

# Food Systems and Nutrition E-Consultation

## Emerging Evidence Research Opportunities

### I. Summary

#### Background

The USAID Bureau for Food Security (BFS) has prioritized a need to synthesize research findings in agriculture, food systems, and nutrition, to identify where evidence exists and where there are knowledge gaps. This information will help drive future research on how to reshape food systems to improve health and nutrition, and will enhance programming to meet U.S. Government objectives and the global Sustainable Development Goals.

To meet this need, the Feed the Future Innovation Lab for Nutrition at Tufts University (NIL) published an [evidence review](#) in 2019. The review summarizes recent thinking and research findings on how agriculture and food systems affect diets and nutrition; and identifies gaps where work is needed to guide policies and investments in evidence-based programs in low-income countries.

Building on the NIL review, USAID held an e-consultation in November 2019, with support from USAID Advancing Nutrition and [Agrilinks](#), inviting academics, donors, implementers, private-sector actors, and other stakeholders to respond to the evidence review and share their own knowledge and priorities for the food system and nutrition research landscape.

The topics listed in box I were drawn from the review and used to organize the e-consultation, which consisted of a webinar to share findings from the evidence review, a week of online discussions, and a survey to validate the online discussions and prioritize research opportunities. USAID Advancing Nutrition hosted the webinar with NIL on November 12, 2019, to introduce the objectives and topics of the e-consultation. Stakeholders were then invited to participate in online discussions to identify additional opportunities for future research and to corroborate or disagree with the opportunities posed in the NIL evidence review. These moderated discussions took place from November 12–18 on [Agrilinks](#), an online platform.

To encourage broad input regardless of geographic location, the discussions were open for the full week, and moderators guided discussions on each topic during two-hour blocks of time during working hours of two major time zones. Participants provided feedback on the research opportunities identified in the NIL evidence review and suggested ideas for additional areas of research. Finally, a survey was circulated on November 22 and was open until December 6, asking participants to prioritize research opportunities identified in the e-consultation and the NIL evidence review.

Nine-hundred and twenty individuals registered for the webinar and e-consultation representing 86 countries and 433 organizations. Of these registrants, 257 attended the webinar and 45 commented

#### Box I. E-Consultation Topics

- Agricultural production of nutrient-rich foods
- Agriculture-nutrition linkages at population scale
- Food processing
- Food safety
- Food loss and waste
- Gender, resilience, and sustainability
- Metrics and methods (included across all topics)

during the online e-consultation. Additionally, 266 people responded to the survey, which did not require registration to participate. For more detailed information on participants, see the table in Appendix II.

## Conclusions

Results from the e-consultation suggest that more research is needed to understand the numerous, complex points of intersection between food systems and nutrition. To achieve this, participants called for coordinated research and investment efforts globally, at all levels.

While findings from the e-consultation reinforced the research opportunities highlighted in the evidence review, they also made clear that opportunities are far more expansive than those covered by the evidence review. The e-consultation represented the perspectives of practitioners and ongoing discussions in grey literature that the evidence review did not capture using published literature. This suggests field-level experience is key to developing context-specific evidence.

Coordination of ongoing and future research will require an emphasis on knowledge management between and among field-level implementers and the academic community. This will help prevent duplication of efforts by providing a forum for exchanging, collaborating, and developing context-specific evidence to inform evidence-based programming and policy.

## 2. Methodology

Our first step in analyzing the data was to compare the research opportunities highlighted in the NIL evidence review to those identified during the online discussions. Many of the opportunities presented in the evidence review were also brought up in the discussions; but the majority of participants in the e-consultation identified additional opportunities (Appendix IV). We categorized these opportunities and identified themes that emerged across the discussions.

