greater impacts on diets as compared to single informational interventions.
Subsidies & taxes	This review identified **limited evidence (low confidence)** on how excise taxes or subsidies influence consumer purchasing patterns and consumption of healthy diets.
Regulatory policies	This review identified **limited evidence (low confidence)** on the adoption and enforcement of regulatory policies such as national food-based dietary guidelines, as well as marketing and labeling of food and beverages high in saturated fats, trans fats, free sugars or salt in markets and schools.
Food safety education	This review identified **limited evidence (low confidence)** on food safety interventions at community or household levels to educate consumers on safe food.
School meal & nutrition education programs	This review identified **limited evidence (low confidence)** on school meal programs and nutrition education interventions that improve dietary intake in children and adolescents.

Of the available evidence on private sector interventions and innovations, the review identified several constraints and opportunities to increase the supply, add value, and increase demand for nutritious and diverse foods.

Key findings on **private sector interventions** include:

Financial access interventions	This review identified **some evidence (medium confidence)** on effective business models such as public-private partnerships and cooperatives to help raise financial capital and enhance distribution and market access for MSMEs.
Food loss & waste interventions	This review identified **limited evidence (low confidence)** of food loss and waste interventions that improved the supply of safe and nutritious foods in markets.
Food safety interventions	This review identified **limited evidence (low confidence)** on food safety interventions and technologies within supply chains and in markets that improved the supply of safe and nutritious foods.

Evidence Gaps

This evidence review revealed significant uncertainty in the existing evidence regarding interventions aimed at enhancing the supply and demand for nutritious foods. Notable research gaps include:

1. ***Research in Low- and Middle-Income Countries***. Research on food environments has traditionally focused on high-income countries, leaving significant evidence gaps in low- and middle-income country (LMIC) contexts.
2. ***Better Understanding of Diverse Target Populations***. There is insufficient evidence on the effectiveness of interventions in creating demand by groups other than women and children, including men, youth, and adolescents. And almost nothing scientific on demand creation through a private sector or government lens.
3. ***Comprehensive Metrics and High-Quality Data***. There is a lack of appropriate metrics, measurement tools, and mixed-methods research that collect and use high-quality data across markets, especially related to the use of delivery platforms outside of schools to reach youth, such as social media. There is also a lack of survey data that characterize cognitive elements of food culture.
4. ***Research on Bundles of Interventions***. Few evaluations of multicomponent interventions exist. Because of the breadth of policies and interventions that may impact diets, there is the possibility that one policy or intervention may negate another's effectiveness or have unintended spillover effects (i.e., externality effects, social-interaction effects, context-equilibrium effects, general-equilibrium effects). These interactions require investigation.
5. ***Hidden Middle***. The middle of the food system is often overlooked and under researched but plays a pivotal role in consumer demand. There is a need to build the evidence base on effective interventions including social and behavior change among MSMEs (i.e., processors, packagers, distributors) to improve knowledge, attitudes, and practices on nutritious and safe foods.
6. ***Research and Evaluation of Prioritized Interventions at the Retail Level***. Greater understanding is needed on the combined effect of taxes and subsidies in the public sector and both supply and demand interventions for MSMEs in the

private sector to mitigate barriers and challenges MSMEs face and to ensure their success in increasing the availability, accessibility, and affordability of nutritious and safe foods.

7. ***Implementation Studies***. Current evaluations poorly capture implementation fidelity, including intervention exposure, quality, and cost, which are critical for replicating and scaling interventions.
8. ***Leveraging Learnings from Current Programming***. There is a need to both consolidate and leverage learnings from current Feed the Future programming, including but not limited to extending current food supply chain strategies for cash or staple crops to incentivize and promote demand for nutritious foods (e.g., a specific focus on fruits and vegetables, traditional and Indigenous crops).

Potential Opportunities for USAID

The evidence suggests several opportunities USAID could consider pursuing. The following opportunities are based on the evidence of effective interventions identified in the literature reviewed for this report. Each of these opportunities should be assessed in the context of USAID's Multi-Sectoral Nutrition Strategy and operations to determine their relevance and feasibility for USAID.

1. Multi-Sectoral Actions

Both the measurement and implementation of multi-sectoral actions is required to develop a whole-of-government approach for healthy and safe diets across the supply–demand continuum, to track progress, as well as to understand co-benefits and trade-offs across sectors. However, to date, few Feed the Future countries have conducted a landscape assessment of current policies, including the identification and prioritization of policies and multi-sectoral actions for the creation of nutritious food environments. This stocktaking will help identify gaps in policy and programmatic activities and allow for opportunities to promote and strengthen coordinated planning and programming with multi-sectoral stakeholders across food systems as well as geographic convergence of multi-sectoral interventions. USAID could encourage programs to pair supply-side interventions with strategies to stimulate and sustain demand for nutritious foods. For example, linking subsidies and transfers to local food systems by prioritizing support for MSMEs will reduce food loss, ensure access and affordability, and promote nutritious food consumption.

2. Private Sector Approaches

Private sector engagement in efforts to increase the demand for nutritious foods is critical across businesses of all sizes and scope. There is an urgent need for the public sector to collaborate with businesses to invest in large-scale, continuous, and innovative efforts to improve the availability, accessibility, and safety of nutritious foods. This report focuses specifically on interventions targeting MSMEs. Opportunities to support MSMEs include developing incubator and accelerator programs, including co-investment grants and building capacity of local financial institutions that can help tailor and de-risk investments and innovations; building partnerships among smallholder farmers, retailers, and consumers; and sharing resources such as distribution hubs and locally sourced packaging. More evidence is needed on MSME interventions' ability to increase demand for nutritious food and bring promising innovations to the market faster, more safely, and in a cost-effective manner. There is opportunity for USAID to continue and expand on current programming to provide the networks, expertise, and technologies MSMEs need to develop a greater understanding of, and demand for, more diverse nutrient foods and to expand to new markets.

3. Public Sector Approaches

Strong country commitment and government leadership along with the active engagement of communities is required to encourage consumer demand for healthy diets. There is opportunity for USAID to advocate and support governments, civil society, and other stakeholders to leverage resources, promote coordinated actions, and advance country priorities around consumer demand for healthy diets. This includes supporting country policies and programs such as public procurement of nutritious foods (i.e., social protection platforms, school and institutional canteens/cafeterias), regulations on marketing and labelling foods and beverages high in saturated fats, trans fats, free sugars, or salt, development of national food-based dietary guidelines, and implementation of subsidies or taxes.

4. Research that Fills Evidence Gaps

As this review suggests, there are evidence gaps on the impact of interventions on healthy diets beyond micronutrient status and anthropometry. Investment is needed in research within public and private spheres, especially related to multi-component interventions such as cash-plus and multi-component social and behavior change programs; the combined effect of taxes and subsidies; leveraging the Nutrition Friendly Schools Initiative; and supply and demand interventions for the private sector like the promotion of food safety across markets and households. Importantly, to truly achieve progress in demand interventions for healthy and safe diets, there must be an emphasis on research that highlights the interconnected nature of supply and demand to drive meaningful and sustainable change. Specific knowledge gaps for current nutritious commodity supply chains, including traditional and Indigenous crops, are related to marketing and branding, packaging, and improving local dishes and street foods.

5. Data Ecosystems & Novel Metrics

Novel consumer-demand metrics and consolidated publicly available data sources are needed to better understand the context-specific facilitators and barriers to healthy and safe diets across population groups. In particular, this review found an absence of metrics used within intervention or evaluation studies on drivers of food choice (e.g., socio-cultural, personal food environments, material assets and resources, person-state drivers) and food choice behaviors (e.g., intra-personal factors such as knowledge, attitudes, practices, preferences, time use). There is also potential to develop enhanced globally standardized national poverty lines that better account for local costs and affordability of healthy diets. The development and use of novel metrics could improve intervention design and evaluation. Policy and program design would also benefit from increased collection, analysis, and aggregation of data across the public and private sectors to develop a more complete understanding of the dynamics and linkages at play throughout local food systems. Linking public and private sector data could significantly improve knowledge of what interventions work, in which settings, why, and how they could be scaled. Such data would also facilitate tracking of national progress on healthy diets.

6. Targeted Monitoring, Evaluation & Learning

This review identified the need for more real-world evidence on demand interventions for healthy and safe diets for all population groups in LMICs. This includes independent and rigorous monitoring and assessment of approaches to generate demand for healthy diets, such as food-based dietary guidelines, locally tailored consumer subsidies, and restricting marketing of foods and beverages high in saturated fats, trans fats, free sugars, or salt—all notable gaps in the available evidence. In addition to more research on the effects of these approaches, there is also a need for cost-effectiveness studies, implementation studies, implementation studies, and impact modeling to provide policymakers, funders, implementers, and other actors with information to guide strategic planning, financial projections, and priority setting to address healthy diets at scale.

7. Exploration of New Food Environments

New food environments, including the digital food environment[11], are shaping food acquisition and consumption in ways that extend beyond the physical food environment and have implications for diets and nutrition. The literature reviewed highlighted the potential for digital food environments to positively disrupt the food supply by making it more productive, cost efficient, transparent, and agile. However, there is little evidence on the impact of new digital food environments on the demand for nutritious foods in LMICs. Specifically, new frameworks are required to understand and encourage potential positive impacts of the digital food environment and harness its potential to help consumers make nutritious food choices. Experts consulted for this review noted that policymakers would also benefit from increased understanding of national digital ecosystems, the impact of youth exposure to digital advertisements for foods and beverages high in saturated fats, trans fats, free sugars, or salt, and best practices for promoting positive digital food environments.

[11] Digital food environments are the online settings through which flows of services and information that influence people's food and nutrition choices and behaviors are directed. They encompass a range of elements, including social media, digital health promotion interventions, digital food marketing and online food retail (World Health Organization. (2021). Digital Food Environments. https://www.who.int/europe/publications/i/item/WHO-EURO-2021-2755-42513-59052).

BACKGROUND & STUDY OBJECTIVES

Optimal nutrition is crucial for achieving USAID's broader mission of ending extreme poverty, promoting resilient and democratic societies, and enhancing national security and prosperity. The 2014-2025 Multi-Sectoral Nutrition Strategy and the U.S. government's Global Food Security Strategy 2022-2026 have put forward agendas to elevate nutrition, food security, and food safety.

Changing what people eat involves an understanding of how consumption is linked to agricultural production patterns (which typically respond to price incentives and predictable demand), food supplies, relative prices, trade policies, household purchasing power, social norms and cultural beliefs, and the changing climate. Interventions seeking to change the environments that cue, reinforce, and maintain diet-related behaviors have been described by Swinburn and others[12,13,14] as occurring at the macro- and meso-levels, as distinct from the micro- or individual-level.

In support of this, the overarching goal of this research is to assess the available evidence, identify evidence gaps, recommend areas for additional research, and use the existing evidence to develop a prioritized set of approaches and actions for USAID.

Toward this goal, this research brief aims to present current evidence on effective policies and interventions in Feed the Future and USAID Nutrition Priority geographies (which overlap except for Burkina Faso, and therefore are referred to in this brief, for simplicity, as Feed the Future countries; see Figure 1) to inform programming and national policy engagement.

More specifically, this research brief aims to understand the effectiveness of policies and interventions that:

1. Enhance the supply of nutritious and safe foods, including through off-farm activities by micro-, small- and medium-sized enterprises (MSMEs)[15] across supply chains and markets.
2. Support demand for healthier diets post-farmgate, including purchasing and consumption of healthy diets by individuals, households, private sector companies, and governments.

Study Approach

This report focuses on the demand side of the food system, and therefore it reviews policies and interventions at the storage and transportation, processing and packaging, distribution, retail and marketing, and consumption components of the food system, as shown in Figure ES1. The report analyzes the evidence on demand-side interventions at the population, market, community and household, and school levels, including:

- Fiscal policies, including taxes, subsidies, and transfers
- Regulatory policies, including dietary guidelines, marketing, labeling, and reformulation policies
- Incentives and access to finance for MSMEs
- Food loss and waste strategies
- Food safety education
- Integration of technologies and digitization

[12] Peeters, A. (2018). Obesity and the future of food policies that promote healthy diets. Nat. Rev. Endocrinol. 147 14, 430–437. https://doi.org/10.1038/s41574-018-0026-0

[13] Swinburn, B.A., Sacks, G., Hall, K.D., McPherson, K., Finegood, D.T., Moodie, M.L., Gortmaker, S.L., (2011). The global obesity pandemic: shaped by global drivers and local environments. Lancet. 378, 804–814. https://doi.org/10.1016/S0140-6736(11)60813-1

[14] von Philipsborn, P., Stratil, J.M., Burns, J., Busert, L.K., Pfadenhauer, L.M., Polus, S., Holzapfel, C., Hauner, H., Rehfuess, E. (2019). Environmental interventions to reduce the consumption of sugar-sweetened beverages and their effects on health. Cochrane database Syst. Rev. 6.

[15] According to World Bank, Micro, Small and Medium Enterprises (MSMEs) are defined as follows – micro enterprises: 1–9 employees; small: 10–49 employees; and medium: 50–249 employees. MSMEs form the backbone of food systems in most countries and can play a pivotal role in the improvement of nutrition and the achievement of healthy diets for all.

- Social and behavior change
- Home gardens and other agroecology community interventions
- Multicomponent interventions
- Food procurement and provision in schools
- Regulation of school food environments
- School-based nutrition education

The research focuses on critical questions including:

1. How can USAID work with communities, private sector, and national government stakeholders to enhance demand for safe and nutritious foods in ways that improve the diets of whole households, including women and children in particular?
2. What interventions can improve the affordability of healthy diets?
3. How can the progress and outcomes of demand-focused interventions be measured and evaluated?

To answer these questions, the researchers conducted a desk review of evidence on interventions to increase the demand for healthy diets in the available peer-reviewed and grey literature and facilitated a roundtable discussion for expert input. A description of the desk review approach can be found in Annex 1, and a summary of the take-aways from the roundtable discussion can be found in Annex 2. Importantly, this review includes current USAID programs and interventions only if formal evaluations of them were published and publicly available.

Both quantity and quality determinants of evidence for each area of intervention were analyzed in this evidence review. "Substantial," "some," and "limited" are used to describe the quantity of evidence (i.e., the number of studies in an area). The authors based the quality of evidence on the level of confidence in the certainty of effect of the intervention. "High confidence," "medium confidence," and "low confidence" in the certainty of effect are used to describe the quality of systematic reviews and primary studies that had minimal, some, or significant risks of bias, respectively.

This report leaned on several relevant conceptual frameworks to guide the selection and organization of evidence on private and public sector interventions to increase demand for healthy diets.[16]

First, the Nutrition-Sensitive Value Chain Framework,[17] developed by the International Fund for Agricultural Development, aims to shift from the traditional value-chain approach to understanding the nutrition needs of consumers by making value chains more nutrition-sensitive.

Second, the NOURISHING Framework, developed by the World Cancer Research Fund International, was designed to help policy makers, researchers, and organizations identify and promote key policy interventions required for a "comprehensive policy package" to promote healthy diets.[18] It helps researchers identify evidence for policy making, identify research gaps, and monitor and evaluate nutrition policies. More information about the NOURISHING Framework can be found in Annex 3.

Third, the USAID Bureau for Resilience and Food Security Food Systems Conceptual Framework[19] is adapted from the food systems conceptual framework developed by the High-Level Panel of Experts on Food Security and Nutrition in 2017. The REFS framework illustrates how key elements of the agency's work come together as part of the food system,

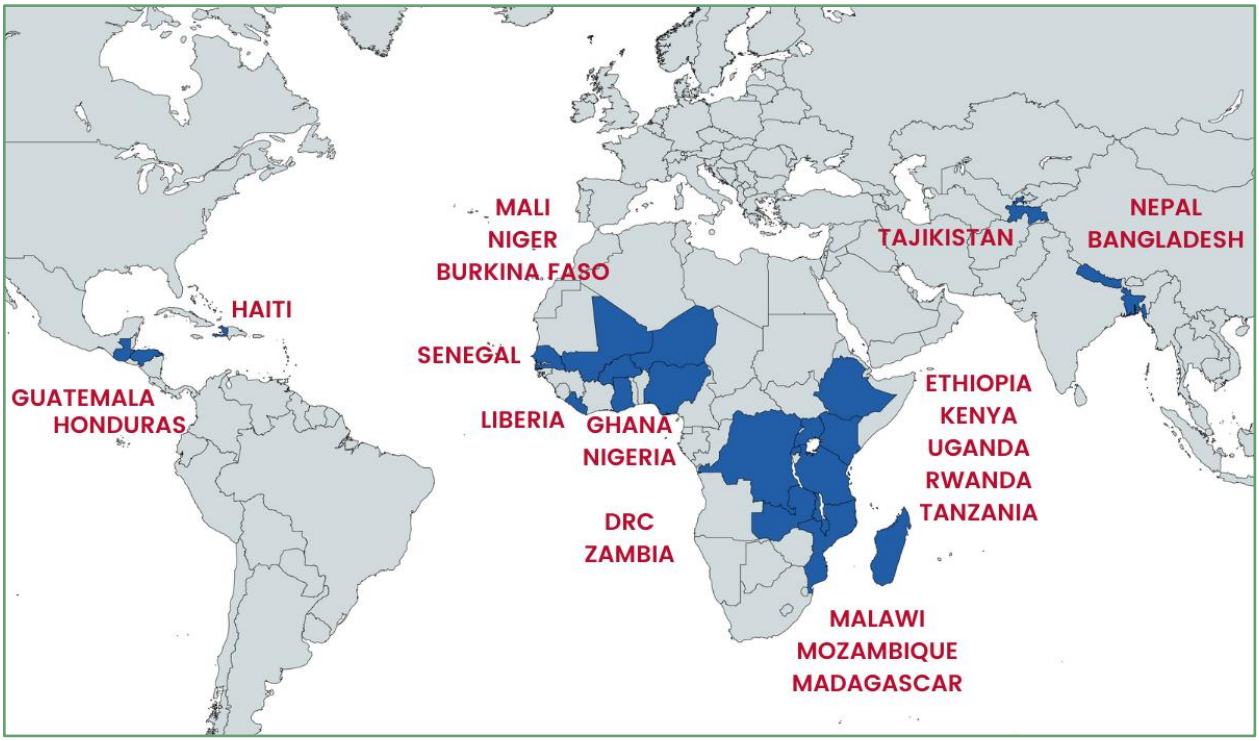
[16] Hawkes, C., Jewell, J., Allen, K. (2013). A food policy package for healthy diets and the prevention of obesity and diet-related non-communicable diseases: the NOURISHING framework. Obes Rev. 14 Suppl 2:159-68. doi: 10.1111/obr.12098. PMID: 24103073.
[17] IFAD. (2018). Nutrition-sensitive Value Chains Framework: Strategies and Entry Points. https://www.ifad.org/documents/38714170/41098185/NSVC+4-pager+ENG+WEB.pdf/d11b2326-c832-e85b-2474-3fdb8a374ac9?t=1554814198000
[18] Hawkes, C., Jewell, J., Allen, K. (2013). A food policy package for healthy diets and the prevention of obesity and diet-related non-communicable diseases: the NOURISHING framework. Obes Rev. 14 Suppl 2:159–168. doi: 10.1111/obr.12098.
[19] USAID. (2021). The Bureau for Resilience and Food Security (REFS) Food Systems Conceptual Framework. https://www.usaid.gov/feed-the-future/document/rfs-food-systems-conceptual-framework

specifically: agriculture-led economic growth, water, nutrition, and resilience.

Fourth, the High-Level Panel of Experts on Food Security and Nutrition Conceptual Framework of Food Systems for Diets and Nutrition[20] illustrates that food systems, their drivers, actors and elements do not exist in isolation but interact with one another and with other systems (such as health, energy and transportation systems). Importantly, it highlights the central role of the food environment in facilitating nutritious and sustainable consumer food choices and it emphasizes the role of diets as a core link between food systems and their nutrition and health outcomes.

The research prioritized evidence from Feed the Future countries, shown in Figure 1, for applicability. The research also identified important gaps in the evidence on demand-side interventions for improved nutrition.

FIGURE 1. MAP OF USAID NUTRITION PRIORITY & FEED THE FUTURE COUNTRIES



[20] High Level Panel of Experts on Food Security and Nutrition. (2017). Nutrition and Food Systems. https://openknowledge.fao.org/server/api/core/bitstreams/4ac1286e-eef3-4f1d-b5bd-d92f5d1ce738/content

RESULTS

The creation of an enabling and supportive environment for food and nutrition policies, programs, and interventions is a first step toward transforming food systems. LMICs are implementing evidence-based nutrition actions, both environmental and behavioral in nature, which vary in form, function, and level (population, market, community, household, and school). Generally, the primary goal of nutrition actions is to address food and nutrition insecurity, diet-related health outcomes, or to help consumers make optimal food choices. The context in which these interventions are implemented is important, including the myriad individual, social, and environmental influences on diets and nutrition. The following sections describe the current evidence on the effectiveness of such policies, programs and interventions across Feed the Future countries.

Population-Level Interventions

Fiscal Policies

Taxation

SUMMARY OF EVIDENCE

While there is strong evidence that SSB taxes reduce purchasing of taxed beverages in other LMICs, very little evaluation evidence on how excise taxes affect consumer demand for healthy diets exists for Feed the Future countries (low confidence), despite many Feed the Future countries applying national excise taxes on SSBs.

Taxation is a cost-effective tool to reduce consumption of packaged foods high in salt, sugar, or fat, with potential for considerable health and economic benefits.[21] According to the World Bank's Global Sugar Sweetened Beverage Tax Database, 132 jurisdictions (countries, regions, or districts) have implemented some type of tax on sugar-sweetened beverages (SSBs) (excise, import, sales, or value-added/goods and services). Of these, all Feed the Future countries, apart from Haiti and Malawi, currently apply national excise taxes on SSBs. Targeted excise taxes are considered the most effective instrument for health taxes because they can target less-healthy products and raise their prices relative to other goods and services. A tax that creates a price differential between SSBs and healthier alternatives can change demand for, and supply of, these products. While there is strong evidence that SSB taxes reduce purchasing of taxed beverages in other LMICs,[22,23] few studies exist for Feed the Future countries.

