



FEED THE FUTURE

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



FY2022 SEMI-ANNUAL REPORT

FEED THE FUTURE INNOVATION LAB FOR FOOD SAFETY



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Cornell University

Feed the Future Innovation Lab for Food Safety (FSIL)

FY2022 Semi-Annual Report

Performance Period: October 1, 2021 – March 31, 2022

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RESEARCH PROGRESS SUMMARY

Research progress made during the reporting period

Management Entity Objective I: Achieve and maintain high standards in management performance through effective structures, a dynamic and adaptive personnel team, and a culture of open communication within the ME, FSIL, and with internal and external stakeholders.

Activity I.1: Create and maintain effective management structures and practices that promote the success of active FSIL projects

In November 2021, FSIL held its first hybrid annual meeting in Indianapolis, Indiana. Attendees included USAID representatives, FSIL's Advisory Committee, FSIL's Technical Experts, and subaward recipients. The event provided an opportunity to share project updates and feedback, foster collaboration among projects, and emphasize project linkages to nutrition, awareness of emerging climate change impacts on food safety, and FSIL's commitment to diversity, equity, inclusion, and accessibility. The FSIL management team also continued to host virtual monthly meetings with active subawards to monitor progress and troubleshoot issues. The FSIL Director and Associate Director traveled to Kenya in March 2022 to observe project activities and conduct lab safety monitoring as part of FSIL's Environmental Mitigation and Monitoring Plan (EMMP). Gender Working Group meetings were held in December 2021 and March 2022 with representation from all long-term subawards. Participants shared updates on gender-related activities and exchanged best practices.

Activity I.2: Manage the selection and implementation of MSI-led partnerships for global food safety research through a competitive RFA process

During the performance period, FSIL concluded its RFA (Request for Applications) for Minority Serving Institution (MSI)-led partnerships for global food security research. Of the six eligible full proposals which were reviewed in the final RFA stage, two projects were selected and approved by USAID. One project will be implemented in Nepal and led by Tennessee State University, a Historically Black College/University (HBCU). The second project will be implemented in Nigeria and led by the University of Alaska Fairbanks, which is designated as both an Alaska Native and Native Hawaiian Serving Institution (ANNH) and a Native American-Serving Nontribal Institution (NASNTI). Project leaders were able to engage in FSIL's first annual meeting and network with the FSIL community.

Activity I.3: Develop robust MEL, communication, and open data platforms

After the selection of the two MSI-led projects, the FSIL management team updated Piestar DPx to reflect the projects' work plans and provided onboarding resources to the new researchers. Both new and existing FSIL subawards received support in data management and sharing from Purdue's Ag Data Services. Project activities and updates were shared by FSIL through an e-newsletter, Twitter, LinkedIn, and Agrilinks.

Activity I.4: Engage FSIL Advisory Committee and Technical Experts in providing guidance and support to ongoing activities

The FSIL Advisory Committee and Technical Experts met with each active subaward at the annual meeting to discuss project progress and provide guidance on planned activities. The FSIL management team also held strategic conversations with the Advisory Committee and Technical Experts after the annual meeting to debrief their experiences, observations, and input for future strategies.

Cambodia Objective 1: Reducing Foodborne Pathogen Contamination of Vegetables in Cambodia: Innovative Research, Targeted Interventions, and Impactful, Cambodian-Led Engagement (Cambodia Long-Term Subaward)

Researchers began sample collection for the longitudinal study measuring *Salmonella* and *E. coli* contamination of vegetables at farms, distribution centers, and markets in February 2022. In Battambang, two farms were visited and lettuce samples were collected for microbiological analysis. Two additional farms were visited and cucumber samples were collected for microbiological sampling. Additionally, three cucumber farms and two lettuce farms were sampled in Siem Reap. No farms were found to be growing tomatoes during this timeframe. For distribution center and market-level samplings, samples (vegetable and environmental) were collected from two distribution centers and three market vendors. All samples were transported to Phnom Penh, and traditional microbial analysis was conducted on each sample to identify and assess the prevalence of *Salmonella* and *E. coli*.