We then compiled a comprehensive list of the opportunities identified, and used it to design an anonymous survey that asked a wider audience to prioritize the research opportunities. The survey questions were organized by the same topics as the evidence review and discussion boards, but we expanded the number of topics from four to seven, due to the large numbers of suggested research projects. We disseminated the survey using a strategy that targeted relevant organizations and listservs to gain a wider perspective. The survey asked respondents to select their “top three research priorities” for each topic, and also provided an option for respondents to share additional ideas not included on the list.

## 3. E-Consultation Results

When we compared the e-consultation discussion comments to the research opportunities presented by the evidence review, it became clear how vast food systems are, and how many specific questions remain to be fully answered. Participants in the e-consultation discussion did mention a number of research opportunities that were included in the evidence review, but by far the majority of the discussion comments brought up additional opportunities for research (Appendix I). Additionally, using a food systems approach means that research opportunities will not always fit neatly into only one topic.

### Box 2. E-Consultation Participation

- **86** countries represented
- **257** participants in the kick-off webinar
- **45** participants on the Agrilinks e-consultation
- **4,800+** page views across the event pages
- **3,100+** unique page views across the event pages
- **266** survey respondents

We pulled out some common themes from among the discussion threads and ultimately identified 12 themes that came recurrent frequently in both the review and the e-consultation.

Using the priorities identified by the survey results (Appendix 1), we broke the twelve themes into two “buckets.” The first bucket contained five research themes that emerged as research priorities: 1) markets, 2) innovative methods and technologies, 3) nutrition and health outcomes, 4) prices and affordability, and 5) measurement. The other seven themes were not among the top priorities in the survey, but they warrant further consideration since they were brought up in both the evidence review and the e-consultation: 1) policies, regulation, and enforcement, 2) biofortified crops, 3) the food environment, 4) private-sector incentives, 5) environmental impact, 6) women’s decision-making, and 7) consumer preferences and demand. We also recognize that each of these themes is key to building the evidence base for linking food systems and nutrition or, may already be areas of focus within the research and implementation community.

Following is a brief discussion of each of the twelve themes, drawing from observations of e-consultation participants. Some of the priority research opportunities could fit under more than one of the themes below. The list shows an illustrative set of examples and is not comprehensive.

## Five Priority Themes

### Markets

Research opportunities related to markets came up in the NIL evidence review and the e-consultation discussions, and listed as a top priority in the survey. Participants identified opportunities for research on local markets, rural markets, urban food deserts, markets within food systems, and market infrastructure—among other topics. For example, one research opportunity from the NIL evidence review was, “Understanding of how local markets currently function, how the food redistribution system works, and the types of infrastructural changes necessary to strengthen rural markets.” This was validated by a discussion in the e-consultation discussion. One participant said, “I suggest focusing on local rural food end markets, those within a defined foodshed. International agricultural trade is interesting, but for food markets serving rural markets, a more limited scope may be worthwhile researching. Rural food markets can support quality diets because they can source nutrient-dense foods within a foodshed. Participants in the process identified a number of high-priority research on aspects of the food markets, including:

“I think that lack of adequate/affordable options for processing, storing, transport, and physical marketplace infrastructure will remain a persistent challenge in strengthening rural food markets--especially taking food safety and hygiene into account.”

—E-consultation participant

- What is needed for local markets to support better nutrition outcomes?
- How can food system-level interventions be evaluated most effectively at the household, market, and systems levels?
- How do common practices used by food vendors, traders, and wholesalers to bring perishable products to markets affect consumers’ health?

### Innovative Methods and Technologies

Participants held wide-ranging discussions about new and emerging approaches and their impacts on food production, resilience, and sustainability. For example, one discussion revolved around the possible health impacts of using hormones and enzymes to increase production of nutrient-rich crops and animal source foods. Other discussions examined the impact of technologies on gender and sustainability—for example, the potential to “model scenarios of optimal on-farm crop mixtures and rotations that may be

most beneficial for improved resilience in certain regions, considering current patterns in climate variability.”