Importantly, data are not granular enough to allow for analyses of SSB taxes on specific population subgroups (i.e., urban versus rural, men versus women). Most studies, largely in

[21] Hattersley L, Mandeville KL. Global Coverage and Design of Sugar-Sweetened Beverage Taxes. *JAMA Netw Open.* 2023;6(3): e231412. doi:10.1001/jamanetworkopen.2023.1412

[22] Stacey, N., Edoka, I., Hofman, K., Swart, E. C., Popkin, B., & Ng, S. W. (2021). Changes in beverage purchases following the announcement and implementation of South Africa's Health Promotion Levy: an observational study. Lancet Planetary Health. 5(4), e200-e208. https://doi.org/10.1016/S2542-5196(20)30304-1

[23] Salgado Hernández, J.C., Ng, S.W. & Colchero, M.A. (2023). Changes in sugar-sweetened beverage purchases across the price distribution after the implementation of a tax in Mexico: a before-and-after analysis. BMC Public Health. 23, 265

high-income countries, provide aggregated results for the general population, with only a small subset of research reporting data for subpopulations, usually by socioeconomic status.[24] While taxation is not in the purview of USAID programming, the World Health Organization recently launched guidance[25] that suggests a strong recommendation to implement a policy to tax sugar-sweetened beverages and a conditional recommendation to implement a policy to tax foods that do not contribute to a healthy diet.

Food Subsidies and Transfers

SUMMARY OF EVIDENCE

There is a limited number of studies on food subsidies (low confidence), making it unclear whether changes are sustainable and whether savings might be used to purchase and consume foods and beverages high in saturated fats, trans fats, free sugars, or salt and, therefore, not translate into measurable nutrition benefits.

There is sufficient evidence (high confidence) on the effectiveness of unconditional and conditional cash transfers and in-kind transfers on dietary diversity in women and children across Feed the Future countries. There is also promising evidence on the effectiveness of cash-plus interventions on diets in a few Feed the Future countries.

Food subsidies and transfers (cash or in-kind) can be used to increase the demand for nutritious products that are under-consumed, such as fruits and vegetables. From a political economy perspective, food subsidies are often more appealing and, when effectively targeted, can mitigate concerns about the potentially regressive impact of a tax on foods and beverages high in saturated fats, trans fats, free sugars, or salt.[26] These subsidies can offer crucial, focused support to low socioeconomic groups, encouraging healthier eating habits. Food subsidies take various forms, such as vouchers or coupons that can be used to purchase healthier foods, or subsidies for the distribution of healthier foods. The effectiveness of programs to promote nutritional outcomes depends on the circumstances under which they are implemented.

Previous reviews have examined the effects of subsidy programs, across eight countries, on sales, food consumption, and health outcomes.[27,28] Of these, one program in South Africa implemented by a private health and life insurance company in 2009 provided a 25% discount on nutritious foods to 260,000 households.[29,30] Compared to those not receiving the subsidy, participants with the rebate were found to have an increase in daily fruit and vegetable consumption by 21%; an increase in the probability of having three or more servings of whole grain foods per day by

[24] Andreyeva, T., Marple, K., Marinello, S., Moore, T.E., Powell, LM. (2022). Outcomes Following Taxation of Sugar-Sweetened Beverages: A Systematic Review and Meta-analysis. JAMA Netw Open. 5(6), e2215276.
[25] World Health Organization. Fiscal policies to promote healthy diets: WHO guideline. Geneva: World Health Organization; 2024. License: CC BY-NC-SA 3.0 IGO.
[26] Hammaker, J., Anda, D., Kozakiewicz, T., Bachina, V., Berretta, M., Shisler, S., & Lane, C. (2022). Systematic review on fiscal policy interventions in nutrition. Frontiers in Nutrition, 9, 967494.
[27] Mansilla C, Herrera C.A., von Uexkull E. (2023). Food Subsidies to Promote Healthy Eating and Reduce Healthy Food Prices: A Rapid Literature Review. World Bank: Washington D.C.
[28] Alagiyawanna, A., Townsend, N., Mytton, O., Scarborough, P., Roberts, N., Rayner, M. (2015). Studying the consumption and health outcomes of fiscal interventions (taxes and subsidies) on food and beverages in countries of different income classifications; a systematic review. BMC Public Health.15, 887.
[29] An, R., Patel, D., Segal, D., Sturm, R. (2013). Eating Better for Less: A National Discount Program for Healthy Food Purchases in South Africa. American Journal of Health Behavior. 37(1), 56–61.
[30] An, R., and Sturm, R. (2017). A Cash-back Rebate Program for Healthy Food Purchases in South Africa: Selection and Program Effects in Self-reported Diet Patterns. American Journal of Health Behavior, 41(2), 152–162.

40%; and a decrease in the probability of regularly having foods high in sugar by 26%, foods high in salt by 22%, fried foods by 23%, processed meat by 15%, and fast food by 15%. Given the limited number of studies on subsidies, long-term studies are needed to investigate whether dietary changes are sustained (especially if the subsidy program ends) and whether savings might be used to purchase and consume foods and beverages high in saturated fats, trans fats, free sugars, or salt and not translate into measurable benefits.

In addition to subsidies, social safety net programs, as part of the broader social protection agenda, aim to address risks, vulnerability, and social exclusion. Across many LMICs, cash (conditional or unconditional) or in-kind transfers have been implemented, with varying results on diets, including food security, dietary diversity, and anthropometric outcomes. Of relevance to Feed the Future contexts, a recent USAID evidence review of direct monetary transfers and transfers plus[31] suggests these schemes are likely effective in improving dietary diversity.[32]

A Cochrane review by Durao and colleagues examined the effect of various transfers on household expenditure on food and dietary diversity. Their results suggest that unconditional cash transfers may increase dietary diversity (low confidence, 12,631 households, 890 children,10 Randomized Controlled Trials [RCTs], follow-up range 1-2 years) with 5 cluster RCTs [cRCTs] clearly favoring the intervention (from Bangladesh, Burkina Faso, Kenya, Malawi) and 5 cRCTs with unclear effects (Malawi, Zambia, Kenya, Lesotho, Mexico), but potentially favoring the unconditional cash transfer.

In Bangladesh, two studies (2 cRCTs implemented in the north and south of Bangladesh reported in the same paper[33]) reported positive effects. One reported an increase in the food consumption score by 6.84 points after two years (95% confidence interval [CI] 4.64 to 9.03), and the other study reported an increase in food consumption score by 2.62 points (95% CI 0.58 to 4.66) after two years.

In Burkina Faso, the odds of achieving Minimum Dietary Diversity (MDD) were approximately three-fold higher in the children from the intervention group (odds ratio [OR] 2.95, 95% CI 1.86 to 4.68; n = 322; P < 0.001) as compared to controls.[34] In Kenya, the mean increase in the dietary diversity score increased by 0.82 at two years in intervention households (1824 households; P < 0.01)[35], whereas in Malawi, a study reported an increase in the food diversity composite score by 2.4 points with the intervention compared to the control group (95% CI 1.22 to 3.58; 752 households).[36]

In addition, five cRCTs in Kenya, Malawi and Zambia reported on the proportion of household expenditure on food, with evidence being very uncertain about the effects of unconditional cash transfers (very low

[31] Direct Monetary Transfers are direct payments to individuals, households, or microenterprises with no strings attached. They can be delivered as a one-time lump sum payment or over a stream of several payments. Transfers Plus programs pair Direct Monetary Transfers with a relatively inexpensive and simple additional services or products. For example, a pregnant woman may be given a Direct Monetary Transfer and be enrolled in a monthly group nutrition coaching session (the plus component).
[32] USAID. (2023). Direct Monetary Transfers to Individuals, Households, Or Microenterprises for Development Outcomes: Evidence Synthesis & USAID Examples for Design Teams. https://www.usaid.gov/sites/default/files/2024-10/%28V2%29%20PUBLIC%20-%20Cash%20Transfer%20Knowledge%20Product%20%2810-08-2024%29.pdf

[33] Ahmed, A., Hoddinott, J., Roy, S. (2019). Food transfers, cash transfers, behavior change communication and child nutrition. Evidence from Bangladesh. IFPRI discussion paper 1868. [DOI: 10.2499/p15738coll2.133420]
[34] Tonguet-Papucci, A., Houngbe, F., Huybregts, L., Ait-Aissa, M., Altare, C., Kolsteren, P, et al. (2017). Unconditional seasonal cash transfer increases intake of high-nutritional-value foods in young Burkinabe children: results of 24-hour dietary recall surveys within the Moderate Acute Malnutrition Out (MAM'Out) randomized controlled trial. Journal of Nutrition. 147(7),1418-25.
[35] Asfaw, S., Davis, B., Dewbre, J., Handa, S., Winters, P. (2014). Cash transfer programme, productive activities and labour supply: evidence from randomized experiment in Kenya. Journal of Development Studies. 50(8),1172-96.
[36] Miller, C.M., Tsoka, M., Reichert K. (2011). The impact of the Social Cash Transfer Scheme on food security in Malawi. Food Policy. 36(2), 230-8.

confidence, 11,271 households (5 cRCTs)).[37, 38,39,40,41]

In comparison, conditional cash transfers provide cash to beneficiaries who participate in designated healthcare activities. While there are pros and cons of this scheme, the evidence indicates that conditional cash transfer programs can augment household food consumption and dietary diversity and increase participation in preventive health care.[42]

Of relevance to Feed the Future contexts, conditional cash transfer programs have been noted in Honduras, Burkina Faso, Ghana, Malawi, Tanzania, Uganda, and Bangladesh. Durao and colleagues noted that conditional cash transfers (moderate confidence, 3,937 households [2 RCTs]) and food transfers probably slightly improve dietary diversity (low confidence, 2,459 households [2 RCTs]).[43]

Other systematic reviews have corroborated findings on social protection schemes,[44] including that by Olney and colleagues, which found positive effects on dietary diversity in women (7 of 9 studies, both cash and in-kind transfers), whereas only 7 of 18 studies found increases in dietary diversity in children.[45]

While cash and in-kind transfers may produce similar effects on diets for the most vulnerable, there are divergent views on the intended and unintended effects (both positive and negative) of adoption of each transfer modality. For example, those in favor of cash transfers describe the positive effects on food choice and empowerment and the ease of distribution. However, the pitfalls of cash transfers include food price volatility, coupled with infrequent updates to transfer values, as well as potential for non-food expenditures, if not restricted. In-kind transfers, on the other hand, are viewed as paternalistic and create significant logistical burden. However, the rationale for their use has leaned on encouraging consumption of healthier foods, and their corresponding cash value helps to shift demand through an income effect.[46] Given that no single scheme is likely to be effective on its own, there is a need for pilot studies to test combinations tailored to different consumer contexts, including low-income urban, rural poor, and peri-urban scenarios. Furthermore, the effectiveness of programs varies substantially by program type and design features—such as targeting households or specific individuals, types of foods provided, and integrated interventions with social and behavior change—these factors, along with other contextual factors, must be considered prior to implementation.

Additionally, reviews of cash-plus programs, which aim to combine cash transfers with other interventions or services (e.g., social and behavior change, psychosocial support, or cross-sectoral linkages) to improve development outcomes across multiple Sustainable Development Goals (SDGs), have seen positive effects. Little and colleagues noted that while few studies measured and reported on dietary outcomes as opposed to anthropometric outcomes, programs in

[37] Asfaw, S., Davis, B., Dewbre, J., Handa, S., Winters P. (2014). Cash transfer programme, productive activities and labour supply: evidence from randomized experiment in Kenya. Journal of Development Studies. 50(8),1172-96.
[38] Brugh, K., Angeles, G., Mvula, P., Tsoka, M., Handa, S. (2018). Impacts of the Malawi social cash transfer program on household food and nutrition security. Food Policy. 76,19-32.
[39] Hjelm, L., Handa, S., de Hoop, J., Palermo, T. (2017). Poverty and perceived stress: evidence from two unconditional cash transfer programs in Zambia. Social Science Medicine.177,110-17.
[40] Merttens, F., Hurrell, A., Marzi, M., Attah, R., Farhat, M., Kardan A, et al. (2013). Kenya Hunger Safety Net Programme; monitoring and evaluation component: impact evaluation final report: 2009 to 2012. Oxford Policy Management.
[41] Miller, C.M., Tsoka, M., Reichert, K. (2011). The impact of the Social Cash Transfer Scheme on food security in Malawi. Food Policy. 36(2), 230-8.
[42] Alderman, H. (2016). Leveraging Social Protection Programs for Improved Nutrition: Summary of Evidence Prepared for the Global Forum on Nutrition Sensitive Social Protection Programs, 2015. World Bank, Washington, DC.
[43] Durao, S., Visser, M.E., Ramokolo, V., Oliveira, J.M., Schmidt, B.M., Balakrishna, Y., Brand, A., Kristjansson, E., Schoonees, A. (2020). Community-level interventions for improving access to food in low- and middle-income countries. Cochrane Database Syst Rev. 7(7), CD011504.
[44] Bastagli, F., Hagen-Zanker, J., Harman, L., Barca, V., Sturge, G., and Schmidt, T. (2019). The impact of cash transfers: a review of the evidence from low-and middle-income countries. Journal of Social Policy. 48(3), 569-594.
[45] Olney, D.K., Gelli, A., Kumar, N., Alderman, H., Go, A., Raza, A. (2022). Social assistance programme impacts on women's and children's diets and nutritional status. Matern Child Nutr. 18(4), e13378.
[46] Lavers, T (ed.). (2022). The Politics of Distributing Social Transfers. Oxford Academic. https://doi.org/10.1093/oso/9780192862525.001.0001

Bangladesh, Ethiopia, Kenya, and Niger have noted effectiveness of cash-plus program on improving diets.[47] There is a need for more research on the cost-effectiveness of cash-plus programs, how behavior change linked to cash transfers or vouchers influences food choices, and the long-term impacts.

Regulatory Policies

SUMMARY OF EVIDENCE

Regulatory policies such as food-based dietary guidelines, food reformulation policies, and marketing and labeling policies are limited (low confidence) in terms of adoption, implementation, and effectiveness on consumer demand for healthy diets across Feed the Future countries. Therefore, there is insufficient evidence on the effectiveness of these measures.

The adoption, strengthening, and enforcement of such regulatory policies as food-based dietary guidelines, marketing and labeling policies, and fortification and reformulation policies can protect, promote, and support healthy diets. Importantly, developing and implementing regulatory frameworks related to food and nutrition often requires the engagement of a broad range of government agencies.

Food-Based Dietary Guidelines

National food-based dietary guidelines provide practical advice on specific food groups, nutrients, and diets tailored to country contexts. These guidelines assist consumers in making nutritious food choices and serve as a foundation for public education, labeling, advertising policies, and food production priorities. Currently, more than 100 countries have developed such guidelines. According to the Food and Agriculture Organization (FAO), of the 23 Feed the Future countries, only nine countries have national dietary guidelines (Bangladesh, Nepal, Kenya, Ghana, Nigeria, Ethiopia, Zambia, Guatemala, and Honduras). However, many of these country guidelines do not fully align with the WHO's standards of a healthy diet[48], and evidence on adherence of population groups to food-based dietary guidelines has been limited. There is also a need to assess how these guidelines have been integrated into social and behavior change programs, nutrition education, and social marketing actions.

Marketing Policies

Comprehensive action by governments to reduce the exposure to and impact of the promotion of foods and beverages high in saturated fats, trans fats, free sugars, or salt, directed at children and adolescents, is required in both physical and digital food environments. Globally, countries are actively implementing food marketing policies on foods high in saturated fats, trans-fatty acids, free sugars, or salt in response to the World Health Assembly Resolution 63.14 drafted in 2010 and recent WHO guidelines.[49] Evidence on effectiveness of restricting food-marketing policies on exposure, purchasing, and diets is informing these guidelines and has mainly been reported from high-income countries, except for one study in Mexico.[50]

The harmful marketing of breast milk substitutes directly to consumers via digital and

[47] Little, Madison T., et al., "Effectiveness of cash-plus programmes on early childhood outcomes compared to cash transfers alone: A systematic review and meta-analysis in low-and middle-income countries." PLoS Medicine 18.9 (2021): e1003698

[48] FAO and WHO. (2024). What are healthy diets? Joint statement by the Food and Agriculture Organization of the United Nations and the World Health Organization. https://doi.org/10.4060/cd2223en.

[49] WHO. (2023). Policies to protect children from the harmful impact of food marketing: WHO guideline. License: CC BY-NC-SA 3.0 IGO.

[50] Boyland, E., McGale, L., Maden, M., Hounsome, J., Boland, A., Jones, A. (2022). Systematic review of the effect of policies to restrict the marketing of foods and non-alcoholic beverages to which children are exposed. Obes Rev. 23(8), e13447

traditional forms of media, and indirectly via incentives, free supplies, and promotions to and through health workers and facilities, retailers, and policy makers is also a critical issue that undermines breastfeeding practices and public health initiatives aimed at promoting optimal infant nutrition. The International Baby Food Action Network, UNICEF, and WHO continuously monitor the adoption or implementation of regulations against inappropriate marketing of breast milk substitutes.

As of March 2024, nine Feed the Future countries (Bangladesh, Burkina Faso, Ethiopia, Ghana, Kenya, Mozambique, Nigeria, Tanzania, and Uganda) have enacted legislation or adopted regulations, decrees, or other legally binding measures encompassing a significant set of provisions of the International Code of Marketing of Breast Milk Substitutes. In addition to this, seven countries are moderately aligned with the code (Guatemala, Madagascar, Mali, Malawi, Nepal, Tajikistan, and Zambia), and some provisions of the code are included in four countries (Honduras, Niger, Rwanda, and Senegal).[51]

Food Labeling Policies

Facilitating demand for nutritious and safe foods means we must also tackle the growing rise of ultra-processed foods while promoting nutritious, safe, and minimally processed foods. Food labeling policies are implemented to enable consumers to make informed choices regarding the safety and nutrition of their foods. These include mandatory or voluntary front-of-pack labeling (FOPL), traffic lights, warning labels, scores or ratings, and guidelines for daily allowance that are easy to understand indicating healthiness of food products and fit for context. FOPL regulations have spread across LMICs as a cost-effective intervention to provide clear and simple information to the population, quickly indicating when a packaged product is high in nutrients of concern and/or contains food additives that can be harmful to health. FOPL is applicable to packaged food and beverage products that are typically ultra-processed.

It is important to note that there are many FOPL models around the world aimed at complementing the nutritional facts table and list of ingredients to provide information to consumers at a glance. In high-income countries, three reviews assessed the effect of labeling interventions (i.e., traffic light, nutrition labels, menu labels) on SSB or non-alcoholic drink purchases in real-world settings.[52,53,54]

Compared with no FOPL, the presence of any FOPL likely improved consumer understanding of the nutritional content or quality of foods and the healthfulness of food choices and food purchases (all with moderate certainty of evidence for RCTs). Meta-analyses showed that the presence of FOPL led to a significant effect of small size on reducing choice of foods and beverages high in saturated fats, trans fats, free sugars, or salt and on improving the healthfulness of food purchases, compared with when no FOPL was present.[55] Currently no Feed the Future country has implemented FOPL; however, two countries have implemented front-of-pack logos (Zambia and Nigeria), and five countries appear to be developing mandatory food labeling policies (Ethiopia, Ghana, Kenya, Tanzania, and Uganda).

In 2020, the government of Zambia created the Good Food Logo, in collaboration with the SUN Business Network and with support from

[51] WHO and UNICEF. (2024). Marketing of breast-milk substitutes: national implementation of the International Code, status report 2024. License: CC BY-NC-SA 3.0 IGO

[52] von Philipsborn, P., Stratil, J.M., Burns, J., Busert, L.K., Pfadenhauer, L.M., Polus, S., Holzapfel, C., Hauner, H., Rehfuess, E. (2019). Environmental interventions to reduce the consumption of sugar-sweetened beverages and their effects on health. Cochrane Database of Systematic Reviews. Issue 6. Art. No.: CD012292. DOI: 10.1002/14651858.CD012292.pub2.

[53] Kelly, B., Ng, S.H., Carrad, A., Pettigrew, S. (2024). The Potential Effectiveness of Front-of-Pack Nutrition Labeling for Improving Population Diets. Annu Rev Nutr. 44, 405-440. doi: 10.1146/annurev-nutr-011224-030917. Epub ahead of print. PMID: 38857543.Xx

[54] Crockett, R.A., King, S.E., Marteau, T.M., Prevost, A.T., Bignardi, G., Roberts, N.W., Stubbs, B., Hollands, G.J., Jebb, S.A. (2018). Nutritional labeling for healthier food or non-alcoholic drink purchasing and consumption. Cochrane Database Syst Rev. 2(2), CD009315

[55] Kelly, B., Ng, S.H., Carrad, A., Pettigrew, S. (2024). The Potential Effectiveness of Front-of-Pack Nutrition Labeling for Improving Population Diets. Annu Rev Nutr. 44, 405-440. doi: 10.1146/annurev-nutr-011224-030917. Epub ahead of print. PMID: 38857543.Xx

the World Food Programme. The Good Food Logo has been used on products that meet a set of nutrition criteria based on international dietary guidelines from WHO.[56] Likewise, in Nigeria, there have been efforts led by the Nigerian Heart Foundation to initiate a voluntary Heart Tick label on pre-packaged foods to identify heart-healthy foods. In both countries, there have yet to be formal evaluations of impacts on consumer purchasing or dietary intake, as well as studies on the correct use and compliance of labels and logos by food companies.

Food Reformulation Policies

Food reformulation policies can be a means of improving diet quality and reducing diet-related diseases. Most reformulation policies launched thus far are of single-nutrient focus (e.g., sodium or trans-fats), which often ignores the complete nutrient profile of food products. According to WHO's global database on the Implementation of Food and Nutrition Action (GIFNA), 45 countries have a policy commitment to reformulate food to reduce the content of fats, sugars and salt, including Guatemala, Honduras, Kenya, Mozambique, Rwanda, Senegal, and Tajikistan.