The project also developed a survey tool based on behavior theory to assess producers' and market vendors' willingness to adopt food safety practices, which was created and piloted in 2021. After piloting and making necessary revisions to the tool, the team finished data collection and aims to submit these results for peer review by the end of FY2022. In a companion study, researchers concluded data collection for a survey measuring perceptions of food safety among individuals involved in vegetable production in Cambodia.

Finally, the project delivered a virtual five-week Qualitative Research Methods course with 48 participants. Participants who completed the course will have the opportunity to engage in data collection for the project's gender analysis later in 2022.

Bangladesh Objective 1: Enhancing Food Safety in Fish and Chicken Value Chains of Bangladesh (Bangladesh Long-Term Subaward)

In FY2021, three trial ponds in the Mymensingh district were stocked with three targeted fish species (rohu, tilapia, and pangasius) as part of the study of microbial and chemical contaminants in the fish value chain. Since then, research staff have conducted regular monitoring visits. In February and March 2022, physical samples of fish were collected from the trial ponds and surrounding control ponds at the same value chain node (farm gate/pond bank) for relative food hazard evaluation. These samples are being analyzed for microbial contaminants, antibiotic residues, and heavy metals in the intestine, gill, and flesh. Select frozen chicken drumstick products were also collected to evaluate microbiological and chemical hazards in commercial products.

Several semi-structured survey questionnaires have been developed to evaluate food safety and risk knowledge, attitude, and practices (KAPs) related to fish and select chicken products. Thus far, one survey has been initiated on women's engagement in aquaculture and their KAPs of food safety and fish. The survey instrument was pre-tested with a small group of women farmers, and data collection is now occurring in the Mymensingh district.

Finally, a manuscript entitled "A systematic review of fish adulteration and contamination in Bangladesh: Way forward to food safety" was drafted and submitted to *Reviews in Aquaculture*.

Kenya Objective 1: Chakula salama: a risk-based approach to reducing foodborne disease and increasing production of safe foods in Kenya (Kenya Long-Term Subaward)

The project's risk prioritization workshop, designed to rank potential management interventions for mitigating *Salmonella* and *Campylobacter* in the smallholder poultry value chain, was held in March 2022 at the Kenya Medical Research Institute. A total of 13 participants, including 10 stakeholders and three food safety experts, attended over three days. The workshop identified three high-priority interventions for

the reduction of *Salmonella* and *Campylobacter* in the local poultry value chain: (i) training/sensitization on pre-harvest sanitation, (ii) training/sensitization on post-harvest sanitation, and (iii) biosecurity and farm sanitation.

As previously highlighted by the project, the prevalence of *Salmonella* and *Campylobacter* contamination in the poultry value chain in Kenya is not well characterized. Reviewing the limited available literature, researchers prepared a manuscript that provides insights into existing data. The manuscript is nearing completion and will be submitted for publication later in FY2022. The project is positioned to address the data gap identified in the literature review through its planned microbiological surveys. During the first half of FY2022, researchers drafted protocols for the microbiological surveys and planned practical, lab-based training on sample processing that will be held prior to survey implementation.

Senegal Objective I: Food Safety Capacity Building in Senegal: Enhancing Resilience of the Dairy Value Chain by Leveraging Public-Private Partnerships (Senegal Long-Term Subaward)

Project collaborators identified food safety gaps in dairy production and processing practices that will be targeted for future research and interventions. Topics of future investigation within the dairy value chain include: cold chain and local certification issues as they relate to food safety, hygiene and sanitation issues in milking facilities, microbial spoilage during storage and the lack of timely pasteurization capabilities, the definition of mini-dairies, and opportunities to better integrate food safety as well as gender and youth into existing policies related to dairy. Five Senegalese graduate students were recruited to participate in the project and conduct research focused on these priority areas.