Top research priorities related to innovations and technology that emerged included:

- How have advancements in technologies used at the household level mitigated post-harvest loss and affected the availability of nutritious foods?
- Which food processing methods are most efficient, requiring fewer resources and producing less waste?
- What are the nutrition outcomes of farmers' use of good agricultural practices to maximize production of nutrient-rich foods and livestock production?

### **Nutrition and Health Outcomes**

Both the NIL evidence review and responses from online survey participants brought up a range of topics on the nutrition- and health-related outcomes of food systems, including the effects of food processing on nutrition and health, and the relationship between market access and nutrition and health. The online discussion also identified research gaps, such as the role of policies to incentivize or disincentivize both production and consumption of nutritious diets and foods. The e-consultation results also raised questions about communication and information sharing on health, nutrition, and diets.

Key research gaps that emerged included:

- How can food systems best support healthy diets that promote both resilience and sustainability?
- What are the estimated individual and combined impacts of food-borne exposure to microbial hazards, pesticides, and mycotoxins on human health?
- What is the best way to communicate nutrition information to consumers at different socio-economic levels to move behaviors towards healthy purchases?
- How can we harmonize and improve dietary diversity indicators to measure nutrition behavior change?

### **Prices and Affordability**

Questions related to affordability were prevalent. The NIL evidence review cited research opportunities, such as, “research into understanding the cost of nutritious diets through innovative price indices.” E-consultation participants posed additional ideas: for example, one participant said, “A qualitative research methodology to model the weight of price, convenience, desirability, and availability in individual purchase decisions, as well as in conversations that families have about food purchases, would be very helpful.”

Top priorities for research related to affordability included:

- How do the availability, affordability, desirability, and convenience of nutrient-rich foods in markets affect human nutrition?
- How can we design and evaluate interventions to improve both physical and financial access to safe, nutritious foods?

“Food prices are one area that we can get good data to determine whether investments in market-led interventions are being successful at making nutrient-rich foods more available and more affordable. I think a key question is how far does price/affordability take us toward improving consumption of a more diverse, nutrient-rich diet, especially among the target groups we are most trying to reach?”  
—E-consultation participant

## Measurement

Examination of measurement—of inputs, outcomes, methods, or systems—accounted for the majority of research opportunities in both the e-consultation and the NIL evidence review. The NIL review, for example, suggested research questions on clarifying how agricultural interventions affect women’s workloads, such as impacts on child care and time burdens. Discussion participants’ questions on how to measure food safety, food loss, and food contamination throughout the supply chain, especially post-harvest, echoed the question posed in the review. These discussions validated the research opportunity highlighted in the NIL evidence review on identifying and mitigating food safety issues further down the supply chain, from post-harvest to markets. Similarly, both the NIL review and the online discussions pointed out the need for better measurement of food losses to establish a firm evidence base from which to assess food loss and waste globally.

“I think there are still significant gaps in evidence around where food loss of nutritious foods and food safety hazards are occurring along the supply chain, particularly post-farm gate.”  
—E-consultation participant

Top research opportunities in measurement included:

- How do we measure the scalability and sustainability of food system interventions for nutrition?
- What short-, medium-, and long-term outcome measures are missing to measure change in agriculture and food systems for nutrition?
- Which food processing methods are most efficient—requiring fewer resources and producing less waste?
- How does women's time use affect nutrition outcomes, and what are the impacts of interventions that seek to improve women’s time use?

## Seven Additional Research Opportunities

1. **Policies, regulation, enforcement:** Both the NIL evidence review and the online discussions identified possible research on policies (subsidies and taxes), as well as regulation and enforcement, that strengthen or reduce access to healthy nutrition. For example, in the NIL evidence review section on agriculture and nutrition linkages at population scale, 9 of the 18 opportunities listed focused on policies.
2. **Biofortified crops:** Participants in the discussions brought up a number of comments on biofortified crops (production, consumption, sustainable marketing). The e-consultation discussion about production and processing, particularly, included a robust discussion on the challenges of producing bio-fortified and hybrid crops, and on increasing market demand for such crops. Opinions differed as to whether there is sufficient existing research, or whether this is a research gap. Participants shared links to existing research and outlined research opportunities.
3. **Food environment:** A few participants said that the food environment is an important research area, while acknowledging ongoing research in this area by Food and Agriculture Organization. A facilitator asked about the utility of the framework developed by the Agriculture, Nutrition & Health Food Environment Working Group (ANH-FEWG): “Have others found the idea of a food environment [that functions as] the interface between food systems and individual diets to be helpful when designing programs and policies, or when conceptualizing research and interpreting research findings?” One participant responded, “I’ve found the work of the ANH Academy Food Environment Working Group indispensable for