Additionally, several countries have mandatory or voluntary reformulation policies to limit fats (trans-fats, saturated, or total), salt, and sugar. Of note, Bangladesh implemented a mandatory reformulation policy for trans-fat in 2022. Evidence on how these policies have translated into action is limited.

[56] SUN Business Network. Zambia Good Food Logo. https://sunbusinessnetwork.org/stories/zambias-good-food-logo-a-badge-for-better-nutrition/

Food Supply & Market-Level Interventions

While there are many actors in the food supply chain, one set of actors that can and should be heavily leveraged is MSMEs. As demand for affordable nutritious food increases and food insecurity rises globally, MSMEs have a growing proportion of the economy and an increasingly critical role in the private sector of LMICs, especially in the food and agricultural industries.[57,58,59] It is estimated that approximately 65-85% of food consumed in Africa and South Asia is now procured, processed, and sold (wholesale and retail) by MSMEs[60,61]. For example, in Nigeria, MSMEs make up 99% of the economy and contribute 50% to the nation's GDP, and in Ghana, they make up 90% of the economy and contribute 70% to the GDP.[62] In addition, in sub-Saharan Africa, more than 85% of fruit and vegetables by volume and about 80% of animal source foods such as meat and dairy are produced by MSMEs.[63] In Ethiopia, MSME meat processors are responsible for 95% of meat processing.[64]

In LMICs, MSMEs are highly active in the middle stages of the food supply chain, including food production, procurement, storage, logistics, transportation, trading, and distribution; however, they have been traditionally overlooked by policymakers and governments. As such, MSMEs are often referred to as the "hidden middle". It is important to note that while MSMEs now represent a large portion of the private sector, the vast majority are micro-enterprises, often small and informal, headed by very few personnel, and lacking resources, skills, and infrastructure compared to their larger competitors and counterparts. For example, in Guatemala, MSMEs make up more than 99% of the 926,000 registered enterprises in the country, and, of these, 95% are micro-enterprises.

The availability of food products is essential to influence consumer choice and consumption, and thus interventions and innovations focused on MSMEs have the potential to transform food systems and ensure more safe, high-quality, and affordable nutritious food products reach all consumers.[65]

[57] Agridius Foundation. (2023). SMEs in Food Systems: A Framework for Engagement, Guatemala Country Study. https://prd-control-multisite.maneraconsult.com/media/xgyhfjko/guatemala-country-study-vpublic.pdf

[58] Vos, R and Cattaneo, A. (2021). Poverty reduction through the development of inclusive food value chains. Journal of Integrative Agriculture. 20(4). 964-978.

[59] Maredia, M. K., Porter, M., Nakasone, E., Ortega, D. L., & Caputo, V. (2024). Does increasing the availability of a nutritious food produced by a small- and medium-sized enterprise increase its consumption? Evidence from a field experiment in Kenya. Applied Economic Perspectives and Policy. 46(2), 414-434.

[60] Reardon, T., Liverpool-Tasie, L. S. O., & Minten, B. (2021). Quiet Revolution by SMEs in the midstream of value chains in developing regions: wholesale markets, wholesalers, logistics, and processing. Food Security, 13(6), 1577-1594.

[61] Africa Agriculture Status Report. (2024). Accelerating the Private Sector for Food Systems Transformation in Africa. https://agra.org/wp-content/uploads/2024/09/AASR2024-0309202401.pdf

[62] ACCION. (2023). Strategies to Optimize MSME-centered supply chain finance solutions. A case study of Ghana, Ethiopia and Nigeria. https://www.accion.org/wp-content/uploads/2023/10/Africa_Supply_Chain_Finance_paper_EN_FINAL_071922.pdf.

[63] Herrero, M., Thornton, P.K., Power, B., Bogard, J.R., Remans, R., Fritz, S., Gerber, J.S., Nelson, G., See, L., Waha, K., Watson, R.A., West, P.C., Samberg, L.H., van de Steeg, J., Stephenson, E., van Wijk, M., Havlik, P. (2017). Farming and the geography of nutrient production for human use: A transdisciplinary analysis. Lancet Planetary Health. 1(1), e33–e42.

[64] Soethoudt, J. M., Riet, J. van de, Sertse, Y. & Groot, J. J. (2013). Business Opportunities: Food Processing in Ethiopia. Wageningen UR – Food & Biobased Research. https://research.wur.nl/en/publications/business-opportunities-food-processing-in-ethiopia

[65] Grude, A., Eckert, E., Otieno, J., Mulaisho, A., Kariuki, L., & McCurdy, C. (2024). USAID Learning Brief: Partnering with Food Processors to Tackle Sourcing Challenges and Strengthen Farmers' Livelihoods. https://agrilinks.org/sites/default/files/media/file/AINFP%20SHF%20Learning%20Brief.pdf

Financial Access & Incentives for MSMEs

SUMMARY OF EVIDENCE

There is some evidence (medium confidence) that certain business models such as cooperatives and public-private partnerships, especially MSMEs that target low-income consumers, can support nutrition-related actions and initiatives. They can increase market access for smallholders, enhance processing and distribution networks, and provide investment for product and technological development and innovation, thereby making MSMEs more productive and efficient. However, at present, there are a limited number of studies (low confidence) in Feed the Future contexts on how financial support for MSMEs improves diets of target populations.

One of the most reported barriers by MSMEs is lack of financial capital.[66] MSMEs tend to lack formalized land titles, tenure, or other assets that can be used as collateral for loans from formal lending institutions like banks. MSMEs also tend to have weak administrative, organizational, and logistical capacities and staffing issues that make formal investors unwilling to take on such high risks (e.g., climate change and economic shocks). And many smallholder farmers and other micro-enterprises live in poverty, so the capacity to financially input back into their own businesses and farms and/or repay high interest loans is severely limited.[67,68,69]

Cooperatives are a business model that can mitigate some of these challenges. Cooperatives increase food productivity through better market access and greater distribution capacity, for example by reducing transportation costs as members can share transport access to multiple markets. Cooperatives also allow the group to have better negotiation power with other players in the value chain and make MSMEs more attractive to formal financial providers.

Members can pool resources and access formal credit more easily, which in turn can be invested to ensure their products are processed efficiently and can safely reach the consumer at lower prices.[70] Additionally, cooperatives often offer educational and technical support to their members, enhancing their ability to adopt improved practices and technologies. This support not only boosts productivity but also ensures members produce, process, and distribute high-quality safe and nutritious foods.

For example, Copiasuro S.L. is a successful farmer-owned cooperative of beekeepers in San Marcos, Guatemala that aggregates, processes, and markets locally produced natural, certified-organic honey.[71] Working together allowed them to negotiate and access price premiums and to share knowledge, practices, and skills training. Likewise, the USAID Cooperative

[66] Nordhagen, S., Igbeka, U., Rowlands, H., Shine, R.S., Heneghan, E., Tench, J. (2021). COVID-19 and small enterprises in the food supply chain: Early impacts and implications for longer-term food system resilience in low- and middle-income countries. World Dev. 141,105405.
[67] Danse, M., Klerkx, L., Reintjes, J., Rabbinge, R., & Leeuwis, C. (2020). Unravelling inclusive business models for achieving food and nutrition security in BOP markets. Global Food Security. 24, 100354.
[68] Henson, S., and Agnew, J. (2021). Are market-based solutions a viable strategy for addressing micronutrient deficiency? Lessons from case studies in sub-Saharan Africa and South Asia. Development Policy Review 39. https://onlinelibrary.wiley.com/doi/abs/10.1111/dpr.12492
[69] Gillespie, S., Haddad, L., Mannar, V., Menon, P., Nisbett, N. (2013). Maternal and Child Nutrition Study Group. The politics of reducing malnutrition: building commitment and accelerating progress. Lancet. 382(9891), 552-69.
[70] Aseto, J.O.; Anggraeni, K.; Melgar, M.I.M.; Ballón-Ossio, A.; Sander, L.E.; Grossi, F.; Ojwang, W.; Gathogo, E.; Njiru, C.; Orwa, N. (2022). Promotion and Uptake of Sustainable Consumption and Production (SCP) Practices among Kenyan MSMEs: Key Learnings. Sustainability. 14, 3207.
[71] Agridius Foundation. (2023). SMEs in Food Systems: A Framework for Engagement, Guatemala Country Study. https://prd-control-multisite.maneraconsult.com/media/xgyhfjko/guatemala-country-study-vpublic.pdf

Development Activity 4 (CD4) was a five-year activity implemented by Venture37 in Malawi and Rwanda to build inclusive and resilient cooperative structures. Unlocking business opportunities for women and young people through financial literacy was a key outcome.[72]

A study by Maredia et al. investigated several approaches to supporting MSMEs, one of which included an impact accelerator that provided financial and technical assistance to food-producing SMEs in Kenya through a project called the Marketplace for Nutritious Foods (MNF). The technical assistance aimed to improve MSME's management practices, production capacities, food safety practices, and marketing strategies to make production more efficient and to better target consumer markets. Grants were given to finance equipment, infrastructure, and other operational costs. Efforts aimed to increase the availability, affordability, and desirability of nutritious foods sold in markets. The study findings showed that the impact accelerator was successful at helping MSMEs launch new products into the consumer market and that MSMEs overall found the grants very helpful in investing in infrastructure and product development.[73] The technical assistance was also crucial in improving MSME knowledge, awareness, and skill sets in running their businesses.[74,75]

It is important to highlight, however, that the study's impact on consumer consumption and diet quality was limited. Although the intervention introduced a safe, nutritious product—peanut butter—into low-income markets, it did not significantly shift the market supply or demand for peanut butter. Peanut butter purchases did not increase, and the consumption of related products such as other nut butters and spreads like jam or margarine was unchanged. The authors suggest that the introduction of one or few nutritious products into the markets is not enough to affect diet quality as needed.

To achieve an actual change in diet quality and consumption will require a multifaceted approach of policies, programs, and interventions targeting different types of foods that contribute to consumers' context-specific food baskets.[76]

Other key challenges faced by MSMEs include lack of infrastructure, such as roads, electricity, and water management; limited land or land tenure issues; and lack of access to expertise and training, information and communications, and innovative technology that can add value to their productivity. Addressing these basic needs can have a major impact on increasing productivity and minimizing food waste and/or loss during postharvest and processing. The result can be greater volumes of safe and nutritious foods that are more accessible and affordable at the consumer level.

One example of an innovative intervention that addresses some of these key challenges is implemented by Tanga Fresh Ltd. in Tanzania. Tanga Fresh Ltd. operates and coordinates a dairy value chain of milk collection, processing, and marketing.[77] They not only provided cattle to farmers and financial credit to build and expand their productivity, but also created innovative hubs called Milk Collection Centers. These centers serve as an efficient one-stop-

[72] USAID and Land O'Lakes Venture 37. (2023) USAID Cooperative Development Activity in Malawi and Rwanda. https://www.landolakesventure37.org/insights-hub/impact-reports-cooperative-development-activity-4-malawi-and-rwanda

[73] Maredia, M.K., Nakasone, E., Porter, M., Nordhagen, S., Caputo, V., Djimeu, E.W., Jones, A.D., Mbuya, M.N., Ortega, D.L., Toure, D., Tschirley, D. (2024). Using Novel Multimethod Evaluation Approaches to Understand Complex Food System Interventions: Insights from a Supply Chain Intervention Intended to Improve Nutrition. Current Developments in Nutrition. 8(6),103776.

[74] Neufeld, L.M., Nordhagen, S., Leroy, J.L., Aberman, N.L., Barnett, I., Djimeu Wouabe, E., Webb Girard, A., Gonzalez, W., Levin, C.E., Mbuya, M.N., Nakasone, E., Nyhus Dhillon, C., Prescott, D., Smith, M., Tschirley, D. (2024). Food Systems Interventions for Nutrition: Lessons from 6 Program Evaluations in Africa and South Asia. Journal of Nutrition. 154(6),1727-1738

[75] Maredia, M.K., Nakasone, E., Porter, M., Nordhagen, S., Caputo, V., Djimeu, E.W., Jones, A.D., Mbuya, M.N., Ortega, D.L., Toure, D., Tschirley, D. (2024). Using Novel Multimethod Evaluation Approaches to Understand Complex Food System Interventions: Insights from a Supply Chain Intervention Intended to Improve Nutrition. Current Developments in Nutrition. 8(6),103776.

[76] Maredia, M.K., Nakasone, E., Porter, M., Nordhagen, S., Caputo, V., Djimeu, E.W., Jones, A.D., Mbuya, M.N., Ortega, D.L., Toure, D., Tschirley, D. (2024). Using Novel Multimethod Evaluation Approaches to Understand Complex Food System Interventions: Insights from a Supply Chain Intervention Intended to Improve Nutrition. Current Developments in Nutrition. 8(6),103776.

[77] Danse, M., Klerkx, L., Reintjes, J., Rabbinge, R., & Leeuwis, C. (2020). Unravelling inclusive business models for achieving food and nutrition security in BOP markets. Global Food Security. 24, 100354.

shop where farmers can access information and training, animal feed, and medicine. This ensures farmers have the knowledge and resources they need to be as profitable and productive as possible.

Access to markets and distribution networks is another key area of opportunity for intervention and innovation. This can be achieved by leveraging partnerships with existing companies, for profit and non-profit organizations that either have access to the local and international markets already, and/or have more resources to build more efficient and thus less costly distribution.

For example, ASFRASA is a Guatemalan organization that takes unprocessed beans grown locally in smallholder farms and imported grains (e.g., lentils, rice, oats), and processes and packages these crops for wholesale in the local market.[78] This business model is an example of stable and guaranteed sourcing partnerships that not only link farmers to the market but also provide them with better and more competitive pricing and more stable offtakes. This model removes the middle stages of processing, packaging, distributing, and marketing, which can be costly and logistically prohibitive for many smallholder farmers.

Another example is Dadtco, a social enterprise in Nigeria that partnered with the International Fertilizer Development Center and the Dutch Ministry of Foreign Affairs to purchase semi-processed cassava products from smallholder farmers and sell them in local and international markets.[79] This enterprise provides the equipment and training for these farmers to process their raw cassava crop into a semi-processed form that is not only more marketable but also yields higher margins.

This example highlights the value and demand for innovation in value chains to help MSMEs become more profitable. Unfortunately, innovation like this typically requires financial capital and human resources that mostly only larger partners, companies, or organizations can afford.

This type of partnership and business model can also work on a large scale. Sylva Food Solutions, a highly successful organization in Zambia, has partnered with more than 25,000 smallholders who locally produce and process traditional food in response to the growing presence of Western-style foods in the country as a support to local farmers. Sylva Food Solutions has created a guaranteed market for these smallholder farmers and has connected them to players in the private sector, supply chain, and government, while also providing secure financial resources for the farmers to continue growing locally produced, traditional food that is accessible to all consumers in the country.[80]

Another type of partnership that may help MSMEs transform food systems and address growing food insecurity is public-private partnerships (PPP). MSMEs are the businesses that best target the base of the pyramid (BOP), or the lowest-income consumers, a massive market that global and multinational companies seek to access. Although there is concern about the motives for the private sector entering the public space of health and nutrition, PPPs can mitigate the challenges that MSMEs face in the dynamic food supply chain while also achieving their goals and objectives of increasing their markets. As such, there is an increasing push for greater engagement and responsibility of the private sector in nutrition-related actions and initiatives.[81]

The private sector can help transform value chains by ensuring sourcing schemes with local producers and traders and can act as a guaranteed retailer or enhance distribution and

[78] Agridius Foundation. (2023). SMEs in Food Systems: A Framework for Engagement, Guatemala Country Study. https://prd-control-multisite.maneraconsult.com/media/xgyhfjko/guatemala-country-study-vpublic.pdf

[79] Danse, M., Klerkx, L., Reintjes, J., Rabbinge, R., & Leeuwis, C. (2020). Unravelling inclusive business models for achieving food and nutrition security in BOP markets. Global Food Security. 24, 100354.

[80] Global Alliance for the Future of Food. (2022). Mobilizing Money & Movements: Creative Finance for Food Systems Transformation. https://futureoffood.org/insights/mobilizing-money-and-movements/

[81] Hoddinott, J., Gillespie, S., and Yosef, S. (2015). Public-Private Partnerships and the Reduction of Undernutrition in Developing Countries. IFPRI Discussion Paper 1487. https://ssrn.com/abstract=2741274

market access for MSMEs. The private sector can also help with promoting products or technological innovations that expand existing nutritious food products for consumers.

The SUN Business Network (SBN) is a global private sector platform that supports MSMEs in LMICs, assessing their needs, identifying areas of support (e.g., technical, financial, and other support services), and advocating for an enabling environment in their respective countries. SBN works in multiple countries in Asia and Africa, including Zambia, Kenya, Nigeria, and Bangladesh. They help broker partnerships and collaborations between the private and public sectors, governments, and other actors in the food supply chain to increase the accessibility of nutritious food for consumers. SBN is a network of stakeholders that has the resources to invest in MSMEs and the food system.

Partnerships with and investments from the private sector can also help vertically integrate smallholder producers and MSMEs into national or global supply chains, unlocking access to resources and markets.

With investment from the International Finance Corporation, Pearl Dairy, the second largest milk processor in Uganda, has expanded its network of milk collection centers and suppliers, especially in remote rural areas, and has improved its processing and cold storage infrastructure. As a result, milk production, safety, and quality have increased, and local milk consumption within remote rural communities has increased.[82]

In Bangladesh, local coastal fishing communities are supported by a FAO/UNDP project that developed and disseminated low-cost solar technology to dry fish. This innovative solar fish dryer not only ensured quality and consistency in the product, but also reduced postharvest losses through improved handling and better food safety.[83]

PPPs can also be impactful by co-creating new nutritious food products with local players in the value chain like fortified and/or reformulated food products. For example, Shokti+ is a fortified probiotic yogurt produced and distributed in Bangladesh in a partnership between Grameen Bank, Danone, Global Alliance for Improved Nutrition, local dairy farmers, and other value chain players that provide the micronutrients and packaging, transportation, and marketing services.[84] This yogurt was formulated to provide essential micronutrients that are missing in the diets of undernourished children in Bangladesh. Not only is the product fortified to provide a more nutritious option for consumers, but it also provides opportunities for farmers and formal employment for rural women who distribute the product to local and harder-to-reach communities. To keep affordability reasonable amid rising production costs, the product was reformulated to be shelf-stable at an ambient temperature, negating the need for chilled distribution and storage. This reformulated product also used lower-cost packaging that helped to keep prices low, allowing lower-income consumers to access and afford it. Importantly, a randomized double blinded controlled trial utilized this fortified yogurt to test its efficacy on micronutrient status and growth in school-aged children over a one-year period in Bangladesh.[85] While dietary outcomes were not assessed, the study authors noted an improvement in hemoglobin (mean difference: 1.5; 95% CI: 0.4-2.5; p = 0.006) as compared to non-fortified group. This type of innovation and reformulation was possible due to resources

[82] PATH et al,. (2019). Where Business and Nutrition Meet: Review of approaches and evidence on private sector engagement in nutrition. MQSUN+ Report. https://mqsunplus.path.org/wp-content/uploads/2018/09/MQSUN_Report-Where-Business-and-Nutrition-Meet_15June2018_FINAL.pdf

[83] FAO. (2014). Policies and strategies for the development of small and medium-scale food processing enterprises in Bangladesh. Policy measures for micro, small and medium food processing enterprises in the Asian region. https://openknowledge.fao.org/server/api/core/bitstreams/7c24d841-c82c-48ea-907e-3615af3fa135/content

[84] Henson, S., and Agnew, J. (2021). Are market-based solutions a viable strategy for addressing micronutrient deficiency? Lessons from case studies in sub-Saharan Africa and South Asia. Development Policy Review 39. https://onlinelibrary.wiley.com/doi/abs/10.1111/dpr.12492

[85] Sazawal, S., Habib, A., Dhingra, U., Dutta, A., Dhingra, P., Sarkar, A., Deb, S., Alam, J., Husna, A., Black, R.E. (2013). Impact of micronutrient fortification of yoghurt on micronutrient status markers and growth – a randomized double blind controlled trial among school children in Bangladesh. BMC Public Health. 13, 514

from the private sector in partnership with the local players.

In Tanzania, Rijk Zwaan, a Dutch multinational vegetable breeder, has made long-term investments in developing and marketing context-appropriate varieties of vegetables.[86] The company created a breeding station in Arusha for local hybrid varieties (e.g., African eggplant, African kale, Chinese pepper) that would enable small-scale local farmers to grow and sell these varieties and integrate them into the dynamic food supply chain. Development and advisory specialists worked closely with farmers to provide advice and training, and the company sold this produce through their network of distributors and markets.

Food Loss & Waste

SUMMARY OF EVIDENCE

There is limited evidence (low confidence) that interventions and programs to minimize food loss and waste in MSMEs and the postharvest/processing stages of the food supply chain (e.g., packaging interventions, distribution and transportation innovations) can positively impact accessibility and availability of safe and nutritious food at the market and consumer levels.

Food loss and waste are commonly cited challenges for MSMEs, especially in the postharvest-processing stages. In sub-Saharan Africa, food loss and waste can be up to 50% of total production, especially for fresh produce and fish, which are predominantly produced by MSMEs.[87,88] Marketing and distribution costs account for about 50-70%[89] of the end-product price, which can be quite prohibitive for smaller enterprises and individual farmers.