The project team also developed three manuscripts describing the food safety challenges around milk production, milk processing and the involvement of women and youth in the dairy value chain. These literature reviews are being reviewed internally and will be submitted for peer review later in FY2022.

Issues or concerns encountered during the reporting period

Project-specific concerns

Bangladesh

One of the two prospective Ph.D. students selected by the project at the end of FY2021 has not been able to begin their studies as planned in FY2022. The prospective student is currently employed by the Bangladeshi government, and they must obtain a formal work release before enrolling at Bangladesh Agricultural University. The paperwork authorizing the work release is pending as of March 2022. If the work release is not authorized by April 2022, the project team will recruit a new Ph.D. student to prevent further delays.

Kenya

The planned gender analysis has not commenced due to delays in securing Institutional Review Board (IRB) approvals. IRB applications were submitted to the University of Florida, the Ohio State University, and the University of Nairobi in late 2021, but the review by the University of Nairobi has taken several months and remains pending as of April 2022. The project team is working to address institutional barriers at the University of Nairobi so that the gender analysis as well as project activities that are dependent on its results can be completed.

Nigeria

Due to turnover in university administration, the SAM registration of the project's in-country partner institution, Bowen University, had not been renewed promptly and became inactive. The complexity of the SAM.gov website, coupled with identifying a new Entity Administrator, created significant challenges for Bowen University. The FSIL management team worked extensively with Bowen University to designate

a new Entity Administrator and renew their SAM registration. FSIL submitted the project's subaward requests to USAID while the SAM reactivation process was ongoing, but USAID did not review and provide feedback until seven weeks after submission. This has delayed Purdue's ability to issue subawards and commence project implementation.

Senegal

Leadership changes and organizational restructuring at the Institut Senegalais Recherches Agricoles (ISRA) and Conseil National du Développement de la Nutrition (CNDN) contributed to delays in establishing a formal memorandum of understanding among Senegalese project partners. This resulted in an interruption of fund disbursement to Senegalese partners, which limited the full participation of the research team.

HUMAN AND INSTITUTIONAL CAPACITY DEVELOPMENT

A. Short-term training

Country of Training	Brief Purpose of Training	Who was Trained	M	F	Total
Cambodia (virtual)	Introduced qualitative research methods using gender analysis research as a platform. Participants completed Collaborative Institutional Training Initiative (CITI) training.	Civil society	30	18	48
Cambodia (virtual)	Participants were trained in the sample collection process and logistics of the longitudinal study, including sample collection on farms, in distribution centers, and in markets.	Civil society	5	0	5
Cambodia (virtual)	Participants were trained in laboratory techniques to identify and isolate <i>Salmonella enterica</i> and <i>Escherichia coli</i> from vegetable and environmental samples.	Civil society	9	12	21
Total			44	30	74

B. Long-term training

Trainee Number	Sex	University	Degree	Major	Program End Date (M/Y)	Degree Granted (Y/N)	Home Country
1*	F	Purdue University	Ph.D.	Agricultural Sciences Education and Communication	May 2023	N	United States
2*	M	Purdue University	Ph.D.	Agriculture Economics	May 2023	N	United States
3	M	Cornell University	Ph.D.	Food Science and Technology	May 2024	N	United States
4	F	Royal University of Agriculture	M.S.	Agro Industry (Food Microbiology)	June 2023	N	Cambodia