designing research and nutrition-sensitive agriculture programs.” Another said, “I don't think that the evidence review found much documentation on efforts being made by governments to improve the food environment for nutrition.”

4. **Private-sector incentives:** Research opportunities related to the private sector centered mostly on incentives for various private-sector actors. These included determining how to incentivize processors and retailers, how to engage service providers to bring more options to rural producers and traders, and types of market incentives that could encourage the private sector to adopt safer practices and improve the availability of nutrient-rich complementary foods. One participant said, “I feel there is a huge gap in our sector of people willing to have serious conversations about what the role of the private sector currently is, and what can be done to improve it.”
5. **Environmental impact:** Participants in the e-consultation made few comments about e research opportunities related to the environment or natural resources, but survey respondents added a number of opportunities in the comment boxes. Nearly all centered on making more efficient use of natural resources, decreasing waste, and increasing resilience. For example, one participant asked, “To what extent can modest investments in supply chain infrastructure minimize food loss and waste as well as risk to the environment and to nutritional status of at-risk segments of the population?” Another recommended research on integrating environmental considerations into food systems that promote resilience and sustainability.
6. **Women’s decision-making:** Survey respondents did not select gender-related research opportunities as a top priority, but both the NIL review and the e-consultation mentioned potential research projects on women’s roles in obtaining food. Many participants suggested research on women’s decision-making. One said, “I think it will also be interesting to look into how women's influence, decision-making power, and work burden also influence their market purchase decisions and food choices... I think it would be interesting to see if/how empowerment is related to drivers of food choice.” One survey respondent asked, “How does greater support to women farmers (training/ planting supplies/women’s farming groups) and equitable decision-making [on women’s] household expenditure ... affect household nutrition outcomes?”
7. **Consumer preferences and demand:** Both the evidence review and the e-consultation brought up a number of potential research opportunities for examining consumer preferences and demand. The review identified 11 opportunities, such as, “Understand what motivates interpretation of food labels or other promotional education campaigns designed to nudge consumers towards healthier choices.” One survey respondent asked, “What factors are most important in shaping consumer demand for nutritious foods?” Several participants discussed the kinds of cues consumers use to decide what foods to purchase (based on nutrition, food safety, etc.)—for example: “understanding the extent to which the cues consumers use to assess whether food is safe (e.g., it being wrapped in plastic, or sold by a vendor with clean clothes) actually align to reduce food safety risks. When they try to protect themselves, which signals are they looking at? And are they interpreting those signals right?” Another participant asked whether we know anything about “other visual cues that have been effective at the point of sale, and preferably in informal markets?”

## 4. Observations and Conclusion

USAID’s e-consultation was meant to provide an open forum for academics and practitioners to discuss their perspectives on food system research gaps and opportunities. The e-consultation allowed stakeholders to provide their own inputs, and to identify priorities for research and implementation. The input and interest in these topics was impressive given the consultation’s short timeframe. There

was significant interest from the scientific community throughout this process, and it is apparent that a global effort could better maximize evidence generation and coordination. However, more work needs to be done to distill recommendations into research questions that are better focused on country-level needs and priorities.