Part of these costs are due to the distance that nutritious foods need to travel to reach lower income populations, which are typically further away from urban centers. Long travel distances make it challenging to maintain the quality, freshness, and safety of perishable products—such as fruits and vegetables, grains, dairy, and meat—that have specific storage needs or transport requirements, which also raises concerns about food safety. Addressing these gaps can ensure food loss is minimized, MSMEs are better compensated and more profitable for their crop yields (i.e., reduced production costs), and food safety is ensured. These in turn will lead to greater volumes of safe and nutritious foods entering markets, reduced prices, and greater affordability for consumers. Strong evidence also shows that perceptions of better food safety and quality influence consumer purchasing and consumption practices for these products. Concerns over food safety will push consumers to purchase processed and packaged foods over fresh foods, negatively impacting diets.[90,91,92]

[86] PATH et al. (2019) Where Business and Nutrition Meet: Review of approaches and evidence on private sector engagement in nutrition. MQSUN+ Report. https://mqsunplus.path.org/wp-content/uploads/2018/09/MQSUN_Report-Where-Business-and-Nutrition-Meet_15June2018_FINAL.pdf

[87] Affognon, H., Mutungi, C., Sanginga, P. & Borgemeister, C. (2015). Unpacking postharvest losses in sub-Saharan Africa: a meta-analysis. World Development. 66, 49–68.

[88] FAO. (2011). Global food losses and food waste. Extent causes and prevention. https://www.fao.org/3/i2697e/i2697e.pdf

[89] Henson, S., and Agnew, J. (2021). Are market-based solutions a viable strategy for addressing micronutrient deficiency? Lessons from case studies in sub-Saharan Africa and South Asia. Development Policy Review 39. https://onlinelibrary.wiley.com/doi/abs/10.1111/dpr.12492

[90] Amfo, B., Ansah, I.G., & Donkoh, S.A. (2019). The effects of income and food safety perception on vegetable expenditure in the Tamale Metropolis, Ghana. Journal of Agribusiness in Developing and Emerging Economies. 276-293.

[91] Bukachi, S.A., Ngutu, M., Muthiru, A.W., Lepine, A., Kadiyala, S., Dominguez-Salas, P. (2021). Consumer perceptions of food safety in animal source foods choice and consumption in Nairobi's informal settlements. BMC Nutrition. 7,1-15.

[92] Liguori, J., Trübswasser, U., Pradeilles, R., Le Port, A., Landais, E., Talsma, E. F., Lundy, M., Béné, C., Bricas, N., Laar, A., Amiot, M. J., Brouwer, I. D., & Holdsworth, M. (2022). How do food safety concerns affect consumer behaviors and diets in low- and

With the increasing demand and unaffordability of fresh fruit and vegetables, there are several strategies used across Africa to prevent food loss. For example, the use of hermetic storage bags in Kenya for maize and beans has been effective in preventing spoilage and crop waste, and in managing insect pests.[93] In Ethiopia, there is a push to increase the availability of crates to ensure fresh produce remains intact during transport for sale at the consumer end.[94] Similarly, in Nigeria a study by Plaisier and colleagues looked at the efficacy of different packaging (from raffia baskets to plastic crates) to reduce postharvest loss of tomatoes.[95] The findings showed that crates outperformed baskets in both regions where the project was piloted. The loss in best-quality, A-grade tomatoes was about 16-20% lower with crates than with baskets. The pilot intervention was designed to be context specific and owned by the local value-chain actors. This bottom-up approach not only considered the context but also the cultural factors to find areas in the value chain that can be addressed to improve food productivity and minimize food loss.

In Zambia, Sylva Food Solutions noticed that although many of their smallholder farmer partners produced high-quality nutritious food with every harvest, they remained poor and hardly profitable because they only sold their crops in raw form, at the lowest cost of the value chain.[96] Sylva Food Solutions provided a dual-purpose packaging and processing factory that allowed farmers to package their raw product into a value-added product. The farmers can now sell their products at a premium price with the company taking a small cut.

Similarly, in Guatemala, Nelixia sources and processes cardamom and other spices from smallholder farmers into essential oils, extracts, and formulations for cooking and tea. The sale of these semi- and fully processed products provided farmers with a more stable source of income from the raw materials than the raw crops themselves. Additionally, some processed foods are more shelf stable, addressing the issues of food loss, food safety, and difficulties in transport and storage.[97]

Packaging interventions can also be implemented creatively at the retail level. A study by Even et al. (2024) reviewed several innovations that were co-created and selected for implementation by local vendors with the aim of improving customer purchasing at informal and formal vendor stalls.[98] One of these interventions was to create and promote nutritious mixed product packages that offer customers a pack of a variety of fruits and vegetables at an affordable, bundled price. These packs also came with information about the benefits of eating fresh fruit and vegetables and how to prepare them. The aim of this pack was to introduce a new product while also providing a convenient nutritious option. The study findings were promising and showed a positive impact on the consumers' self-reported consumption of fruits and vegetables. Further research is needed to test the feasibility of offering nutritious foods in smaller, affordable packages to gain valuable insights into consumer

middle-income countries? A systematic review. Global Food Security. 32, Article 100606. https://doi.org/10.1016/j.gfs.2021.100606

[93] Baributsa, D., Njoroge, A.W. (2020). The use and profitability of hermetic technologies for grain storage among smallholder farmers in eastern Kenya. J Stored Prod Res. 87,101618.

[94] Mekonnen, D. A., Galema, S., Nguyen, T., and Berkhout, E. D. (2023). Characteristics of fruit and vegetable MSMEs in Ethiopia: case of Addis Ababa and Ziway/Batu. International Food Policy Research Institute. https://cgspace.cgiar.org/server/api/core/bitstreams/fd813f21-3262-4599-80ce-77b3cf8aba36/content

[95] Plaisier, C., Sibomana, M., Van der Waal, J., Clercx, L., Van Wagenberg, C.P.A., Dijkxhoorn, Y. (2019). Approach for Designing Context-Specific, Locally Owned Interventions to Reduce Postharvest Losses: Case Study on Tomato Value Chains in Nigeria. Sustainability.11(1), 247.

[96] Global Alliance for the Future of Food. (2022). Mobilizing Money & Movements: Creative Finance for Food Systems Transformation. Available from: https://futureoffood.org/wp-content/uploads/2022/05/ga_boh_investment_200dpi.pdf

[97] FAO. (2019). The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction. https://openknowledge.fao.org/server/api/core/bitstreams/11f9288f-dc78-4171-8d02-92235b8d7dc7/content

[98] Even, B., Crawford, S., Shittu, O. F., Lundy, M., Wertheim-Heck, S., Samuel, F. O., Talsma, E. F., Pastori, G., Thi Le, H., Hernandez, R., Brouwer, I. D., & Béné, C. (2024). From Streets to Tables: Bottom–Up Co-creation Case Studies for Healthier Food Environments in Vietnam and Nigeria. Current Developments in Nutrition. 8(8), 104395

preferences and dietary impacts, paving the way for broader scaling strategies.

In Kenya, milk is widely consumed across all income groups, with many competitors in the formal and informal markets. Tarakwo Dairies produces pasteurized milk and distributes directly to consumers through a network of automated milk dispensing units (called milk ATMs). At these milk ATMs, the consumer chooses the volume of milk they wish to purchase, pays with cash, and places their own receptacle to collect the vended milk. This allows the enterprise to reduce production costs by not using suppliers for packaging and provides consumers with flexibility in choosing quantities of product that accommodate their budgets.[99]

Pasteurization also adds value to the milk through improved safety, despite adding 10% to the price. Although FreshMilk competes with unpasteurized milk vendors, it promotes the value of pasteurization in terms of food safety and quality through direct marketing to consumers. This opportunity can be leveraged, in other contexts.

Food Safety

SUMMARY OF EVIDENCE

There is limited evidence (low confidence) to suggest that food safety improvements and interventions in MSMEs positively impact consumer purchasing behavior or consumption of nutritious foods.

Food safety is an important element of the food system and can have a direct impact on food choices and consumption. Concerns about food safety make certain nutritious food products, such as fruits and vegetables, and animal-sourced foods, less desirable. These highly perishable products are at risk for spoilage and food-borne diseases if not stored, handled, and prepared properly. Each food system actor plays a crucial role in maintaining safety standards, yet the fragmentation of supply chains in many countries poses a challenge. Increasing access to technologies, infrastructure, and food safety training is critical in strengthening the trust of consumers. These efforts must be supported by investment in cold-chain infrastructure to reduce postharvest losses and to ensure perishable foods remain safe and retain their nutritional quality as they move through the supply chain. Traditional and informal markets are areas of particular concern, as about 50-60% of food-borne diseases in LMICs are attributed to foods from the informal sector.[100,101] However, traditional and informal markets are also an area of opportunity to educate vendors and consumers and to ensure best safety practices to promote greater purchasing and consumption of nutritious food options.

The Feed the Future Business Drivers for Food Safety (BD4FS) program was implemented in Senegal in 2020, Nepal in 2021, and Ethiopia in 2022.[102] The program targeted growing MSMEs involved in the handling, processing, transporting, and storage of perishable, nutritious foods. The selected businesses worked with food safety experts and trainers from BD4FS to identify relevant and affordable practices and technologies that could create a return on investment.

[99] Global Alliance for Improved Nutrition. (2019). Affordable Milk For All. https://www.gainhealth.org/resources/reports-and-publications/affordable-milk-for-all

[100] Henson, S., Jaffee, S., & Wang, S. (2023). New Directions: For tackling food safety risks in the informal sector of developing countries. Nairobi, Kenya: International Livestock Research Institute. https://www.ilri.org/knowledge/publications/new-directions-tackling-food-safety-risks-informal-sector-developing-0

[101] Global Alliance for Improved Nutrition. (2023). Food Safety, Traditional Markets, and Consumer Demand: A Synthesis of EatSafe's Formative Research Across Low- and Middle-Income Countries. A USAID EatSafe Project Report.

[102] USAID. (2024). Feed the Future Business Drivers for Food Safety

As an incentive, BD4FS assisted MSMEs with marketing activities such as digital messaging on food safety, best practices for consumers, media outreach, and engagement with financial service institutions. Overall, this program supported more than 6,000 businesses across Senegal, Nepal, and Ethiopia and trained more than 20,000 business owners and operators through hundreds of food safety training sessions. The impact on food sales for these MSMEs was strong, with an increase of 12% in sales across all participating businesses.

BD4FS also created a validation program called SME-Pre-HACCP that rewarded businesses for use of food safety management systems. Fifty businesses enrolled, and the program had a 74% success rate, awarding badges to 38 MSMEs who implemented food safety practices (after a third-party audit). This type of validation or certification program can help small businesses by adding value to their products, expanding their marketability, market and trade opportunities, and even increasing desirability among consumers looking for certified safe products.

In a similar way, governments should introduce and ensure compliance of food standards and quality regulations. For example, quality certification programs can help consumers make better informed, safer food choices. They also help MSMEs set themselves apart from others, increasing their competitiveness.

For example, through Copisauro S.L., the farmer-owned cooperative in Guatemala that makes organic honey, farmers can access price premiums because of the official organic certification they maintain through a rigorous set of practices and standards.[103] This ensures the product for consumers is not only safe but also adds value to the cooperative's product.

Technology & Digitization

SUMMARY OF EVIDENCE

There is an evidence gap in the use of ICT in Feed the Future countries to improve dietary intake at the consumer level. The limited evidence that does exist suggests expanding ICT for MSMEs to improve their productivity of nutritious food production.

A strong recommendation in the literature is to create an enabling environment for MSMEs through improved access to ICT and digitization. ICT has the potential to positively disrupt the food supply by making it more productive, cost efficient, transparent, inclusive, and agile. It can also minimize the distance, improve communication, and facilitate business and trade between isolated farmers and MSMEs with other players in the chain. Mobile phones and digital services were among the first ways supply chains utilized digitization.[104,105]

Over recent years, there has been a rapid increase in the number of financial services, mobile lending, e-commerce, and digital platforms. However, there is a gap in evidence on the role of ICT in improving MSME productivity of nutritious foods in Feed the Future countries.

[103] Agridius Foundation. (2023). SMEs in Food Systems: A Framework for Engagement, Guatemala Country Study. Accessed at: https://www.argidius.com/en/learning/smes-in-food-systems-a-framework-for-engagement

[104] Mekonnen, D.A., Termeer, E., Soma, K., van Berkum, S., & de Steenhuijsen Piters, B. (2022). How to engage informal midstream agribusiness in enhancing food system outcomes: What we know and what we need to know better. Wageningen, Wageningen Economic Research, Working Paper 2022-034. https://edepot.wur.nl/567791

[105] Inter-American Development Bank. (2021). Landscaping the agritech ecosystem for smallholder farmers in Latin America and the Caribbean. https://publications.iadb.org/en/landscaping-agritech-ecosystem-smallholder-farmers-latin-america-and-caribbean

Community & Household-Level Interventions

Social & Behavior Change

SUMMARY OF EVIDENCE

There is some evidence (high confidence) on improving dietary intake and consumption practices through social and behavior interventions in Feed the Future countries. SBC interventions combined with other strategies (e.g., social support systems) are more effective in impacting dietary behavior and health outcomes than SBC interventions alone.

Defined as "a set of processes, approaches, tools, strategies, and tactics that promote positive and measurable changes in people's environments, societies, and behaviors," social and behavioral change (SBC) has been used in a large majority of community-level nutrition interventions in the literature. These interventions combine elements of interpersonal communication, social change and community mobilization activities, mass media, and advocacy to support individuals, families, communities, institutions, and countries in adopting and maintaining high-impact nutrition-specific and nutrition-sensitive behaviors or practices. Effective nutrition SBC leverages enablers of behaviors and reduces barriers to adopting and maintaining behaviors over time.[106]

Of the several reviews from the literature assessing SBC interventions to improve maternal and child nutrition, the most common intervention was education. [107,108,109,110,111,112]

Some reviews found that counseling interventions were the most impactful on infant and child outcomes. While most reviews found that the interpersonal communication components were the most impactful in influencing dietary outcomes, study designs should consider multicomponent SBC interventions (e.g., nutrition education plus social support systems), as they can be more effective and a more holistic approach than single component (e.g., nutrition education only).

A review by Webb Girard et al. (2020) found that the interventions with an effectiveness ratio of >0.8 included components that addressed structural and social barriers as well, such as social support and adding objects to the environment (e.g., food, agricultural inputs, supplements).[113] A multi-component SBC intervention by Dozio and colleagues showed that the integration of a psychosocial service

[106] USAID. (2014). Effective At-Scale Nutrition Social and Behavior Change Communication: Technical Guidance Brief (2014-2025). https://2017-2020.usaid.gov/sites/default/files/documents/1864/at-scale-nutritionSBCC-technical-guidance-brief-edit-508.pdf

[107] Webb Girard, A., Waugh, E., Sawyer, S., Golding, L., Ramakrishnan, U. (2020). A scoping review of social behaviour change techniques applied in complementary feeding interventions. Matern Child Nutr. 16(1), e12882. doi: 10.1111/mcn.12882.

[108] Litvin, K., Grandner, G. W., Phillips, E., Sherburne, L., Craig, H. C., Phan, K. A., Patel, A. N., & Dickin, K. L. (2024). How Do Social and Behavioral Change Interventions Respond to Social Norms to Improve Women's Diets in Low- and Middle-Income Countries? A Scoping Review. Current Developments in Nutrition. 8(6).

[109] Graziose, M.M., Downs, S.M., O'Brien, Q., Fanzo, J. (2018). Systematic review of the design, implementation and effectiveness of mass media and nutrition education interventions for infant and young child feeding. Public Health Nutrition. 21(2), 273-287.

[110] Kachwaha, S., Kim, S. S., Das, J. K., Rasheed, S., Gavaravarapu, S. M., Rana, P. P., & Menon, P. (2024). Behavior Change Interventions to Address Unhealthy Food Consumption: A Scoping Review. Current Developments in Nutrition. 8(3), 102104

[111] Mayén, A.L., de Mestral, C., Zamora, G., Paccaud, F., Marques-Vidal, P., Bovet, P., Stringhini S. (2016). Interventions promoting healthy eating as a tool for reducing social inequalities in diet in low- and middle-income countries: a systematic review. Int J Equity Health. 15(1), 205. doi: 10.1186/s12939-016-0489-3.

[112] Watson D, Mushamiri P, Beeri P, Rouamba T, Jenner S, Proebstl S, Kehoe SH, Ward KA, Barker M, Lawrence W; INPreP Study Group. Behaviour change interventions improve maternal and child nutrition in sub-Saharan Africa: A systematic review. PLOS Glob Public Health. 2023 Mar 30;3(3): e0000401.

[113] Webb Girard, A., Waugh, E., Sawyer, S., Golding, L., Ramakrishnan, U. (2020). A scoping review of social behaviour change techniques applied in complementary feeding

(e.g., child-care services and psychological support) with social support (e.g., food voucher) and skill-building components (e.g., information and cooking demonstration) had strong improvements in household food security and psychological well-being of the caregivers.[114] This evidence might suggest that while communication interventions are still a strong approach, combining them with other intervention components in a broader SBC intervention might be more effective.

A review by Litvin et al. looked at interventions that aimed to shift norms to improve women's diets in LMICs. Intervention types included but were not limited to home visits and support groups to engage other family members with influence on food choice and diets in the households (e.g., mothers-in-law, male partners). The findings suggested that although the evidence is still limited, a norms-shifting approach in the design and implementation of interventions to improve diets is promising. Norms can influence dietary practices and nutritional outcomes as they affect access to food and resources, purchasing, and consumption practices. Cultural and social norms within the household also affect how family food resources are allocated and utilized. This might be a future area of research.

For an example of an activity incorporating a norms-shifting approach, the Bhalo Khabo Bhalo Thakbo ("Eat Well, Live Well") campaign in Bangladesh, a multi-phased SBC campaign that ran from 2019 to 2021, was largely social media-based, and directly targeted adolescents, MSMEs, and vendors.[115]

The first phase of the campaign utilized communication interventions that aimed to increase knowledge, attitudes, and awareness among youth about the importance and long-term life impact of better food choices. The second phase was an online pledge for adolescents to openly commit to choosing nutritious foods as a long-term goal. The third phase was a combination of online and offline activities to support adolescents who signed the pledge and to create a social movement to push the industry to change.

There are several strengths of this campaign that may be replicable in other settings. First, it combined a communications intervention with other activities to not only educate but also to motivate the individual and mobilize a collective action among youth. Through their actions on social media, young people raised public awareness about the lack of nutritious food choices available and demanded that their food environments be improved.

This campaign also utilized a peer-to-peer model, giving adolescents agency to create an engaging narrative, raise awareness, and motivate their peers to make better food choices. Lastly, this campaign showed promise in using social media as an effective means to target younger populations and to have greater presence and reach in the public sphere. This channel was especially helpful during the COVID-19 pandemic, when in-person contact was limited, and internet usage increased dramatically. The one limitation was its limited reach to younger adolescents, mostly due to their decreased exposure to the internet, social media, and other channels compared to their older counterparts. Therefore, online delivery systems may work well for older youth, but other settings and platforms such as schools may be more appropriate for younger audiences.

Another example of SBC programming is the impact evaluation of Alive & Thrive's intervention programs between 2010 to 2014, implemented in Bangladesh, Ethiopia, and Vietnam.[116] These programs implemented a broad range of SBC interventions that combine

interventions. Matern Child Nutr. 16(1), e12882. doi: 10.1111/mcn.12882.

[114] Dozio, E., Peyre, L., Oliveau Morel, S., Bizouerne, C. (2016). Integrated psychosocial and food security approach in an emergency context: Central African Republic. Intervention. 14,257–71

[115] Barnett, I., Gonzalez, W., Bipul, M., Chowdhury, D., Djimeu Wouabe, E., Kumar Deo A., and Khondker, R. (2021). Improving Adolescents' Food Choices: Learnings from the Bhalo Khabo Bhalo Thakbo ("Eat Well, Live Well") Campaign in Bangladesh. the Institute of Development Studies and partner organisations. Journal contribution. https://hdl.handle.net/20.500.12413/16949

[116] Kim, S.S., Nguyen, P.H., Tran, L.M., Alayon, S., Menon, P., Frongillo, E.A. (2019). Different Combinations of Behavior Change Interventions and Frequencies of Interpersonal Contacts Are Associated with Infant and Young Child Feeding Practices in

social components with communications activities to improve dietary and care practices of infants and children. The initiative combines interpersonal communication (IPC) delivered at home or during health facility visits with mass media campaigns, community mobilization, and nutrition-sensitive agricultural activities such as designating eggs for young children, and homestead gardens. Although similar models, the specific intervention activities were adapted to be context and culture specific, and participants were exposed to different combinations of the intervention components in different countries.

In Bangladesh, the study results showed significant associations between the study outcomes of interest (e.g., minimum dietary diversity and consumption of iron-rich/fortified foods) and the intervention exposures with more than four contacts with the intervention components. In Ethiopia, exposure to IPC visits with other intervention components was associated with higher odds of achieving minimum dietary diversity, minimum meal frequency, and consumption of iron-rich foods. In Vietnam, exposure to IPC alone or with mass media was associated with better outcomes, but not with the other intervention components.

The Alive & Thrive initiative highlights some considerations for community-level intervention. First, it shows that the combination, intensity, and frequency of behavior change interventions required to have impact on consumption behaviors may differ by context. It also shows that multi-component SBC interventions that incorporate communication with other components to address individual, social, and structural barriers are a more holistic approach.

There are several community-level programs focused on improving egg consumption in LMICs that have had mixed results. In Nigeria, a multi-component intervention campaign to improve egg consumption in children did not produce its intended effects. The Egg Demand Creation Campaign was implemented between 2019 and 2020 and targeted households of children 6 to 59 months.[117] The campaign was specifically designed to employ demand-creation programs to focus on creating a desire for certain foods to influence consumer choice at points of purchase. Thus, the campaign objectives were to emotionally engage caregivers and boost their knowledge and confidence in selecting eggs.

The campaign components included point-of-purchase advertising, household visits, and community-based engagement activities to increase knowledge about the benefits of eggs and how to prepare them. A quasi-experimental study was conducted to evaluate the program, and findings showed that while there was improved self-efficacy and intent to feed eggs to children and some increased household purchasing of eggs, this did not sufficiently improve egg consumption in children. One possible limitation is that the intervention was implemented during the pandemic, when many families faced economic hardships, and the price of eggs increased by 18%. The study authors suggest that demand-side activities and interventions are insufficient on their own in improving consumption in children. Perhaps a combination of both demand-side and supply-side interventions would be most effective in transforming diets.