5	F	Royal University of Agriculture	M.S.	Agro Industry (Food Microbiology)	June 2023	N	Cambodia
6	F	Purdue University	M.S.	Animal Science	December 2022	N	United States
7	M	Purdue University	Ph.D.	Agricultural Sciences Education and Communication	June 2024	N	United States
8	F	Bangladesh Agricultural University	M.S.	Agricultural Economics	June 2022	N	Bangladesh
9	F	Bangladesh Agricultural University	M.S.	Food Technology and Rural Industries	June 2022	N	Bangladesh
10	F	Bangladesh Agricultural University	M.S.	Agricultural Finance and Banking	June 2022	N	Bangladesh
11	F	Bangladesh Agricultural University	M.S.	Microbiology and Hygiene	June 2022	N	Bangladesh
12	M	Bangladesh Agricultural University	Ph.D.	Agricultural Economics	October 2024	N	Bangladesh
13	F	National School of Agriculture (ENSA)	M.S.	Animal Production	December 2022	N	Senegal
14	M	National School of Agriculture (ENSA)	M.S.	Value Chain Development Agriculture & Agribusiness Entrepreneurship	December 2022	N	Senegal
15	F	Polytechnic School of Dakar	M.S.	Engineering in the Food Industry	December 2022	N	Senegal
16	M	National School of Agriculture (ENSA)	M.S.	Value Chain Development Agriculture & Agribusiness Entrepreneurship	December 2022	N	Senegal
17	F	National School of Agriculture (ENSA)	M.S.	Value Chain Development Agriculture & Agribusiness Entrepreneurship	December 2022	N	Senegal
18	F	Institute of Technology of	M.S.	Agri-Industrial Engineering	September 2023	N	Cambodia

		Cambodia (ITC)					
19	F	KEMRI	M.S.	Medical Microbiology	December 2023	N	Kenya
20	M	KEMRI	M.S.	Medical Microbiology	December 2022	N	Kenya

*Supported by FSIL for the fall 2020 semester.

FUTURE WORK

Management Entity

- At the culmination of the MSI RFA process, FSIL will finalize subagreements between Purdue University and subaward institutions for two new projects in Nepal and Nigeria. The Nepal and Nigeria projects will begin active implementation in April and May 2022, respectively.
- The FSIL management team will maintain monthly meetings with all subawards to monitor the progress of research activities, troubleshoot issues, and collaboratively develop plans. Monthly check-ins with FSIL's two new subawards in Nepal and Nigeria will begin in April 2022. Quarterly gender working group meetings will also continue throughout the remainder of the year.
- FSIL will host its second mid-year Virtual Project Exchange in May 2022. Similar to FY2021, this event will feature project updates from all subawards and offer opportunities for USAID, FSIL technical experts, and the FSIL advisory committee to provide feedback to research teams.
- A webinar will be hosted in June or July 2022 on the topic of wastewater surveillance for foodborne diseases. The purpose of this webinar is to share information about the technique and stimulate discussion of its potential application to shape food safety priorities in low- and middle-income countries.
- FSIL will amplify its communication of project activities and results through web stories, e-newsletters, social media, and Agrilinks. FSIL's MSI engagement work will be highlighted in the remainder of FY2022.

Long-Term Subawards

Bangladesh

- Analysis of fish samples for microbial contaminants, antibiotic residues, and heavy metals will be completed.
- After laboratory results are obtained from the aforementioned analyses, researchers will initiate experimental auctions to assess consumers' willingness to pay for safer fish products in the districts of Mymensingh, Dhaka, and Patuakhali.
- Surveys and focus group discussions will be conducted to assess KAPs pertaining to food safety and risk issues related to fish and chicken products.

Cambodia

- Sample collection and analysis will continue for the longitudinal study, targeting a total of 60 locations, including farms, distribution centers, and market vendors.
- A women's leadership program will be developed by Kansas State University and the Center of Excellence for Sustainable Agricultural Intensification and Nutrition in collaboration with Banteay Srei, a Cambodian non-governmental organization focused on women's empowerment which is currently working in Siem Reap and Battambang. Initial steps include a preliminary assessment of women's attitudes and perceptions towards leadership and their knowledge of food safety and development of a training-of-trainers program.

- Studies on food safety perceptions and willingness to adopt food safety practices will be completed, and associated publications will be drafted.
- An auction-based study on Cambodians' willingness to pay for safer foods will be initiated with WorldVeg.