One of the strengths of our approach is that it used several mechanisms to reach stakeholders from multiple countries and organizations. However, we may have double-counted individuals who participated in the discussions and survey, because we were unable to screen for discussion participants and the survey was anonymous. It is also possible that moderators shaped the direction of the e-consultation conversations, because they initiated and facilitated the discussions. Though the e-consultation highlighted many gaps in research on food systems and nutrition, it became clear that compiling and sharing existing research also requires additional work. Many more research topics and ideas that emerged in the e-consultation that the evidence review did not capture due to the protocols included in their search methodology. A summarized list of these additional topics appears in Appendix IV.

The findings from this process suggest a potential disconnect between evidence that may exist in the gray literature and what is found in the published literature. Practitioners' participation in the e-consultation showed that field-level experience is a potentially rich source of context-specific evidence. However, the design, quality, and documentation of studies on field-based work may exclude it from the attention of academics. At the same time, practitioners working at the field level need greater awareness about existing research that might be applied and adapted for use in different contexts. These findings call for stronger efforts to find, compile, promote, and share evidence between the research and implementation communities. A consistent message from participants showed to the need for global coordination and research investments at all levels.

This e-consultation underscored the need to examine how current government and donor investment strategies and priorities overlap with or support identified research opportunities. Bridging knowledge and evidence gaps will require an emphasis on knowledge management between and among the academic community and field-level implementers. This would avert replication of effort by providing a central space to share, access, consult, and adapt research to specific contexts. Finally, there is a need to share emerging knowledge with stakeholders and governments to support evidence-based change at the policy level.

## Appendix I: Key Survey Results

The e-consultation included a survey that gathered research opportunities identified in the evidence review and online discussions as a way of prioritizing research questions and obtaining input from a wider range of stakeholders. The survey was shared with e-consultation registrants, the Ag2Nut Community of Practice, Core Group, and Universities, resulting in 266 responses from representatives of more than 180 organizations in 57 countries. For more detailed information on participants, see the table in Appendix III. Participants selected their top three priorities for each of the topic areas, based on the full list of opportunities identified in the evidence review and e-consultation. The results for each topic are described below.

### Agricultural Production of Nutrient-Rich Foods

Of the 10 research opportunities included in this area, the first question below emerged as a clear priority, with over half (54 percent) of the 252 respondents selecting it as one of their top three priorities. The second-highest priority was selected by 45 percent of respondents. Fewer than 35 percent of respondents prioritized the remaining opportunities, many of which had similar rankings, indicating varying perspectives about which opportunities are most important.

1. How do the availability, affordability, desirability, and convenience of nutrient-rich foods in markets affects human nutrition?
2. How does farmers' use of good agricultural practices maximize production of nutrient-rich foods?

### Agricultural Linkages at Population Scale

The review and e-consultation identified 13 research questions for this area, more than for any other topic. The three questions below emerged as key priority areas, chosen by 42 percent, 40 percent, and 33 percent, respectively, of the 235 respondents. The survey also revealed some low-priority areas: research related to subsidies (11 percent), market incentives (6 percent), and taxes (5 percent).

1. How can we design and evaluate interventions to improve both physical and financial access to safe, nutritious foods?
2. What is the best way to communicate nutrition information to consumers at different socio-economic levels to change behaviors towards healthy purchases?
3. What is needed for local markets to better support nutrition outcomes?

### Processing

The review and consultation identified five research questions on processing. In this category, research examining efficient food processing ranked highest, selected by 63 percent of the 231 respondents. However, all research opportunities in this area received similar rankings; 58 percent of respondents chose question 2 below, and 48 percent chose the lowest-ranking question. This may suggest that all research questions on processing require more investigation, or that respondents have divergent opinions about what research is needed.

1. Which food processing methods are most efficient--requiring fewer resources and producing less waste?
2. How does food processing affect nutrition?

### Food Safety

Of the 11 research opportunities identified, the two questions below emerged as priorities, chosen by 47 percent and 37 percent, respectively of the 225 respondents. Rankings of the remaining research



opportunities were mixed, with between 19 percent and 30 percent prioritizing one of those questions, suggesting varied perspectives about what areas of food safety are most important.