In contrast, a three-arm cluster randomized controlled trial in rural Burkina Faso showed that SBC interventions that are culturally tailored can improve egg consumption in resource-limited settings even in communities where egg consumption is low.[118] The SBC intervention was a package of monthly nutrition and agriculture training, individual counseling of mothers during monthly sessions, and distribution of a culturally appropriate flipbook

Bangladesh, Ethiopia, and Vietnam. Current Developments in Nutrition. 4(2), nzz140.

[117] Larson, L.M., Frongillo, E.A., Kase, B.E., Neufeld, L.M., Gonzalez, W., Erhabor, I., Djimeu, E.W. (2023). Effectiveness of the Eggs Make Kids demand-creation campaign at improving household availability of eggs and egg consumption by young children in Nigeria: A quasi-experimental study. Matern Child Nutr.19(1), e13447.

[118] McKune, S. L., Stark, H., Sapp, A. C., Yang, Y., Slanzi, C. M., Moore, E. V., Omer, A., & Wereme N'Diaye, A. (2020). Behavior Change, Egg Consumption, and Child Nutrition: A Cluster Randomized Controlled Trial. Pediatrics. 146(6), e2020007930. https://doi.org/10.1542/peds.2020-007930

that reinforced key messages. The study also showed that increases in egg consumption were greater when the SBC intervention was combined with distribution of livestock resources. In the full intervention arm (SBC + livestock), child egg consumption increased from 0.1 to 6.3 eggs per week, while the partial intervention arm (SBC only) saw an increase of only 2.4 eggs. The authors state that SBC interventions that include the empowerment of women and their decision-making and distribution of livestock assets are more robust strategies that can effect positive change.

A similar intervention was conducted in rural Malawi, whereby a cluster randomized controlled trial aimed to evaluate the effect of an egg intervention (daily egg provision for 6 months) on dietary intake in infants and young children.[119] The findings showed that the intervention improved dietary intake. At baseline, 4% of children reported to have consumed eggs on the previous day. This increased to 85% at the 3-month visit and 71% at the 6-month visit in the egg intervention group. In the control group, the proportion remained low at 6–7%. Despite this, egg consumption did not sufficiently improve micronutrient intake in infants and young children.[120] This study suggests that SBC interventions are good strategies to change dietary intake and are more effective when coupled with other social and structural components (e.g., livestock resources).

An example of a community-level program that addresses both the demand and supply sides of the food system to improve consumption is the Good Seed Initiative in Tanzania.[121] The goal of the program was to promote the production and consumption of nutritious African vegetables, aiming to improve food security and encourage nutritious food choices among consumers while also strengthening the capacity and productivity of smallholder farmers and MSMEs. Activities included awareness program campaigns at schools, markets, villages and hospitals, promotional materials like handouts and nutritional information on household visits, traveling cooking demonstration shows, and market incentives for producers. The program ran from June 2014 to August 2015. Study findings showed a statistically significant and positive impact on the dietary diversity of children and women. The study showed benefits in designing interventions to support producers and, consequently, to increase the availability of local food products and competition with standard vegetables and non-traditional foods in supermarkets and other markets.

[119] Stewart, C. P., Caswell, B., Iannotti, L., Lutter, C., Arnold, C. D., Chipatala, R., Prado, E. L., & Maleta, K. (2019). The effect of eggs on early child growth in rural Malawi: the Mazira Project randomized controlled trial. The American journal of clinical nutrition. 110(4), 1026–1033. https://doi.org/10.1093/ajcn/nqz163

[120] Perez-Plazola, M., Diaz, J., Stewart, C. P., Arnold, C. D., Caswell, B. L., Lutter, C. K., Werner, E. R., Maleta, K., Turner, J., Prathibha, P., Liu, X., Gyimah, E., & Iannotti, L. (2023). Plasma mineral status after a six-month intervention providing one egg per day to young Malawian children: a randomized controlled trial. Scientific reports. 13(1), 6698. https://doi.org/10.1038/s41598-023-33114-1

[121] Ochieng, J., Afari-Sefa, V., Karanja, D., Kessy, R., Rajendran, S., Samali, S. (2018). How promoting consumption of traditional African vegetables affects household nutrition security in Tanzania. Renewable Agriculture and Food Systems. 33(2),105-115.

Food Safety Education

SUMMARY OF EVIDENCE

There is limited evidence (low confidence) that food safety education interventions positively affect consumer knowledge of food safety and subsequently consumer choice to purchase safe foods.

Although the evidence is limited, the impact of food safety concerns on dietary behaviors in LMICs cannot be ignored. Some key concerns among consumers include fear of pesticides and fertilizers, hygiene in and around food outlets and markets, vendor practices and handling, and household storage and preparation methods. These concerns can lead to decreased purchasing and consumption of nutritious foods including animal-sourced foods and fresh produce. Instead, consumers may reach for starchy staples or ultra-processed foods.[122]

Community-level food safety interventions can positively impact consumer choice by increasing consumer knowledge and awareness of safe foods. For example, Muungano wa Wanavijiji, a Kenyan federation of the urban poor, has employed a mapping project called Red Balloon to improve food safety and handling among street vendors and livestock keepers.[123] The floating red balloon serves as an "eye in the sky," a visible signal to help the community identify and deal with safety hazards that may threaten the safety of their food and water supplies. The balloon handler walks through the community taking photos, creating a map to show mobile vendors and kiosks occupational hazards and places to avoid such as open sewers and garbage piles. This project not only collected important data to guide future community efforts and projects but also built awareness among the community members, vendors, and consumers to promote better food safety.

Feed the Future's EatSafe program was a community-level food safety intervention implemented in traditional markets in Nigeria and Ethiopia. The aim of the program was to increase consumer demand for nutritious foods through food safety interventions and greater consumer engagement.[124]

In Nigeria, a "Safe Food Market Stand" was open six days a week to provide information through conversation, visual aids and handouts, and activities (e.g., cooking, food handling, and handwashing demonstrations) about food safety through direct interaction with shoppers. The stand helped increase consumer knowledge about food safety and provided consumers with the communication skills and confidence to engage in discussions with food vendors to make better purchasing decisions. In a 12-month period, more than 10,000 consumers visited the two stands, and 7,000 demonstrations were conducted. Evaluations of the intervention showed the stand was appreciated by the community members and shoppers, with the demonstrations particularly popular. The stand visitors self-reported a change in their behavior as well as increased knowledge and awareness of food safety best practices. Just over half of the respondents reported that the intervention changed how they shopped for, handled, and prepared food.

[122] Liguori, J., Trübswasser, U., Pradeilles, R., Le Port, A., Landais, E., Talsma, E. F., Lundy, M., Béné, C., Bricas, N., Laar, A., Amiot, M. J., Brouwer, I. D., & Holdsworth, M. (2022). How do food safety concerns affect consumer behaviors and diets in low- and middle-income countries? A systematic review. Global Food Security. 32, 100606

[123] Global Alliance for the Future of Food. (2020). Systemic Solutions for Healthy Food Systems: Approaches to Policy & Practice. https://futureoffood.org/insights/solutions-for-healthy-foodsystems/#:~:text=Systemic%20Solutions%20for%20Healthy%20Food%20Systems%20is%20a%20guide%20for,systems%20through%20policy%20and%20practice

[124] Nordhagen, S., Garsow, A., Swartz, H., Alhassan, M.M., and Isyaku, I. (2024). Bringing Food Safety to the Shoppers: Implementing Informational Food Safety Stands in Traditional Markets in Nigeria. Global Alliance for Improved Nutrition (GAIN). Working Paper #40. DOI: https://doi.org/10.36072/wp.40

Most respondents mentioned that they began buying food from vendors who sold clean food.

A similar study in Ethiopia used mass media campaigns to improve consumer awareness of vegetable-related, food-borne illnesses in informal markets.[125] Over a 9-month period, a multimedia behavior change intervention (i.e., household visits, print ads, radio, television, and social media posts) was implemented across two cities to encourage women to choose safe tomatoes at markets and safely prepare them at home. Post-tests on self-reported food safety behavior and related behavioral determinants (i.e., intentions, knowledge, attitudes, norms, and agency) suggested that household visits were associated with safer purchasing and preparation and increased odds of intentions to buy safer tomatoes. Traditional media (print, TV, and radio ads) were associated with improved behavior, food safety attitudes including perceived health benefits, social norms, self-efficacy, and knowledge, while social media recall showed no association with any of the outcomes.

Home Gardens & Other Agricultural Community Interventions

SUMMARY OF EVIDENCE

There is limited evidence (low confidence) on the effect of home gardens and other agricultural interventions, on household, maternal, or child diets and nutritional status in Feed the Future countries. It is unclear if these interventions encourage sustainable behavior change over longer terms.

Home gardens are another type of community-level and household-level intervention that can improve consumption of nutritious, locally produced food by making these food products accessible for households that otherwise cannot afford to purchase expensive produce, especially with the rising costs of food.[126] Importantly, across the evidence base, there are mixed findings regarding the impact of agricultural interventions on diets due to short intervention periods and a lack of sustained behavior change. Further, many studies examine changes in micronutrient status and anthropometric outcomes, as opposed to diets.[127]

For example, in Bangladesh, several studies show that home garden interventions produce enough vegetables to meet household needs.[128,129] A study conducted in India showed that home gardens can yield enough produce to both support the household nutritional needs and have excess to sell. Preparation and consumption of green-leafy vegetables increased from a weekly mean frequency of 1.9 to 2.4. Weekly frequency and quantity of eggs consumed more than doubled among households who set up backyard poultry production.[130]

However, some studies in Africa show different results. In West Africa, a cRCT review by

[125] Madjdian, D. S., van Asseldonk, M., Talsma, E. F., Amenu, K., Gemeda, B. A., Girma, S., Roesel, K., Grace, D., Knight-Jones, T. J. D., & de Vet, E. (2024). Impact of a mass-media consumer awareness campaign on food safety behavior and behavioral determinants among women in Dire Dawa and Harar, Ethiopia. Food Control. 163, 110509.

[126] Dizon, F., Josephson, A., & Raju, D. (2021). Pathways to better nutrition in South Asia: Evidence on the effects of food and agricultural interventions. Global Food Security. 28, 100467

[127] Osei, A., Pandey, P., Nielsen, J., Pries, A., Spiro, D., Davis, D., Quinn, V., & Haselow, N. (2017). Combining Home Garden, Poultry, and Nutrition Education Program Targeted to Families with Young Children Improved Anemia Among Children and Anemia and Underweight Among Nonpregnant Women in Nepal. Food and nutrition bulletin. 38(1), 49–64. https://doi.org/10.1177/0379572116676427

[128] Irfanullah, H. Md., Adrika, A., Ghani, A., Khan, Z. A., & Rashid, Md. A. (2008). Introduction of floating gardening in the north-eastern wetlands of Bangladesh for nutritional security and sustainable livelihood. Renewable Agriculture and Food Systems. 23(2), 89–96. doi:10.1017/S1742170507002074

[129] Ferdous, Z., Datta, A., Anal, A. K., Anwar, M., & Khan, A. S. M. M. R. (2016). Development of home garden model for year-round production and consumption for improving resource-poor household food security in Bangladesh. NJAS - Wageningen Journal of Life Sciences. 78, 103-110.

[130] Murty, P.V.V.S., Rao, M.V. & Bamji, M.S. (2016). Impact of Enriching the Diet of Women and Children Through Health and Nutrition Education, Introduction of Homestead Gardens and Backyard Poultry in Rural India. Agric Res. 5, 210–217 https://doi.org/10.1007/s40003-016-0206-x

Depenbusch et al. evaluated three randomized controlled trials in Kenya, Tanzania, and Uganda and found that an integrated home garden project, which included vegetable seed distribution and hands-on training in gardening, had no significant effect on vegetable consumption over a two-year period.[131]

In Tanzania, the intervention led to a 20% increase in the number of households producing vegetables; however, in Kenya and Uganda, the results showed no increase in vegetable production. Some limitations of the study might be the low participation rate due to staffing issues, project implementation difficulties, quality of facilitation, incentives, timeliness of invitations, and whether the training appropriately addressed the participants' true needs. Study results also may have been affected by households who already produce substantial quantities of vegetables and are more interested in selling than consuming.

More recently, a cRCT in Tanzania enrolled more than 1,000 women of reproductive age to test whether vegetable home gardens could improve women's dietary diversity, household food security, maternal and child iron status, and the probability of women consuming nutritious food groups over a 3-year period.[132] Households in the intervention villages received agricultural training, inputs to promote home production of nutritious crops, and nutrition and health education. Results after one year of the intervention found significant improvements in dietary diversity. However, at three years, the difference in dietary diversity disappeared, even though the number of women who grew at least one crop was significantly higher (75 percentage points, 95% CI: 72, 81) in intervention households compared to controls. Barriers to maintaining a home garden included costs, lack of irrigation and fencing materials, and poor family support.

Similarly, a 2-year cRCT implemented by Helen Keller Intl in Burkina Faso found statistically significant improvements in dietary intake and overall dietary diversity scores in women through an integrated agriculture and nutrition program.[133] These positive results extended to increased household consumption, reduced food purchases, and reduced use of food from stores between baseline and endline in intervention households as compared to control households.

An analysis by Muthini et al. (2020) of subsistence production and dietary diversity in Kenya showed promising evidence that increased production diversity on smallholder farms is associated with increased dietary diversity (observed in both household-level dietary diversity scores, and individual-level dietary diversity scores for women and children).[134] The average magnitude of these effects was small (reasons for the small effect was not examined), however, which the authors note as a potential research gap. The study authors also suggest that while agricultural diversification can be a strategy to improve dietary diversity and consumption among smallholder households, strengthening markets and improving smallholder access to markets seem to be a more effective strategy.

Given the limited demonstrated success of interventions on household consumption in the short term, greater exploration and research is required to assess the suitability, design, and effectiveness of home garden interventions, especially the production of traditional and Indigenous foods, in different contexts and over longer periods.

[131] Depenbusch, L., Schreinemachers, P., Roothaert, R., Namazzi, S., Onyango, C., Bongole, S., & Mutebi, J. (2021). Impact of home garden interventions in East Africa: Results of three randomized controlled trials. Food Policy. 104, 102140.

[132] Blakstad, M. M., Mosha, D., Bliznashka, L., Bellows, A. L., Canavan, C. R., Yussuf, M. H., Mlalama, K., Madzorera, I., Chen, J. T., Noor, R. A., Kinabo, J., Masanja, H., & Fawzi, W. W. (2022). Are home gardening programs a sustainable way to improve nutrition? Lessons from a cluster-randomized controlled trial in Rufiji, Tanzania. Food policy, 109, 102248. https://doi.org/10.1016/j.foodpol.2022.102248

[133] Olney, D. K., Bliznashka, L., Pedehombga, A., Dillon, A., Ruel, M. T., & Heckert, J. (2016). A 2-Year Integrated Agriculture and Nutrition Program Targeted to Mothers of Young Children in Burkina Faso Reduces Underweight among Mothers and Increases Their Empowerment: A Cluster-Randomized Controlled Trial. The Journal of Nutrition. 146(5), 1109–1117. https://doi.org/10.3945/jn.115.224261

[134] Muthini, D., Nzuma, J., & Qaim, M. (2020). Subsistence production, markets, and dietary diversity in the Kenyan small farm sector. Food Policy. 97, 101956. https://doi.org/https://doi.org/10.1016/j.foodpol.2020.101956

School-Level Interventions

Multi-Component Interventions

SUMMARY OF EVIDENCE

Multi-component school-based interventions such as the Nutrition Friendly Schools Initiative show promising results in other LMICs to improve nutrition and diet-related health outcomes.

The school food environment—encompassing policies, programming and services, nutrition education, and staff—plays a crucial role in shaping child and adolescent knowledge, attitudes, and practices toward healthy diets. Current evidence from systematic reviews and meta-analyses focuses on single-domain interventions like nutrition education, which do not address the multiple factors contributing to demand for nutritious foods, including food promotion, food access and availability, and food policies in and outside of the school.

There is increasing evidence supporting integrated multi-component interventions including, but not limited to, nutrition and physical education; promoting the sale of healthier foods and beverages; encouraging participation in school meal and snack programs; role-modeling healthy eating behaviors and physical activity; providing access to free drinking water, sanitation, and hygiene services; and restricting marketing of foods and beverages high in saturated fats, trans fats, free sugars, or salt both inside and outside of school. However, most of the existing evidence for these interventions comes from high-income countries, limiting its applicability to resource-constrained settings.[135]

Building on existing programs and initiatives, including the Health Promoting School approach and the Focusing Resources on Effective School Health (FRESH) initiative, WHO and partners launched the Nutrition Friendly Schools Initiative (NFSI) in 2020 to provide a framework for ensuring integrated school-based programs that address both undernutrition and overnutrition. The NFSI has since been implemented in a number of countries, including Burkina Faso.[136]

[135] World Health Organization. (2020). Nutrition action in schools: a review of evidence related to the Nutrition-Friendly Schools Initiative. Licence: CC BY-NC-SA 3.0 IGO. https://iris.who.int/bitstream/handle/10665/338781/9789241516969-eng.pdf

[136] Delisle, H. F., Receveur, O., Agueh, V., & Nishida, C. (2013). Pilot project of the Nutrition-Friendly School Initiative (NFSI) in Ouagadougou, Burkina Faso and Cotonou, Benin, in West Africa. Global Health Promotion. 20(1), 39–49. https://doi.org/10.1177/1757975913476907

Food Procurement & Provision

SUMMARY OF EVIDENCE

While many Feed the Future countries have implemented school meal programs, evaluation of evidence on their effectiveness has been limited to micronutrient adequacy and anthropometric or educational outcomes. Therefore, there is limited evidence (low confidence) that school meals improve demand for healthy diets in Feed the Future contexts. However, studies in high-income countries and other LMICs have shown improvements in relieving hunger and dietary intake through school meal programming.

School meal programs, which provide school-aged children and adolescents with meals, snacks, or take-home rations, are among the most widespread safety nets globally, reaching an estimated 418 million children in 2022, and operating in more countries than any other safety net.[137]

There is well-documented evidence on the effects of school meals on attendance, academic performance, stunting, and in some cases micronutrient deficiencies.[138,139] However, there is a lack of understanding in how school meals improve dietary outcomes (i.e., direct measures of consumption such as macro- and micro-nutrient intake, dietary diversity and dietary patterns such as breakfast consumption, meal skipping).

In recent years, "home-grown" school feeding programs have gained significant momentum. These initiatives integrate the institutional procurement of locally produced food into school meal programs, aiming to stimulate local economic growth and drive agricultural transformation. Over the past decade, African governments have increasingly exhibited support for school meals through their budget allocations and policy frameworks.[140] However, there are few rigorous evaluations of home-grown school feeding programs compared to standard school feeding programs in Feed the Future contexts.[141]

Leveraging home-grown meals presents a prime avenue for exposing children and adolescents to nutritious foods and potentially steering dietary preferences and consumption patterns towards these foods. Notably, children within these settings often exhibit greater receptivity to dietary changes, making them pivotal agents for broader shifts in lifelong eating habits.

More research is needed to evaluate how to use school meal programs to generate demand, as well as the multi-generational and broader societal impact of school meal programs, including on indirect beneficiaries such as smallholders and MSMEs.

[137] World Food Programme. (2022). The State of School Feeding Worldwide 2022. https://www.wfp.org/publications/state-school-feeding-worldwide-2022

[138] Drake, L., Fernandes, M., Aurino, E., Kiamba, J., Giyose, B., Burbano, C., Alderman, H., Mai, L., Mitchell, A., Gelli, A. (2017). School Feeding Programs in Middle Childhood and Adolescence. In: Bundy DAP, Silva ND, Horton S, Jamison DT, Patton GC, editors. Child and Adolescent Health and Development. 3rd ed. Washington (DC): The International Bank for Reconstruction and Development / The World Bank. Chapter 12. PMID: 30212132.

[139] Wang, D., Shinde, S., Young, T., Fawzi, W.W. (2021). Impacts of school feeding on educational and health outcomes of school-age children and adolescents in low- and middle-income countries: A systematic review and meta-analysis. Journal of Global Health.11, 04051. doi: 10.7189/jogh.11.04051. PMID: 34552720; PMCID: PMC8442580.

[140] Regional Centre of Excellence against Hunger and Malnutrition, the UN World Food Programme, ECOWAS and the School Meals Coalition. (2024). Home grown school feeding in West Africa: A Landscape Analysis. https://docs.wfp.org/api/documents/WFP-0000158900/download/?_ga=2.259429002.1694842920.1729479412-652665843.1728393992

[141] Singh, S., Fernandes, M. (2018). Home-grown school feeding: promoting local production systems diversification through nutrition sensitive agriculture. Food Security. 10, 111–119. https://doi.org/10.1007/s12571-017-0760-5

Regulating School Food Environments

SUMMARY OF EVIDENCE

There is limited evidence (low confidence) on the impact of school regulations to reduce exposure to marketing of foods and beverages high in saturated fats, trans fats, free sugars, or salt in Feed the Future countries.

WHO has provided guidance for creating regulatory interventions aimed at shaping the school food environment, which includes all areas and conditions within and around schools where food is available, acquired, or consumed. WHO advocates for establishing nutrition standards for foods offered and sold within schools, as well as limiting the marketing of foods and beverages high in saturated fats, trans fats, free sugars, or salt in these settings. However, there is limited documentation on the global nature of such policies, as well as a lack of evidence regarding their implementation and impact.[142]

A recent review by Perry et al. found that in LMICs, four countries had national, mandatory policies to limit marketing for or sales of foods and beverages high in saturated fats, trans fats, free sugars, or salt within and immediately surrounding schools, nine countries had competition policies,[143] and nine countries had both marketing and competition policies.[144] Importantly, none of the LMICs included were USAID countries.

School-Based Nutrition Education

SUMMARY OF EVIDENCE

There is limited evidence (low confidence) on the impact of school-based nutrition education interventions to promote knowledge, attitudes, and practices on healthy eating in Feed the Future countries.

Effective school-based nutrition education interventions incorporate theory-based strategies and skill-building activities (such as school gardens or cooking demonstrations) with sufficient time and intensity to shape food culture and attitudes around healthy eating, and to foster skill development.