1. How do common practices that food vendors, traders, and wholesalers use to ensure perishable products reach markets impact the health of consumers?
2. What are the estimated individual and combined impacts of foodborne exposure to microbial hazards, pesticides, and mycotoxins on human health?

### **Food Loss and Waste**

Only four research gaps were selected for the survey—probably because there is generally a dearth of information in this area, and fewer specific research opportunities have been identified. Of 225 respondents, 80 percent selected question 1 below as a main priority; questions 2, 3, and 4 were closely ranked (68 percent, 64 percent and 61 percent, respectively).

1. How have advancements in technologies used at the household level mitigated post-harvest loss and impacted the availability of nutritious foods?
2. How does market transformation and improvements to infrastructure affect food loss?
3. Are local food systems more effective at minimizing food loss than regional or global supply chains?
4. How can population-level interventions minimize food loss?

### **Gender, Resilience, and Sustainability**

The review and discussions identified six research questions on gender, resilience, and sustainability, with question 1 below as the standout priority. It was selected by 67 percent of 224 respondents. The next two questions were ranked at 50 percent and 49 percent, respectively; between 38 and 50 percent of respondents prioritized the remaining questions. The remaining six research opportunities were similarly ranked, selected by between 38 and 50 percent of respondents. This may indicate differing opinions among participants about what research is needed, or a demand for more research generally.

1. How can food systems best support healthy diets that promote both resilience and sustainability?
2. How do cultural norms affect women's physical access to different nutrient-dense foods?
3. How does women's time use affect nutrition outcomes, and what are the impacts of interventions that seek to improve women's time use?

### **Measurements**

The survey included five research opportunities on metrics and measurements in the food system. The top three questions were prioritized by 64 percent, 62 percent, and 61 percent, respectively, of the 222 respondents, with the fourth following closely behind. Overall, there seems to be a need for more research in this area.

1. How can food system-level interventions be most effectively evaluated at the household level, market level, and systems level?
2. How do we measure scalability and sustainability of food system interventions for nutrition?
3. What short-, medium-, and long-term outcome measures are missing to measure change in agriculture and food systems for nutrition?

## Appendix II: Descriptive Statistics of E-Consultation Participants

Description	Total
Webinar and e-consultation registrants	920
Participants by region	
North America (USA & Canada)	235
Latin America and the Caribbean	29
Europe	62
Africa	369
Asia	106
Oceania	6
Total of unique countries represented	86
Participants by sector	
NGO	393
Private Sector	57
Government Institution	82
University	149
UN Representatives	63
Total of unique organizations represented	433
Registrants that attended the webinar	257
Registrants that commented on Agrilinks	45

## Appendix III: Descriptive Statistics of Survey Respondents

Description	Number of Respondents
Survey respondents (the survey respondents were not required to register for the e-consultation)	266
Total of unique countries represented	187
Total of unique organizations represented	57