Successful interventions also employ appropriate teaching methods with ample teacher training opportunities. These interventions are culturally relevant and actively involve families. When school nutrition education programs are integrated with the surrounding community, the benefits extend beyond students, positively affecting school staff, families, and the broader neighborhood.

Evidence on the effectiveness of school nutrition education interventions has been largely drawn from HICs. Of the few reviews in LMICs, several have observed improvements on

[142] WHO. (2021). Implementing school food and nutrition policies: a review of contextual factors. Licence: CC BY-NC-SA 3.0 IGO. https://www.who.int/publications/i/item/9789240035072

[143] Competitive food policies were defined as policies on any food or beverage sold in schools outside of a national school meal program. This includes foods sold in canteens, kiosks, tuck shops, vending machines, and from vendors coming onto school grounds. These were categorized as complete restriction, partial restriction, categorical restriction, nutrient restriction or ingredient restriction.

[144] Perry, M., Mardin, K., Chamberlin, G., Busey, E. A., Taillie, L. S., Dillman Carpentier, F. R., & Popkin, B. M. (2024). National Policies to Limit Food Marketing and Competitive Food Sales in Schools: A Global Scoping Review. Advances in Nutrition. 15(8), 100254. https://doi.org/10.1016/j.advnut.2024.100254

nutrition knowledge, fruit and vegetable intake, and decreases in SSB consumption.[145,146,147,148] Importantly, studies included within these reviews were not conducted in USAID countries.

More recently, trials conducted in Ethiopia and Bangladesh offer some promise. In Ethiopia, a non-masked, cRCT delivered a package of school-based nutrition-education interventions to 536 adolescent girls during one school semester. The study findings suggest that the intervention improved practices related to dietary diversity (adjusted odds ratio 5 ·37 [95% CI 3 ·04–9 ·50], p<0 ·0001) and meal frequency among young adolescent girls. The intervention was limited in changing other food choice behaviors, such as junk food consumption based on nutrition education alone.[149] Additionally, both adolescent girls and their parents in the intervention group had higher knowledge at endline than those in the control group about dietary diversity, meal frequency, and consumption of foods and beverages high in saturated fats, trans fats, free sugars, or salt.

Similar results were found in a matched, pair-cluster RCT in Bangladesh with 300 adolescent girls, whereby consumption of organ meat, vitamin A-rich fruits and vegetables, legumes, nuts, and seeds in the intervention group was higher compared to controls at endline.[150] In addition to school-based nutrition education, there have been significant efforts toward the implementation of school-based agricultural education. The key objectives of such education interventions include:

- Contributing to youth's academic, vocational, and life-skills development through experiential learning methods.
- Improving rural livelihoods by transferring skills and agricultural innovations into the home and community through schools.

There is a need to understand how agricultural education translates into demand for healthy diets in Feed the Future contexts.

[145] Shinde, S., Wang, D., Moulton, G. E., & Fawzi, W. W. (2022). School-based health and nutrition interventions addressing double burden of malnutrition and educational outcomes of adolescents in low- and middle-income countries: A systematic review. Maternal and Child Nutrition. e13437.
[146] Kyere, P., Veerman, J. L., Lee, P., & Stewart, D. E. (2020). Effectiveness of school-based nutrition interventions in sub-Saharan Africa: a systematic review. Public health nutrition. 23(14), 2626–2636. https://doi.org/10.1017/S1368980020000506
[147] Klingberg, S., Draper, C. E., Micklesfield, L. K., Benjamin-Neelon, S. E., & van Sluijs, E. M. F. (2019). Childhood Obesity Prevention in Africa: A Systematic Review of Intervention Effectiveness and Implementation. International Journal of Environmental Research and Public Health.16(7), 1212. https://doi.org/10.3390/ijerph16071212
[148] Abdel Rahman, A., Jomaa, L., Kahale, L. A., Adair, P., & Pine, C. (2018). Effectiveness of behavioral interventions to reduce the intake of sugar-sweetened beverages in children and adolescents: a systematic review and meta-analysis. Nutrition Reviews. 76(2), 88–107. https://doi.org/10.1093/nutrit/nux061
[149] Kim, S. S., Sununtnasuk, C., Berhane, H. Y., Walissa, T. T., Oumer, A. A., Asrat, Y. T., Sanghvi, T., Frongillo, E. A., & Menon, P. (2023). Feasibility and impact of school-based nutrition education interventions on the diets of adolescent girls in Ethiopia: a non-masked, cluster-randomised, controlled trial. The Lancet. Child & adolescent health, 7(10), 686–696. https://doi.org/10.1016/S2352-4642(23)00168-2
[150] Nyma, Z., Rahman, M., Das, S., Alam, M. A., Haque, E., & Ahmed, T. (2023). Dietary diversity modification through school-based nutrition education among Bangladeshi adolescent girls: A cluster randomized controlled trial. PLoS One. 18(3), e0282407.

EVIDENCE GAPS & FUTURE RESEARCH

This literature review found significant uncertainty in the existing evidence on interventions to enhance the supply and demand for nutritious foods, highlighting emerging considerations for planning, implementing, and monitoring these interventions. Notably, this review is based on peer-reviewed and grey literature available in the public domain, which limits the applicability of findings, particularly for existing programs implemented in Feed the Future contexts. To better understand and apply this evidence, it is crucial to consider the context in which interventions are implemented by leveraging other sources of data, including unpublished or private sector program evaluations, as well as traditional knowledge.

1. Research in LMICs

Research on food environments has traditionally focused on high-income countries, leaving significant evidence gaps in the context of LMICs. Characterizing food systems in LMICs presents inherent complexities and variations based on infrastructure, socio-cultural factors, trade liberalization, economic development, rurality, governance, and other factors that impact food access and availability, food promotion, food safety, food desirability and convenience, and food affordability.

2. Better Understanding of Diverse Target Populations

Designing and delivering appropriate interventions within and outside of food systems requires an understanding of the target population and context, including drivers and barriers of food choice across personal, family, digital, and external food environments. Currently, many interventions focus on two population groups—women and children—due to their nutrition vulnerability. While women are responsible for food preparation, they may be limited in what they can purchase. There is a need to understand gender-related barriers that constrain demand for healthy diets. There is insufficient evidence on the effectiveness of interventions in creating demand in other population groups, especially men, who in rural contexts decide what crops are produced, how much of the produce and livestock products goes to market, what food is purchased, and how food portions are distributed among household members. In addition, few interventions (outside of schools) mobilized adolescents and youth—the next generation who will directly face the consequences of poor availability and accessibility to nutritious foods. Understanding food choice in this age group, while challenging, is important for broader understanding of influence on households.

3. Comprehensive Metrics and High-Quality Data

Complex food systems can be better understood by developing appropriate metrics and measurement tools,[151] employing mixed-methods research that leverages other forms of knowledge, and collecting routine high-quality data, especially within markets. This is applicable for both public- and private-sector interventions such as regulation of digital food environments (i.e., frequency of ultra-processed food advertisements on social media), as well as food safety considerations to identify handling and storage issues. Further research should explore how to collect appropriate food choice data from delivery platforms and settings aside from schools to reach youth, such as social media and internet-based interventions.[152,153]

[151] USAID Advancing Nutrition. 2021. Methods, Tools, and Metrics for Evaluating Market Food Environments in Low- and Middle-Income Countries. Arlington, VA: USAID Advancing Nutrition.

[152] Chau MM, Burgermaster M, Mamykina L. The use of social media in nutrition interventions for adolescents and young adults-A systematic review. Int J Med Inform. 2018 Dec; 120:77-91.

[153] Khizar, M., Ruel-Bergeron, J., Zavala, E., Chang, K., Kang, Y., de Pee, S., Black, R. E., & Christian, P. Delivery platforms for reaching adolescents with nutrition interventions in low- and middle-

Additionally, survey data that characterizes cognitive elements of food culture can help to inform campaigns for shifting norms and making foods more desirable and enjoyable. Using these data, interventions can be improved in terms of their design features and their evaluations.

There is also potential for partnering with the World Bank in its initiative aimed at establishing a globally standardized enhanced national poverty line approach that incorporates local costs and affordability of healthy diets to better help focus social protection, targeted income transfers, and national policies to support healthy diet supply and demand.

Finally, there is a need to integrate novel performance indicators into the log frame approach to inform and tailor programming activities, as well as disseminating and translating such results into action. This means providing implementers with the time and budget necessary to conduct both initial and ongoing evaluations, allowing them to understand how consumer preferences and market dynamics evolve throughout the entire program cycle.

4. Research on Packages of Interventions

No single measure is a magic bullet for promoting healthy diets. The most effective response is a comprehensive one, implementing a range of complementary and coordinated actions across sectors that operate coherently and synergistically to contribute to the broader policy goal. Across most interventions included in this review, few were multi-component in nature. Because of the breadth of policies and interventions that may impact diets, there is the possibility that one policy or intervention may negate another's effectiveness or have unintended spillover effects.

As of 2022, 42 countries have measured the extent of food environment policy implementation using the Healthy Food Environment Policy Index (Food-EPI),[154] developed in 2013 by the International Network for Food and Obesity/NCDs Research, Monitoring and Action Support (INFORMAS) to help governments assess their progress; identify policy gaps in the creation of nutritious food environments; and set an agenda for change. Of relevance, Burkina Faso, Tanzania, Senegal, and Uganda have started assessments, while Ghana, Kenya, and Guatemala have completed the assessment of government action towards improving food environments.

In Ghana, the extent of implementation of food environment policies was assessed and priority actions were identified. Twenty-one areas of good practice were in the implementation phase, which included the adoption of FAO's Codex Alimentarius[155] guidelines for regulating nutrition labeling for packaged foods and prohibiting misleading claims on foods; however, enforcement was questionable. Importantly, no government action was found for infrastructure support, which included food composition standards for food service retailers, or nutrition information systems for labeling and interaction with the private sector. In relation to international best practices, 75% of policy areas were assessed as low or with very little government action (i.e., taxes, subsidies, food retail, and provision).[156]

In contrast, Kenya's baseline assessment found up to one-third of the indicators of government policy action rated to be in the implementation phase, and half of the policy indicators rated as in the development stage. No indicator was ranked in the evaluation phase. Compared against international benchmarks, no indicator

income countries. Annals of the New York Academy of Sciences. 2024 (Online first)

[154] Swinburn B, Vandevijvere S, Kraak V, Sacks G, Snowdon W, Hawkes C, Barquera S, Friel S, Kelly B, Kumanyika S, L'Abbé M, Lee A, Lobstein T, Ma J, Macmullan J, Mohan S, Monteiro C, Neal B, Rayner M, Sanders D, Walker C; INFORMAS. Monitoring and benchmarking government policies and actions to improve the healthiness of food environments: a proposed Government Healthy Food Environment Policy Index. Obes Rev. 2013 Oct;14 Suppl 1:24-37. doi: 10.1111/obr.12073. PMID: 24074208.

[155] The Codex Alimentarius is a collection of internationally adopted food standards and related texts presented in a uniform manner. These food standards and related texts aim to protect consumers' health and ensure fair practices in the food trade.

[156] Laar, A., Barnes, A., Aryeetey, R., Tandoh, A., Bash, K., Mensah, K., Zotor, F., Vandevijvere, S., Holdsworth, M. (2020) Implementation of healthy food environment policies to prevent nutrition-related non-communicable diseases in Ghana: National experts' assessment of government action. *Food Policy*, 93, 101907. https://doi.org/10.1016/j.foodpol.2020.101907

was rated as high implementation, and there were only four indicators scored as moderate implementation. More than two-thirds of the indicators were rated as low or little implementation. These findings suggest that most government policy action to create healthier food environments in Kenya is still at the development stage, with policy action that is more fully developed not fully meeting international benchmarks.[157]

In comparison, Guatemala scored the lowest in the implementation of 50 food environment policies, with 26% of indicators showing no implementation, 28% at very low implementation, 42% at low implementation, and 4% at medium implementation (none were rated high). Indicators at medium implementation were related to the use of evidence for developing policies and ingredient list/nutrition information panels on packaged foods. Seventy-seven actions were recommended for immediate action, including those related to strengthening governance, food labeling, food provision, and safe drinking water in schools.[158]

While understanding the landscape of policies that exist is important, evaluation of the effect of policies on consumer demand is critical. Therefore, future research should prioritize developing, implementing, and evaluating context-specific packages of interventions or multi-duty actions to understand effects on diets, as well as synergies and trade-offs.

5. Hidden Middle

The middle of the food system is often overlooked and under researched but plays a pivotal role in consumer demand. There is a need to build the evidence base on effective interventions including marketing of nutritious foods and social and behavior change among MSMEs (i.e., processors, packagers, distributors) to improve knowledge, attitudes, and practices on nutritious and safe foods.

6. Research and Evaluation of Prioritized Interventions at the Retail Level

Understanding the unique, contextual needs of consumers is essential when developing market-based strategies to increase their demand for nutritious foods. Research is needed on the combined effect of taxes and subsidies in the public sector, linkages between social protection programs and markets, and supply and demand interventions for MSMEs in the private sector. Informal food vendors and MSMEs are an extremely important and large proportion of the private sector with great potential to be leveraged to transform food systems and improve consumption. However, greater understanding and support are required to mitigate the barriers and challenges informal food vendors face and to ensure their success to increase the availability, accessibility and affordability of nutritious and safe foods within markets (e.g., financial capital, infrastructure, resources, training and capacity building, ICT).

For example, because most nutritious foods are purchased loose, as unbranded products, from informal entrepreneurs and independent retailers, evidence is needed on how to promote last-mile delivery of fresh or unbranded nutritious foods through advertising, marketing and branding. Additionally, research is needed to understand what incentivizes informal sector actors and what support systems enable the success of informal actors.

Research and evaluation are needed identify more demand-side interventions at the retail level to shape food choice and diets, including how reformulation policies influence consumer willingness to purchase and how sensory appeal shapes demand for healthier foods.

[157] Asiki, G; Wanjohi, M; Barnes, A; Bash, K; Vandevijvere, S, Muthuri S, Kimani E, Holdsworth, M. (2019). Benchmarking policies for creating healthy food environments in Kenya to prevent diet-related non-communicable diseases (NCDs). Healthy Food Environment Policy Index (Food-EPI) country scorecards and priority recommendations for action in Kenya. doi.org/10.17608/k6.auckland.8251415

[158] Sánchez-Nóchez, C.M., Ramirez-Zea, M., Vandevijvere, S. et al., Benchmarking public policies to create healthy food environments compared to best practice: the Healthy Food Environment Policy Index in Guatemala. Arch Public Health **80**, 174 (2022). https://doi.org/10.1186/s13690-022-00928-w

7. Implementation Studies

Current evaluations poorly capture implementation fidelity, including intervention exposure, quality, and cost. Evaluations are critical to replicate and scale interventions, provide appropriate resourcing, and have confidence that observed effects (or lack thereof) can be attributed to the intervention.

Future evaluations should prioritize mixed methods to understand equity aspects, such as intervention effectiveness by socioeconomic status, setting (rural versus urban), and gender that may correlate with diet quality and health, rather than purchasing behavior. Within the private sector, future studies, particularly those directed at informal and micro-enterprises, could help elucidate implementation barriers to the provision of nutritious and safe foods for purchase.

8. Leverage Learnings from Current Programming

The current review drew on high-quality peer-reviewed literature in the public domain. As highlighted throughout this study, increasing demand must go hand-in-hand with boosting supply to ensure access, affordability, and sustainability.

However, there is a need to consolidate and leverage learnings from current Feed the Future programming, including but not limited to extending current food supply chain strategies for cash or staple crops to incentivize and promote demand to nutritious foods (e.g., with a specific focus on fruits and vegetables, traditional and Indigenous crops).

POTENTIAL OPPORTUNITIES FOR USAID

Public and private sectors have a critical role to play in seeking to influence food purchases and other food choices, particularly in increasing demand for healthy and safe diets. To this end, there exists a window of opportunity for holistic approaches to increase demand for healthy diets.

This includes the scaling of social protection subsidy programs; derisking investments for MSMEs and technical training that are linked to markets; adoption and enforcement of regulations on marketing and labeling of foods and beverages high in saturated fats, trans fats, free sugars, or salt within markets and in schools; and promoting nutritious foods through mass media campaigns and public food procurement. Crucially, measures must be locally tailored to be effective, as countries are at different stages of economic and food systems development, which shape opportunities for transformative change.

The evidence on effective interventions identified in the literature reviewed in this report suggests several opportunities that USAID could consider pursuing. Each opportunity should be assessed in the context of USAID's Multi-Sectoral Nutrition Strategy and operations to determine its relevance and feasibility for USAID.

1. Multi-Sectoral Actions

Both the measurement and implementation of multi-sectoral actions is required to develop a whole-of-government approach for healthy and safe diets across the supply–demand continuum, to track progress, as well as to understand co-benefits and trade-offs across sectors. However, to date, few Feed the Future countries have conducted a landscape assessment of current policies, including the identification and prioritization of policies and multi-sectoral actions for the creation of nutritious food environments. This stocktaking will help identify gaps in policy and programmatic activities and allow for opportunities to promote and strengthen coordinated planning and programming with multi-sectoral stakeholders across food systems as well as geographic convergence of multi-sectoral interventions. USAID could encourage programs to pair supply-side interventions with strategies to stimulate and sustain demand for nutritious foods. For example, linking subsidies and transfers to local food systems by prioritizing support for MSMEs will reduce food loss, ensure access and affordability, and promote nutritious food consumption.

2. Private Sector Approaches

Private sector engagement in efforts to increase the demand for nutritious foods is critical across businesses of all sizes and scope. There is an urgent need for the public sector to collaborate with businesses to invest in large-scale, continuous, and innovative efforts to improve the availability, accessibility, and safety of nutritious foods. This report focuses specifically on interventions targeting MSMEs. Opportunities to support MSMEs include developing incubator and accelerator programs, including co-investment grants and building capacity of local financial institutions that can help tailor and de-risk investments and innovations; building partnerships among smallholder farmers, retailers, and consumers; and sharing resources such as distribution hubs and locally sourced packaging. More evidence is needed on MSME interventions' ability to increase demand for nutritious food and bring promising innovations to the market faster, more safely, and in a cost-effective manner. There is opportunity for USAID to continue and expand on current programming to provide the networks, expertise, and technologies MSMEs need to develop a greater understanding of, and demand for, more diverse nutritious foods and to expand to new markets.

3. Public Sector Approaches

Strong country commitment and government leadership along with the active engagement of communities is required to encourage consumer demand for healthy diets. There is opportunity for USAID to advocate and support governments, civil society, and other stakeholders to leverage resources, promote coordinated actions, and advance country priorities around consumer demand for healthy diets. This includes supporting country policies and programs such as public procurement of nutritious foods (i.e., social protection platforms, school and institutional canteens/cafeterias), regulations on marketing and labelling of foods and beverages high in saturated fats, trans fats, free sugars, or salt, development of national food-based dietary guidelines, and implementation of subsidies or taxes.

4. Research that Fills Evidence Gaps

As this review suggests, there are evidence gaps on the impact of interventions on healthy diets beyond micronutrient status and anthropometry. Investment is needed in research within public and private spheres, especially related to multi-component interventions such as cash-plus and multi-component social and behavior change programs; the combined effect of taxes and subsidies; leveraging the Nutrition Friendly Schools Initiative; and supply and demand interventions for the private sector like the promotion of food safety across markets and households. Importantly, to truly achieve progress in demand interventions for healthy and safe diets, there must be an emphasis on research that highlights the interconnected nature of supply and demand to drive meaningful and sustainable change. Specific knowledge gaps for current nutritious commodity supply chains, including traditional and Indigenous crops, are related to marketing and branding, packaging, and improving local dishes and street foods.

5. Data Ecosystems & Novel Metrics

Novel consumer-demand metrics and consolidated publicly available data sources are needed to better understand the context-specific facilitators and barriers to healthy and safe diets across population groups. In particular, this review found an absence of metrics used within intervention or evaluation studies on drivers of food choice (e.g., socio-cultural, personal food environments, material assets and resources, person-state drivers) and food choice behaviors (e.g., intra-personal factors such as knowledge, attitudes, practices, preferences, time use). There is also potential to develop enhanced globally standardized national poverty lines that better account for local costs and affordability of healthy diets. The development and use of novel metrics could improve intervention design and evaluation. Policy and program design would also benefit from increased collection, analysis, and aggregation of data across the public and private sectors to develop a more complete understanding of the dynamics and linkages at play throughout local food systems. Linking public and private sector data could significantly improve knowledge of what interventions work, in which settings, why, and how they could be scaled. Such data would also facilitate tracking of national progress on healthy diets.

6. Targeted Monitoring, Evaluation & Learning

This review identified the need for more real-world evidence on demand interventions for healthy and safe diets for all population groups in LMICs. This includes independent and rigorous monitoring and assessment of approaches to generate demand for healthy diets, such as food-based dietary guidelines, locally tailored consumer subsidies, and restricting marketing of foods and beverages high in saturated fats, trans fats, free sugars, or salt —all notable gaps in the available evidence. In addition to more research on the effects of these approaches, there is also a need for cost-effectiveness studies, implementation studies, and impact modeling to provide policymakers, funders, implementers, and other actors with information to guide strategic planning, financial projections, and priority setting to address healthy diets at scale.

7. Exploration of New Food Environments

New food environments, including the digital food environment[159], are shaping food acquisition and consumption in ways that extend beyond the physical food environment and have implications for diets and nutrition. The literature reviewed highlighted the potential for digital food environments to positively disrupt the food supply by making it more productive, cost efficient, transparent, and agile. However, there is little evidence on the impact of new digital food environments on the demand for nutritious foods in LMICs. Specifically, new frameworks are required to understand and encourage potential positive impacts of the digital food environment and harness its potential to help consumers make nutritious food choices. Experts consulted for this review noted that policymakers would also benefit from increased understanding of national digital ecosystems, the impact of youth exposure to digital advertisements for foods and beverages high in saturated fats, trans fats, free sugars, or salt, and best practices for promoting positive digital food environments.

[159] Digital food environments are the online settings through which flows of services and information that influence people's food and nutrition choices and behaviors are directed. They encompass a range of elements, including social media, digital health promotion interventions, digital food marketing and online food retail (World Health Organization).

ANNEX 1: LITERATURE REVIEW METHODS

This research was undertaken in three stages:

Phase 1: Systematic or scoping reviews

An initial search of systematic and scoping reviews of eligible interventions was conducted to collate already-existing, high-quality evidence. This allowed for the identification of evidence gaps or areas that could benefit from additional searching as delineated in Phase 2 (a search of individual high-quality primary studies including programmatic evaluations).

Phase 2: Individual high-quality primary studies, including programmatic evaluations

A search of individual high-quality primary studies assessing interventions, including program evaluations, was conducted as a supplement to Phase 1. This phase explored existing primary research for areas of interest where systematic reviews and/or meta-analyses are lacking. This phase also ensures high-quality, primary interventional studies or programs are included and highlighted, using the criteria listed in Table 1.

Phase 3: High-level reports

A search of recent high-level reports that provide key evidence gaps and recommendations for future research.

Search Strategy

A comprehensive search of the literature was conducted from the year 2000 onwards using the following databases:

- Medline
- Web of Science
- Scopus

To ensure maximum coverage of unpublished literature, and reduce the potential for publication bias, the authors searched the following organizational websites and databases using keyword searches for unpublished grey literature in health, health promotion, and nutrition:

- eLENA (WHO e-Library of Evidence for Nutrition Actions)
- International Initiative for Impact Evaluation (3ie)
- World Obesity
- International Food Policy Research Institute (IFPRI)
- Food and Agriculture Organization (FAO)
- World Bank
- International Network for Food and Obesity Research, Monitoring and Action Support (INFORMAS)
- IMMANA
- Food Forward NDCs
- Global Alliance for the Future of Food Alliance for Improved Nutrition

Table 1. Eligibility Criteria for Included Reviews and Studies

	Inclusion	Exclusion
Population	Individuals and households, with prioritization of vulnerable groups (e.g., women of reproductive age and children) LMIC setting, according to the World Bank, especially Feed the Future countries	High income countries, according to World Bank classification
Methodology	Systematic reviews of individual studies or of reviews (umbrella reviews) of eligible interventions reporting quantified outcomes with or without meta-analysis, that predominantly (>50%) include studies with designs that allow causal inference of the impact of interventions on outcomes such as: • Randomized Controlled Trials (RCTs) • Non-Randomized Controlled Trials (NRCTs) • Controlled Before-After (CBA) studies • Interrupted-time-series (ITS) • Repeated Measures Studies (RMS)	
Intervention	Single component and multicomponent food environment interventions or programs which relate to: • Food availability • Food accessibility • Food marketing and promotion • Food safety • Food pricing	
Comparator	Populations that receive no intervention or program, those who receive the standard of care or business as usual.	
Outcomes of interest	Primary Outcomes: • Direct measures of consumption • Diet quality • Share of total expenditure on food • Share of food expenditure on non-staples Secondary Outcomes: • Food security • Anthropometric outcomes • Diet-related health outcomes	

Types of Interventions

This review included behavioral and environmental interventions, both preventive and curative, targeting individuals and households, particularly vulnerable populations including women and children in LMICs, which are conducted at the market, school, or household level. Behavior change interventions, in the context of the food environment, foster knowledge and awareness on nutrition and are delivered through health promotion and communication strategies, including single and multi-component nutrition education interventions. Several theories and models of behavioral change such as theory of planned behavior, behavioral theory of the firm, diffusion of innovation theory, the social cognitive theory, and the health belief model offer insight into the behavioral relationship between food environment interventions on diets and diet-related health outcomes. In contrast, environmental interventions target the various spheres of an individual's environment that influence their choice in food and beverages. These include structural modifications of the built environment, pricing, advertising, and availability of food items.

Types of Outcomes

Food environment interventions and their effect on primary and secondary outcomes were prioritized throughout this umbrella review.

Primary Outcomes

1. Direct measures of consumption

- Frequency of Consumption
- Energy Intake
- Macronutrient and Micronutrient Intake
- Food Group Intake
- Food Consumption Score

2. Diet quality

- Diet Diversity Score (including Minimum Dietary Diversity for Women)
- Meal Score
- Healthy Eating Index
- Other Diet Quality Indices
- Diet Adequacy

3. Share of total expenditure on food

4. Share of food expenditure on non-staples

Secondary Outcomes

1. Food security

2. Anthropometric outcomes

- Height (including stunting)
- Weight (including wasting)
- Body composition
- Mid-upper-arm circumference

3. Diet-related health outcomes

- Micronutrient deficiencies
- Type 2 Diabetes
- Hypertension
- Biomarkers of micronutrient deficiencies

Duration of Follow-up

The authors did not include or exclude reviews or studies based on duration of follow-up. If studies had multiple follow-ups, they included the outcome measures most like that presented in the other studies included in any single meta-analysis and reported any additional follow-ups narratively.

Types of Settings

The authors included studies assessing an intervention in any LMIC setting, as defined by the World Bank, as long as all other inclusion criteria were met. They included studies conducted at the household, school, or community level (including out-of-school childcare). The World Bank provides a comprehensive list of all the countries falling under the LMIC definition.

ANNEX 2: ROUNDTABLE KEY MESSAGES

The following non-attributable points were shared by speakers invited to participate in a virtual roundtable on July 31, 2024. The discussion was hosted by the Board for International Food and Agricultural Development (BIFAD) in collaboration with the U.S. Agency for International Development (USAID). The messages below have been edited for clarity and tone.

Opening Remarks

- One of BIFAD's four work streams focuses on nutrition, specifically on the availability of safe and affordable nutritious foods. BIFAD is concentrating on the demand side for nutritious foods, looking at evidence on interventions and approaches to increase the sale, distribution, purchase, and consumption of nutritious foods.
- Nutrition is central to development. A healthy, nutritious diet is essential to the achievement of nearly all development goals, from eradicating poverty to preventing maternal and child deaths to providing a foundation for economic growth. The climate crisis is a nutrition crisis.
- BIFAD will deliberate on the feasibility, trade-offs, and potential outcomes of a series of actions USAID could take to increase demand for safe, nutritious food. This will lead to formal recommendations about policies, programs, and market-based approaches the Agency could undertake to achieve this goal.
- Demand is not just at the individual or household level. Demand for novel foods or more diverse production must also come from the private sector, from companies that purchase foods and transform them into processed foods that make up the bulk of diets in many parts of the world today.

> *If we are going to achieve demand for healthy, diverse, safe diets, more must be done beyond agricultural growth.*

- Most of the world is now urban and there are by far more consumers than producers of food in the world, but we are all talking about rural consumers knowing that even smallholder farmers are net purchases of food.
- Food environments and food markets are changing rapidly, even in the remotest areas of the world.
- We need to learn from existing evidence, as well as evidence to be collected, to help guide USAID in doing things differently to support the demand side and connect it to the supply side.

Plenary Discussion

Policy

- Taxes on sugar sweetened beverages (SSB) are a regressive tax, which have a disproportionate impact on lower socioeconomic groups.
- The revenue collected from SSB taxes could be invested in initiatives that benefit households with lower income. SSB taxes are not necessarily regressive as studies have found that their effects, as well as the health care gains they generate, could be progressive.
- Front of package labeling should be voluntary versus mandated.
- It is important to integrate taxation and subsidies for nutritious food.
- Consider government – local as well as federal – as an institution that can create demand through public procurement.
- Focus on a reduction of food loss and waste, especially in nutritious agricultural products, as a policy area.

Interventions

- To achieve healthy diets, flip the focus to think about demand over supply. Shape the demand early so that supply meets demand and not the other way around. How and where food is grown could be informed by patterns of demand that need to shift.
- Facilitate more thought leadership on demand for healthy diets across all levels: government, food companies, and the household. Go beyond the benefits of breastfeeding or dietary guidelines; get granular.
- Evidence on the sustainability of nutrition behavior change is slim.
- Consider all the determinants of choice beyond affordability. Stop assuming people do not know what's good for them. Determinants of choice can relate to political economy concerns, time poverty, taste, cultural habits, etc. Do not accept those as constraints; tackle them one by one using technological and marketing innovations.
- It is important to look at the role of continued financing and investments in systems that focus on the demand side.
- What is the evidence of the differential impact when integrating multiple interventions?
- The public procurement space is a mechanism that can unlock the space for the private sector, but this is outside of USAID's traditional programmatic interventions.
- We need good information, coupled with innovation in the digital age, that can be the basis for engagement and communication. Messages are currently being drowned out by the private sector, which is more about advertising and marketing of products that are not always appropriate or healthy.
- There are many more tools to decrease consumption of unhealthy foods than there are tools to increase consumption of nutritious foods.
- Could a convergence of policies help with integration of interventions?

Demand creation for healthy diets can happen at the household, private sector, and government levels. USAID must work in partnership with many actors on many activities to make an impact.

Social Media Influence

- Need to counter unfounded claims on social media that foster fear on food safety. Need evidence of real risks.

USAID Role

- Approach USAID's role through a rigorous lens of feasibility and practicality: what can USAID do *specifically*?
- Do more at the market and retail level, taking advantage of USAID's private sector partnerships.
- Look at the display voucher promotional campaign created by the Access to Nutrition Initiative and GAIN that had health star rating and specific levers.

Private Sector

- Pair local SMEs with local colleges or universities that understand the cultural context to help with research innovation.
- Work with food companies on negative and positive marketing.
- Packaging can be a huge add-on cost. How can packaging be less expensive and be done locally?
- There is a need to support consumer research to help the private sector determine what will work or if there would be resistance to reformulation.

Country Context

- We need more research on population groups beyond women and children.
- Consider the profound impact of cultural norms, especially intrahousehold allocation of food, dynamics of labor and workload, and the role of gender. Women are bearing almost the entire burden of feeding their families. Any critical strategy on healthy diets needs to focus on lifting the burden on women.
- The country context shapes the way people eat (i.e. traditional wet market street foods in Southeast Asia). It influences nutrition and food safety.

Breakout Group 1: Public Sector Role

Behavior Change

- Increase public investments for behavior change campaigns that influence consumer demand.
- Consumers' perceptions, specifically related to chemicals in food and food safety, are influenced by social media. Media literacy and the role of social media in behavior change should be factored into interventions. In addition, data needs to be collected on food safety risks to combat misinformation on social media.
- In terms of affordable diets, behavior change approaches need to include approaches to household budgeting. The financial aspect of healthy diets is not just related to money, but also to time and labor restrictions, especially the role of gender and greater burden on women.
- Increase public investments in food science research because of the importance that consumers place on taste and consider cultural context. If food does not taste good, it does not matter how healthy or cheap it is, people will not consume it.

Role of Government

- Governments should focus on regulating harmful marketing. Governments should be empowered, resourced, and supported to implement policies that restrict what can be marketed.

- Focus more on the role of digital marketing, as the private sector can currently bypass many government controls and monitoring systems. Governments need access to the data that show what needs to be monitored, even if they can successfully pass marketing policies.
- Government mandates should be explored. We need both bottom-up and top-down interventions to address consumer and government driven demand.
- Include regulations on placement of nutritional products.

Approach

- Given the complexity of the food system, explore all opportunities with multiple actors, actions, and platforms engaged. This is called double duty policy bundles (i.e. need to tax and need to subsidize). Create a comprehensive package of interventions that target multiple levels.
- Youth need to be part of the solution. Children are powerful household influencers, pressuring parents to purchase processed foods over traditional nutritious foods and shifting the diets of families. Focus on interventions that can effectively change the food consumption behavior of children and foster lifelong healthy eating habits, such as school-based nutrition education, healthy school meals, parental involvement, and positive reinforcement.
- USAID could ramp up programming that improves access to finance and manages food safety controls for SMEs.
- One impediment to a demand creation activity is a food environment that is not responsive to demand creation. That's where connections can be made. Address infrastructure and affordability.
- Consider the out-of-home environment that is critical to improving household diets (i.e. street vendors). Moving toward incentivizing healthy outlets is key.
- There needs to be a greater focus on hygiene practices and sanitation (WASH). Consumers assume that if it is packed, it is healthy.
- Addressing comprehensive water security could potentially influence food choices and improve dietary diversity. How does water security, beyond WASH, impact consumer demand? Water is essential not only for safe drinking and hygiene, but also for cooking, food preparation, and cleaning. Inadequate water access can limit the ability to prepare nutritious meals and increase women's workload, affecting household nutrition and food safety.
- A gendered view of what enables food preparation within homes would help us deepen understanding of drivers of dietary choice and of relevant actions that could actively influence those drivers.
- Expand the players within the movement toward a healthy diet, i.e. famous chefs.

Economy

- Acknowledge the power and sensitivities of commercial marketing of foods and beverages high in saturated fats, trans fats, free sugars, or salt, particularly by companies in the United States, and its global impact on demand.
- Perhaps there must be a competitiveness of supply to drive the price down and make a product affordable, especially locally made products.
- Market affordability is important and needs to align with demand creation.

Localization, Country Context

- To make a significant impact, interventions need to look at local market analytics and reach out to communities. Get a model that works at a smaller level of community, then scale. USAID should work more directly with local government partners.
- USAID needs to look at the local level, take a multisectoral approach, and bring in WASH, health, and agriculture.
- There is a huge informal sector in Feed the Future priority countries. Interventions like labeling and taxation will not necessarily reach everyone in these countries.
- We must focus on the 500 million smallholder producers in developing countries who only consume what is produced, which is not always healthy. Smallholders are also in need of safe, nutritious diets. We are ignoring a large segment of humanity if we do not address them.

Breakout Group 2: Private Sector Role

Overall Environment

- There are more tools available to decrease the consumption of foods and beverages high in saturated fats, trans fats, free sugars, or salt than there are tools to increase the consumption of nutritious foods.
- We are working against the tide.
- SMEs play a crucial role.

Evidence Base

- There is a lack of evidence on the marketing side.
- We need evidence on building market chains and lessons learned seen through the lens of feasibility and practicality.

Specific Market-Based Approaches USAID Could Support

- Retail level: support in-store displays.
- Support promotional campaigns for nutritious foods (there are not billboards for leafy greens).
- Support food vouchers.
- Support product labeling (see work of ATNI and GAIN; Health Star rating).
- Consumer research on product appeal, including looking at the convenience factor.

Other areas that would benefit from investment by USAID, as it is not economically feasible for individual companies to take on:

- Packaging is too expensive for individual companies to take on for their own products, especially for products that go to rural areas where food stability and food safety are real issues. Packaging can add up to 50 percent of overall costs. USAID should look at how to make packaging cheaper and locally made.
- Distribution costs are a huge driver of costs in rural areas. USAID should look at how to reduce distribution costs, such as through hub models

USAID investment can help offset high costs of packaging and distribution to enable individual companies to increase production and sale of nutritious foods.

ANNEX 3: THE NOURISHING FRAMEWORK

Type	Intervention Area *	Examples
Environmental interventions		
Labeling interventions	Nutrition label standards and regulations on the use of claims and implied claims on foods	Nutrient lists on food packages, front-of-pack traffic-light-labeling, shelf and menu board calorie labels
Nutrition standards in public institutions	Offer healthy foods and set standards in public institutions and other specific settings	School nutrition policies, nutrition standards in health facilities
Economic tools	Use economic tools to address food affordability and purchase incentives	Targeted subsidies, price promotions at point of sale, health-related food taxes
Advertisement regulation	Restrict food advertising and other forms of commercial promotion	Restrictions on advertising to children that promotes unhealthy diets
Whole food supply interventions	Improve the nutritional quality of the whole food supply	Reformulation to reduce sugar content and energy density of processed foods, portion size limits
Retail and food service interventions	Set incentives and rules to create a healthy retail and food service environment	Incentives for shops to locate in underserved areas, planning restrictions on food outlets, in-store promotions
Action across sectors	Harness the food supply chain and actions across sectors to ensure coherence with health	Health-in-all policies, governance structures for multi-sectoral engagement
Behavioral interventions		
Awareness raising interventions	Inform people about food and nutrition through public awareness	Dissemination of dietary guidelines, public information campaigns
Counseling interventions	Nutrition advice and counseling in healthcare settings	Nutrition advice for at-risk individuals, guidelines for health professionals on nutrition interventions
Skill-building interventions	Give nutrition education and skills	Cooking skills on education curricula, health literacy programs
		**wording used in the NOURISHING framework*

ANNEX 4: EVIDENCE REVIEW BIBLIOGRAPHY

This annex lists the publications included in the evidence review, based on the inclusion criteria described in the methodology section of this report.

Key Reviews

MULTI-SETTING STUDIES

This section describes reviews that examine interventions that are delivered through various settings (schools, communities, markets) and levels (macro-, meso- or micro- level).

Burgaz, C.; Gorasso, V.; Achten, W.M.J. et al. (2023). The effectiveness of food system policies to improve nutrition, nutrition-related inequalities and environmental sustainability: a scoping review. Food Sec. 15, 1313–1344.

Downs, S. & Demmler, K. M. (2020). Food environment interventions targeting children and adolescents: A scoping review. Global Food Security, 27.

Mayén, A.L.; de Mestral, C.; Zamora, G.; Paccaud, F.; Marques-Vidal, P.; Bovet, P.; Stringhini, S. (2016). Interventions promoting healthy eating as a tool for reducing social inequalities in diet in low- and middle-income countries: a systematic review. Int J Equity Health 15(1):205.

Neufeld, L.M.; Nordhagen, S.; Leroy, J.L.; Aberman, N-L; Barnett, I.; Wouabe, E.D.; et al. (2024). Food systems interventions for nutrition: Lessons from six program evaluations in Africa and South Asia. Journal of Nutrition 154(6).

Storhaug, I.G.; Lane, C.; Moore, N.; Engelbert, M.; Sparling, T.M.; Snilstveit, B. (2022). Making the most of existing research: an evidence gap map of the effects of food systems interventions in low-income and middle-income countries. BMJ Open; 12(6): e055062. doi: 10.1136/bmjopen-2021-055062. Erratum in: BMJ Open. 2023 Jan 20;13(1): e055062corr1.

POPULATION AND MARKET-LEVEL STUDIES

This section describes reviews that examine interventions that are delivered at the population- or market-level. Some examples of these types of interventions include taxation on unhealthy food and drink items like sugar-sweetened beverages, food subsidies and vouchers, cash transfers, and interventions to reduce dietary sodium in food products.

Alagiyawanna, A.; Townsend, N.; Mytton, O.; Scarborough, P.; Roberts, N.; Rayner, M. (2015). Studying the consumption and health outcomes of fiscal interventions (taxes and subsidies) on food and beverages in countries of different income classifications; a systematic review. BMC Public Health; 15:887.

Bastagli, F.; Hagen-Zanker, J.; Harman, L.; Barca, V.; Sturge, G.; Schmidt, T. (2019). The impact of cash transfers: a review of the evidence from low-and middle-income countries. Journal of Social Policy, 48(3), 569-594.

Durão, S.; Visser, M.E.; Ramokolo, V.; Oliveira, J.M.; Schmidt, B.M.; Balakrishna, Y.; Brand, A.; Kristjansson, E.; Schoonees, A. (2020). Community-level interventions for improving access to food in low- and middle-income countries. Cochrane Database Syst Rev. 2020 Jul 28;7(7):CD011504.

Global Alliance for Improved Nutrition (2020). Food Safety Interventions in Africa and Asia: A Review of studies relevant to traditional markets in low-resource settings. A USAID EatSafe Project Report.

Global Alliance for Improved Nutrition (2022). Business Models for Reaching Lower-Income Consumers With Nutritious Foods.

Hammaker, J.; Anda, D.; Kozakiewicz, T.; Bachina, V.; Berretta, M.; Shisler, S.; Lane, C. (2022). Systematic review on fiscal policy interventions in nutrition. Frontiers in Nutrition, 9, 967494.

Haynes, E.; Augustus, E.; Brown, C.R.; Guell, C.; Iese, V.; Jia, L.; Unwin, N. (2022). Interventions in Small Island Developing States to improve diet, with a focus on the consumption of local, nutritious foods: a systematic review. BMJ Nutrition, Prevention & Health, 5(2), 243.

Little, Madison T. et al. Effectiveness of cash-plus programmes on early childhood outcomes compared to cash transfers alone: A systematic review and meta-analysis in low-and middle-income countries. PLoS Medicine 18.9 (2021): e1003698.

McLaren, L.; Sumar, N.; Barberio, A.M.; Trieu, K.; Lorenzetti, D.L.; Tarasuk, V.; Webster, J.; Campbell, N.R.C. (2016). Population-level interventions in government jurisdictions for dietary sodium reduction. Cochrane Database of Systematic Reviews 2016, Issue 9. Art. No.: CD010166. DOI: 10.1002/14651858.CD010166.pub2.

Nakhimovsky, S.S.; Feigl, A.B.; Avila, C.; O'Sullivan, G.; Macgregor-Skinner, E. et al. (2016). Taxes on Sugar-Sweetened Beverages to Reduce Overweight and Obesity in Middle-Income Countries: A Systematic Review. PLOS ONE 11(9): e0163358.

Olney, D.K.; Gelli, A.; Kumar, N.; Alderman, H.; Go, A.; Raza, A. (2022). Social assistance programme impacts on women's and children's diets and nutritional status. Matern Child Nutr.18(4): e13378.

Von, Philipsborn P.; Stratil, J.M.; Burns, J.; Busert, L.K.; Pfadenhauer, L.M.; Polus, S.; Holzapfel, C.; Hauner, H.; Rehfuess, E. (2019). Environmental interventions to reduce the consumption of sugar-sweetened beverages and their effects on health. Cochrane Database of Systematic Reviews 2019, Issue 6. Art. No.: CD012292. DOI: 10.1002/14651858.CD012292.pub2. Accessed 10 July 2024.

COMMUNITY AND HOUSEHOLD-LEVEL STUDIES

This section describes reviews that evaluate interventions delivered at the community- or household-levels (involving the parents and/or caregivers, families, etc.). Most of these interventions include education or behavior change components.