## Appendix IV: Additional Research Opportunities

Topic Area	Research opportunities that emerged in the e-consultation that the evidence review did not include
<b>Food Production</b>	<ul style="list-style-type: none"> <li>• Barriers to adoption for nutritious food production technologies</li> <li>• Critical role of policy and legislation in incentivizing/dis-incentivizing nutritious crop production using strategic implementation research</li> <li>• Interventions to promote nutrition education</li> <li>• Modeling the labor needed to adopt and maintain new agricultural or market practices that promote nutrition</li> <li>• Indigenous crops for improved nutrition</li> <li>• Dietary patterns and preferences and how to use communication and behavior change to increase consumption of nutritious food</li> <li>• Scalable, climate-smart production technologies for nutritious food</li> <li>• Linkages between overproduction and food waste</li> </ul>
<b>Food Processing</b>	<ul style="list-style-type: none"> <li>• Innovative processing methods to and R&amp;D for nutritious food &amp; beverages</li> <li>• Nutrition impacts of fish and other low-trophic animal-based foods</li> <li>• Processing technology and opportunities to reduce women’s time burden</li> <li>• Building an enabling policy environment for nutritious food processing</li> <li>• Small scale, cost-effective, and safe food processing technologies</li> <li>• Implications of overnutrition for the processing and production of nutrient-rich food in LMICs</li> <li>• Processing technologies to extend the shelf life of food products</li> <li>• Impacts of food processing on food quality and nutrient content</li> <li>• Role of private sector in food processing and nutrition</li> </ul>
<b>Nutrition-Agriculture Linkages a Population Scale</b>	<ul style="list-style-type: none"> <li>• Nutrition impacts of cash transfer programs</li> <li>• Diet diversity impacts of the consumption of own food vs. food purchased at markets in urban areas</li> <li>• Ways to prevent food deserts and ensure access to wet markets</li> <li>• Needs assessments to develop approaches that target socially and economically vulnerable populations</li> <li>• How food purchase decisions are influenced by women’s decision-making power, influence, and time burden</li> <li>• Refine or develop short-, medium-, and long-term outcomes to measure change in agriculture and food systems for nutrition</li> <li>• Food-choice decisions and compromises related to choosing nutritious foods</li> <li>• Dynamics between water availability/access and the food system</li> <li>• Field studies to test the effectiveness of biofortified crop consumption to improve nutrition</li> <li>• Cost-effectiveness of increasing rural roadways to improve access to markets and nutritious foods</li> <li>• Impacts of seed policy on nutrition</li> </ul>

	<ul style="list-style-type: none"> <li>• Impact of public distribution systems on nutrition</li> <li>• Effective policy levers for incentivizing increased consumption of nutrient-rich foods</li> <li>• Alternative proteins and food sources such as cellular and acellular agriculture, edible insects, plant based proteins</li> </ul>
<b>Food Safety</b>	<ul style="list-style-type: none"> <li>• Food safety issues related to fish and fish-based products</li> <li>• Safety of food preservation and ripening agents</li> <li>• Methods to reduce food safety hazards post-farmgate, including at the marketplace, in storage, and in the household</li> <li>• Ways to improve the enforcement and regulation of food safety policies, such as market incentives</li> <li>• Effective methods for communicating food safety issues to consumers, particularly in informal markets</li> <li>• Knowledge of food safety hazards and their impact on hygiene and nutrition</li> <li>• Food packaging approaches that reduce contamination</li> <li>• Methods for increasing food safety in traditional food systems</li> </ul>
<b>Food Loss and Waste</b>	<ul style="list-style-type: none"> <li>• Relationship between food loss and diet diversity</li> <li>• Using byproducts to reduce waste and improve nutrition</li> <li>• Characterizing and quantifying post-harvest nutrient loss and identifying mitigation strategies</li> <li>• Market entry points for reducing loss and waste</li> <li>• Use of indigenous knowledge and practices to inform food waste/loss mitigation strategies</li> <li>• Relationship between production diversity and food loss</li> <li>• Incentives/disincentives for consumers, the private sector, and farmers to reduce food waste and loss</li> <li>• Packaging technology to reduce food loss</li> </ul>
<b>Metrics and Methods</b>	<p>This topic was discussed across the other six topic areas and was not analyzed separately.</p>
<b>Resilience, Gender, and Sustainability</b>	<ul style="list-style-type: none"> <li>• Increase the gender-sensitivity of agricultural innovations/technologies</li> <li>• Linkages between male family members and household nutrition</li> <li>• Cultural factors that negatively impact nutrition</li> <li>• Indigenous knowledge to improve gender, resilience, and sustainability</li> <li>• Social, political, and commercial determinants of inequity and their impacts on to food access for different populations</li> <li>• Climate-smart approaches for improving food availability, quality, and nutrition</li> <li>• Incorporating planetary health issues into food systems approaches</li> </ul>



## **USAID ADVANCING NUTRITION**

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