Graziose, M.M.; Downs, S.M.; O'Brien, Q.; Fanzo, J. (2018). Systematic review of the design, implementation and effectiveness of mass media and nutrition education interventions for infant

and young child feeding. Public Health Nutr.; 21(2):273-287. doi: 10.1017/S1368980017002786. Epub 2017 Oct 30. PMID: 29081315; PMCID: PMC10260785.

Litvin, K.; Grandner, G.W.; Phillips, E.; Sherburne, L.; Craig, H.C.; Phan, K.A.; Patel, A.N.; Dickin, K.L. (2024). How Do Social and Behavioral Change Interventions Respond to Social Norms to Improve Women's Diets in Low- and Middle-Income Countries? A Scoping Review. Current Developments in Nutrition, 8(6).

Watson, D.; Mushamiri, P.; Beeri, P.; Rouamba, T.; Jenner, S.; Proebstl, S.; Kehoe, S.H.; Ward, K.A.; Barker, M.; Lawrence, W. (2023). INPreP Study Group. Behaviour change interventions improve maternal and child nutrition in sub-Saharan Africa: A systematic review. PLOS Glob Public Health. 30;3(3): e0000401.

Webb, G.A.; Waugh, E.; Sawyer, S.; Golding, L.; Ramakrishnan, U. (2019). A scoping review of social behaviour change techniques applied in complementary feeding interventions. Maternal Child Nutr. 2020 Jan;16(1): e12882. doi: 10.1111/mcn.12882.

SCHOOL-LEVEL STUDIES

This section describes reviews that are implemented in a school setting. Commonly, school-based interventions are multi-component involving dietary, physical activity and educational components. Another large group of interventions that influence consumption are feeding programs (e.g. school meal program, snack provision). majority of these interventions are feeding programs or involve a feeding component (e.g. school meal program, snack provision).

Durão, S.; Wilkinson, M.; Davids, E.L.; Gerritsen, A.; Kredo, T. Effects of policies or interventions that influence the school food environment on children's health and non-health outcomes: a systematic review. Nutr Rev. 2024 Feb 12;82(3):332-360.

Jomaa, L.H.; McDonnell, E.; Probart C. (2011). School feeding programs in developing countries: impacts on children's health and educational outcomes. Nutrition reviews 69.2 (2011): 83-98.

Kachwaha, S.; Kim, S.; Das, Jai K.; Rasheed, S.; Gavaravarapu, S.M.; Rana, P.P.; Menon, P. Behavior change interventions to address unhealthy food consumption: A scoping review. Current Developments in Nutrition 8(3): 102104.

Klingberg, S.; Draper, C.E.; Micklesfield, L.K.; Benjamin-Neelon, S.E.; van Sluijs, E.M.F. (2019). Childhood Obesity Prevention in Africa: A Systematic Review of Intervention Effectiveness and Implementation. Int J Environ Res Public Health. 2019 Apr 4;16(7):1212.

Verstraeten, R.; Roberfroid, D.; Lachat, C.; Leroy, J.L.; Holdsworth, M.; Maes, L.; Kolsteren, P.W. (2012). Effectiveness of preventive school-based obesity interventions in low- and middle-income countries: a systematic review. American Journal of Clinical Nutrition 2012; 96(2): 415-438.

Key Primary Studies

The following intervention studies or program evaluations were found through the prioritized reviews and reports. These studies and evaluations were identified due to their effectiveness and relevance to USAID Feed the Future and Nutrition Priority countries.

POPULATION AND MARKET-LEVEL INTERVENTIONS

Baker, P.; Friel, S.; Schram, A.; Labonte, R. (2016). Trade and investment liberalization, food systems change and highly processed food consumption: A natural experiment contrasting the soft-drink markets of Peru and Bolivia. Globalization and Health 2016;12(1):1-13.

Even, B.; Crawford, S.; Shittu, O.F.; Lundy, M.; Wertheim-Heck, S.; Folake, O.S.; Talsma, E. F.; Pastori, G.; Le, T.H.; Hernandez, R.; Brouwer, I.D.; Béné, C. (2024). From streets to tables: bottom-up cocreation case studies for healthier food environments in Vietnam and Nigeria. Current Developments in Nutrition. https://doi.org/10.1016/j.cdnut.2024.104395

Kim, S.S.; Nguyen, P.H.; Tran, L.M.; Alayon, S.; Menon, P.; Frongillo, E. A. (2020). Different combinations of behavior change interventions and frequencies of interpersonal contacts are associated with infant and young child feeding practices in Bangladesh, Ethiopia, and Vietnam. Current Developments in Nutrition, 4(2), nzz140. https://doi.org/10.1093/cdn/nzz140

Miller, L.C.; Neupane, S.; Joshi, N.; Lohani, M. (2024). A multi-sectoral community development intervention has a positive impact on diet quality and growth in school-age children in rural Nepal. Maternal and Child Nutrition 20(3). First published online March 15, 2024. https://doi.org/10.1111/mcn.13637

Schram, A.; Labonte, R.; Baker, P.; Friel, S.; Reeves, A.; Stuckler, D. (2015). The role of trade and investment liberalization in the sugar-sweetened carbonated beverages market: a natural experiment contrasting Vietnam and the Philippines. Globalization and Health; 11(1):1-13.

SMEs and Public-Private Partnerships

Danse, M.; Klerkx, L.; Reintjes, J.; Rabbinge, R.; Leeuwis, C. (2020). Unravelling inclusive business models for achieving food and nutrition security in BOP markets. Global Food Security, 24, 100354. https://doi.org/https://doi.org/10.1016/j.gfs.2020.100354

FAO and IFPRI (2021). Approaches for the Leveraging of Small and Medium Enterprises to Improve Nutrition. A Net-Map Assessment of Actors and Activities in Ghana. Rome: FAO. https://nutritionconnect.org/media/120.

Henson S. and Agnew J. (2021). Are market-based solutions a viable strategy for addressing micronutrient deficiency? Lessons from case studies in sub-Saharan Africa and South Asia. Development Policy Review 39.

Hoddinott, J.; Gillespie, S.; Yosef, S. Public-Private Partnerships and the Reduction of Undernutrition in Developing Countries (2015). IFPRI Discussion Paper 1487, Available at SSRN: https://ssrn.com/abstract=2741274 or http://dx.doi.org/10.2139/ssrn.2741274

Lybbert, T.J.; Nordhagen, S.; Vosti, S.A.; Neufeld, L.M. (2024). Improving Nutrition through Blended Finance and Impact Investing in Small and Medium Enterprises in sub-Saharan Africa. Applied Economic Perspectives and Policy 46(2): 456–474. https://doi.org/10.1002/aepp.13418

Maredia, M.K.; Porter, M.; Nakasone, E.; Ortega, D.L.; Caputo, V. (2024). Does Increasing the Availability of a Nutritious Food Produced by a small- and Medium-Sized Enterprise Increase Its Consumption? Evidence from a Field Experiment in Kenya. Applied Economic Perspectives and Policy 46(2): 414–434. https://doi.org/10.1002/aepp.13402

Maestre, M. and Poole N. (2018). Value Chains for Nutrition in South Asia: Who Delivers, How, and to Whom? IDS bulletin, Volume 49.

Mekonnen, D.A; Termeer, E.; Soma, K.; van Berkum, S.; de Steenhuijsen Piters, B. (2022). How to Engage Informal Midstream Agribusiness in Enhancing Food System Outcomes: What We Know and What We Need to Know Better. Wageningen: Wageningen Economic Research, Working Paper 2022-034.

PATH et al. (2019) Where Business and Nutrition Meet: Review of approaches and evidence on private sector engagement in nutrition. MQSUN+ Report.

Marketing

Fretes, G.; Corvalán, C.; Reyes, M.; Taillie, L.S.; Economos, C.D.; Wilson, N.L.W.; Cash, S.B. (2023). Changes in children's and adolescents' dietary intake after the implementation of Chile's law of food labeling, advertising and sales in schools: a longitudinal study. International Journal of Behavioral Nutrition and Physical Activity 20:40. http://dx.doi.org/10.1186/s12966-023-01445-x

Ortega, D.L.; Caputo, V.; Maredia, M.K. (2022). Effectiveness of Nutritional Information in Increasing Demand for Enriched Yoghurt among Poor Households in Kenya: Implications for Agribusiness Marketing Strategies. Agribusiness 1–6: 285–290. https://doi.org/10.1002/agr.21784.

Food Transfers

Ahmed, A.; Hoddinott, J.F.; Roy, S. (2019). Food Transfers, Cash Transfers, Behavior Change Communication and Child Nutrition: Evidence from Bangladesh. International Food Policy Research Institute (IFPRI), Washington, DC. https://doi. org/10.2499/p15738coll2.133420. IFPRI Discussion Paper 1868.

Bliss, J.; Golden, K.; Bourahla, L.; Stoltzfus, R.; Pelletier, D. (2018). An emergency cash transfer program promotes weight gain and reduces acute malnutrition risk among children 6-24 months old during a food crisis in Niger. J Glob Health; 8(1):010410. doi: 10.7189/jogh.08.010410. PMID: 29497505; PMCID: PMC5825977.

Field, E.M. and Maffioli, E.M. (2021). Are Behavioral Change Interventions Needed to Make Cash Transfer Programs Work for Children? Experimental Evidence from Myanmar. National Bureau of Economic Research Working Paper 28443. https://doi.org/10.3386/w28443.

Gelli, A.; Aberman, N.L.; Margolies, A.; Santacroce, M.; Baulch, B.; Chirwa, E. (2017). Lean-season food transfers affect children's diets and household food security: evidence from a quasi-experiment in Malawi. J. Nutr. 147 (5), 869–878. https://doi. org/10.3945/jn.116.246652.

Hoddinott, J. and Wiesmann, D. (2008). The Impact of Conditional Cash Transfer Programs on Food Consumption in Honduras, Mexico, and Nicaragua. Available at SSRN: https://ssrn.com/abstract=1269417 or http://dx.doi.org/10.2139/ssrn.1269417

Kusuma, D.; McConnell, M.; Berman, P.; Cohen, J. (2017). The impact of household and community cash transfers on children's food consumption in Indonesia. Prev. Med. 100, 152–158. https://doi.org/10.1016/j.ypmed.2017.04.020.

Leroy, J.L.; Gadsden, P.; Rodríguez-Ramírez S.; de Cossío, T.G. (2010). Cash and in-kind transfers in poor rural communities in Mexico increase household fruit, vegetable, and micronutrient consumption but also lead to excess energy consumption. J Nutr.140(3):612-7.

In-store Incentives and Subsidies

Aguilar, A.; Gutierrez, E.; Seira, E. (2017). The effectiveness of sin food taxes: evidence from Mexico. The Latin American and Caribbean Economic Association (LACEA). Available from: http://www.enriqueseira. com/uploads/3/1/5/9/31599787/obesidad_24jul17_esb.pdf

Andalón, M. and Gibson, J. (2017). The 'soda tax' is unlikely to make Mexicans lighter: new evidence on biases in elasticities of demand for soda, IZA Discussion Papers, No. 1076. Available from: https://econpapers.repec.org/RePEc:wai:econwp:17/07

Colchero, M.A.; Molina, M.; Guerrero-López, C.M. (2017). After Mexico implemented a tax, purchases of sugar-sweetened beverages decreased and water increased: difference by place of residence, household composition, and income level. J Nutr.; 147(8):1552-1557.

Colchero, M.A.; Guerrero-López, C.M.; Molina, M.; Rivera, J.A. (2016). Beverage sales in Mexico before and after implementation of a sugar sweetened beverage tax. PLoS ONE; 11(9): e0163463. 55.

Colchero, M.A.; Rivera-Dommarco, J.; Popkin, B.M.; Ng S.W. (2017). In Mexico, evidence of sustained consumer response two years after implementing a sugar-sweetened beverage tax. Health Aff (Millwood); 36(3): 564-571. https://doi.org/10.1377/hlthaff.2016.1231 54.

Vohra, J. and Soni, P. (2016). Understanding dimensionality of children's food shopping behaviour in retail stores. Br. Food J. 118 (2) https://doi.org/10.1108/BFJ-03-2015- 0112

Reformulation

Supornsilaphachai, C. (2013). Evolution of salt reduction initiatives in Thailand: lessons for other countries in the South-East Asia Region. Regional Health Forum 2013;17(1):61-71.

COMMUNITY AND HOUSEHOLD-LEVEL INTERVENTIONS

Behavior Change Communication

Alam, A.; Chowdhury, M.; Dibley, M.J.; Raynes-Greenow, C. (2020). How Can We Improve the Consumption of a Nutritionally Balanced Maternal Diet in Rural Bangladesh? The Key Elements of the "Balanced Plate" Intervention. Int. J. Environ. Res. Public Health 2020, 17, 6289. https://doi.org/10.3390/ijerph17176289

Aubel, J.; Touré, I.; Diagne, M. (2004). Senegalese grandmothers promote improved maternal and child nutrition practices: the guardians of tradition are not averse to change. Social Science & Medicine, 59(5), 945-959. https://doi.org/https://doi.org/10.1016/j.socscimed.2003.11.044

Diamond-Smith, N.; Mitchell, A.; Cornell, A. et al. (2022). The development and feasibility of a group-based household-level intervention to improve preconception nutrition in Nawalparasi district of Nepal. BMC Public Health 22, 666. https://doi.org/10.1186/s12889-022-12980-w

Dozio, E.; Peyre, L.; Oliveau Morel, S.; Bizouerne, C. (2016). Integrated psychosocial and food security approach in an emergency context: Central African Republic. Intervention; 14:257–71

Kang, Y.; Kim, S.; Sinamo, S.; Christian, P. (2017). Effectiveness of a community-based nutrition programme to improve child growth in rural Ethiopia: A cluster randomized trial. Mat & child nutr. a;13: doi: 10.1111/mcn.12349

Katenga-Kaunda, L.Z.; Iversen, P.O.; Holmboe-Ottesen, G.; Fjeld, H.; Mdala, I.; Kamudoni, P.R. (2020). Dietary intake and processes of behaviour change in a nutrition education intervention for pregnant women in rural Malawi: a cluster-randomised controlled trial. Public Health Nutrition; 23:2345–54. doi: 10.1017/S1368980020000294

Ochieng, J.; Afari-Sefa, V.; Karanja, D.; Kessy, R.; Rajendran S.; Samali, S. (2018). How promoting consumption of traditional African vegetables affects household nutrition security in Tanzania. Renewable Agriculture and Food Systems; 33(2):105-115. doi:10.1017/S1742170516000508

Saaka, M.; Wemah, K.; Kizito, F.; Hoeschle-Zeledon, I. (2021). Effect of nutrition behaviour change communication delivered through radio on mothers' nutritional knowledge, child feeding practices and growth. Journal of Nutritional Science; 10: e44. doi: 10.1017/jns.2021.35

SCHOOL-LEVEL INTERVENTIONS

Costa, F.F.; Assis, M.A.; Gonzalez-Chica, D.; Bernardo, C.; Barros, M.V.; Nahas M.V. et al. (2014). Effect of school-based intervention on diet in high school students. Revista Brasileira de Cineantropometria & Desempenho Humano; 16:36-45.

De Villiers, A.; Steyn, N.P.; Draper, C.E.; Hill, J.; Gwebushe, N.; Lambert, E.V.; Lombard, C. (2016). Primary school children's nutrition knowledge, self-efficacy, and behavior, after a three-year healthy lifestyle intervention (HealthKick). Ethn. Dis., 26, 171–180.

Harrabi, I.; Maatoug, J.; Gaha, M.; Kebaili, R.; Gaha, R.; Ghannem, H. School-based intervention to promote healthy lifestyles in Sousse, Tunisia. Indian J. Community Med. 2010, 35, 94–99.

Jemmott, J.B., III; Jemmott, L.S.; O'Leary, A.; Ngwane, Z.; Icard, L.; Bellamy, S.; Jones, S.; Landis, J.R.; Heeren, G.A.; Tyler, J.C. (2011). Cognitive-behavioural health-promotion intervention increases fruit and vegetable consumption and physical activity among South African adolescents: A cluster-randomised controlled trial. Psychol. Health; 26, 167–185.

Jemmott, J.B., III; Zhang, J.; Jemmott, L.S.; Icard, L.D.; Ngwane, Z.; Makiwane, M. et al. (2019). Intervention increases physical activity and healthful diet among South African adolescents over 54 months: A randomized controlled trial. Journal of Adolescent Health; 65:139–46. doi: 10.1016/j.jadohealth.2019.01.027

Kebaili, R.; Harrabi, I.; Maatoug, J.; Ghammam, R.; Slim, S.; Ghannem, H. (2014). School-based intervention to promote healthy nutrition in Sousse, Tunisia. Int. J. Adolesc. Med. Health; 26, 253–258.

Maatoug, J.; Hmad, S.; Bhiri, S.; Nawel, Z.; Imed, H.; Lamia, B.; Hassen, G. (2015). Effects of a kindergarten-based intervention to promote healthy lifestyles: Quasi experimental study in Sousse, Tunisia. Clin. Res. Trials; 1, 38–43.

Maatoug, J.; Msakni, Z.; Zammit, N.; Bhiri, S.; Harrabi, I.; Boughammoura, L.; Slama, S.; Larbi, C.; Ghannem, H. (2015). School-based intervention as a component of a comprehensive community program for overweight and obesity prevention, Sousse, Tunisia, 2009–2014. Prev. Chronic Dis; 12, E160.

Steyn, N.P.; de Villiers, A.; Gwebushe, N.; Draper, C.E.; Hill, J.; de Waal, M.; Dalais, L.; Abrahams, Z.; Lombard, C.; Lambert, E.V. (2015). Did HealthKick, a randomised controlled trial primary school nutrition intervention improve dietary quality of children in low-income settings in South Africa? BMC Public Health; 15, 948.

Uys, M.; Draper, C.E.; Hendricks, S.; de Villiers, A.; Fourie, J.; Steyn, N.P. (2016). Impact of a South African School-based Intervention, HealthKick, on Fitness Correlates. Am. J. Health Behav; 40, 55–66.

School Meal Programs

Abizari, A.R.; Buxton, C.; Kwara, L.; Mensah-Homiah, J.; Armar-Klemesu, M.; Brouwer, I.D. (2014). School feeding contributes to micronutrient adequacy of Ghanaian schoolchildren. British Journal of Nutrition; 112(6):1019-1033. doi:10.1017/S0007114514001585

Gelli, A.; Aurino, E.; Folson, G.; Arhinful, D.; Adamba, C.; Osei-Akoto, I.; Masset, E.; Watkins, K.; Fernandes, M.; Drake, L.; Alderman, H. (2019). A school meals program implemented at scale in Ghana increases height-for-age during mid childhood in girls and in children from poor households: a cluster randomized trial. J. Nutr. 149, 1434–1442. https://doi.org/10.1093/jn/nxz079.

Ghodsi, D.; Omidvar, N.; Rashidian, A.; Eini-Zinab, H.; Raghfar, H.; Aghayan, M. (2018). Effectiveness of the national food supplementary program on children growth and nutritional status in Iran. Matern. Child Nutr. 14 (3), e12591 https://doi.org/ 10.1111/mcn.12591.

Recommendations from Reports

This section describes relevant reports that proposed key recommendations and priorities for action on transforming food systems, building healthy food environments and positively influencing consumption at the consumer-level.

Fan, S.; Headey, D.D.; Rue, C.; Thomas, T.S. (2021). Food systems for human and planetary health: Economic perspectives and challenges. Annual Review of Resource Economics 13: 131-156. https://doi.org/10.1146/annurev-resource-101520-081337

Fan, S. (2019). Achieving healthy and sustainable food environments for all. UNSCN Nutrition 44: 6-9. https://www.unscn.org/uploads/web/news/UNSCN-Nutrition44-WEB-version.pdf

Fanzo, J.; Rudie, C.; Sigman, I.; Grinspoon, S.; Benton, T.G.; Brown, M.E.; Covic, N.; Fitch, K.; Golden, C.D.; Grace, D.; Hivert, M.F.; Huybers, P.; Jaacks, L.M.; Masters, W.A.; Nisbett, N.; Richardson, R.A.; Singleton, C.R.; Webb, P.; Willett, W.C. (2022). Sustainable food systems and nutrition in the 21st century: a report from the 22nd annual Harvard Nutrition Obesity Symposium. Am J Clin Nutr.; 115(1):18-33. doi: 10.1093/ajcn/nqab315. PMID: 34523669; PMCID: PMC8755053.

Global Panel on Agriculture and Food Systems for Nutrition (2016). Food systems and diets: Facing the challenges of the 21st century. London, UK. http://glopan.org/sites/default/files/ForesightReport.pdf

Food and Agricultural Organization [FAO] (2024). Small and medium enterprises and nutrition: understanding linkages, seizing opportunities – Discussion paper. Rome. https://doi.org/10.4060/cd0056en

Global Panel (2018). Improving diets in an era of food market transformation: Challenges and opportunities for engagement between the public and private sectors. Policy Brief No. 11. London, UK: Global Panel on Agriculture and Food Systems for Nutrition. https://glopan.org/sites/default/files/Downloads/GlobalPanelPrivateSectorBrief.pdf

Hawkes, C.; Walton, S.; Haddad, L.; Fanzo, F. 42 Policies and Actions to Orient Food Systems Towards Healthier Diets for All. Available at: https://www.foodsystemsdashboard.org/resources/publication-42.pdf

Herforth, A. (2016). Impact assessment of policies to support healthy food environments and healthy diets.

Richardson, L.; Sessions, N.; Bush, A. (2024). Exploring new, evolving and neglected topics at the intersection of food systems, climate change and nutrition: A literature review. Emergency Nutrition Network (ENN); https://doi.org/10.6084/ m9.figshare.25112246

Sacks, G.; Swinburn, B.; Kraak, V.; Downs, S.; Walker, C.; Barquera, S. (2013). A proposed approach to monitor private-sector policies and practices related to food environments, obesity and non-communicable disease prevention. Obesity reviews; 14, 38-48.