Kenya

- Microbiological surveys to estimate the prevalence of *Salmonella* and *Campylobacter* in poultry products in Kiambu County will be conducted.
- The findings from the risk prioritization workshop will be summarized and distributed to the participants and other stakeholders. At the request of workshop participants, the project team plans to utilize a common communication platform to connect researchers and stakeholders, answer questions, and disseminate information, including research results.
- Based on the results of the risk prioritization workshop as well as the literature review, the team will select specific interventions for evaluation.
- Once the IRB issue with the University of Nairobi is resolved, the project will conduct a gender analysis of the poultry value chain in Kiambu County using key informant interviews, focus group discussions, and a household survey.

Senegal

- The project PI will travel to Senegal in May 2022 to meet with project partners and graduate students to develop research plans to target identified food safety gaps in the dairy value chain.
- Half-day workshops will be held in the Louga, Matam, and Saint Louis regions to raise awareness of food safety issues and gain further insights into challenges faced by mini-dairies and dairy cooperatives.

Attachment A: FY2022 Work Plan

Management Entity: FY2022 Work Plan for the Feed the Future Innovation Lab for Food

Objectives, Activities, and Sub-Activities	Timeline of Activity (October 1, 2021 - September 30, 2022 - FY2022)												Country and Location(s) of Activity	Person or Institution Responsible	
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep			
Objective 1: Maintain high standards in management performance through effective structures, a dynamic and adaptive personnel team, and a culture of open communication within the ME, FSIL research community, and with internal and external stakeholders.															
Activity 1.1: Create and maintain effective management structures and practices that promote the success of active FSIL projects															
1.1.1 Develop and submit semi-annual performance reports, annual work plan, data management plan update, and other required operational documents to USAID														USA	Haley Oliver (Purdue), Randy Worobo (Cornell), Molly Webb
1.1.2 Monitor and guide all subaward/project activities through virtual monthly meetings, field visits, and personal correspondence														USA	Haley Oliver (Purdue), Randy Worobo (Cornell), Molly Webb
1.1.3 Monitor implementation of the EMMP; PIs and co-PIs will report on relevant activities through Piestar DPx, and the FSIL ME and USAID will review														USA	Haley Oliver (Purdue), Randy Worobo (Cornell), Ahmed
1.1.4 Host FSIL gender community of practice meetings														USA	Hui-Hui Wang (Purdue), Haley Oliver (Purdue)
1.1.5 Host virtual or in-person meeting of FSIL project leaders, technical experts, advisory committee, and USAID to promote collaboration and learning across the FSIL research portfolio														USA	Haley Oliver (Purdue), Randy Worobo (Cornell), Molly Webb
Activity 1.2: Manage the selection and implementation of MSI-led partnerships for global food safety research through a competitive RFA process															
1.2.1 Select projects to fund in consultation with USAID AOR and obtain formal approval of subawards from USAID AO														USA	Haley Oliver (Purdue), Randy Worobo (Cornell), Ahmed
1.2.2 Execute subawards associated with selected MSI-led projects and partners														USA	Purdue business office, Julie Hancock (Purdue), Molly
1.2.3 Conduct onboarding workshops with each new project to review policy requirements and discuss implementation of technical work plans														USA	Haley Oliver (Purdue), Randy Worobo (Cornell), Molly Webb
1.2.4 In partnership with USAID AOR, introduce new MSI-led projects to the respective Missions														USA	Haley Oliver (Purdue), Randy Worobo (Cornell), Ahmed
Activity 1.3: Develop robust MEL, communication, and open data platforms															
1.3.1 Update Piestar DPx to reflect new subaward work plans of the new MSI-led projects														USA	Julie Hancock (Purdue), Molly Webb (Purdue)
1.3.2 Provide support to all projects as it relates to data collection, storage, and sharing; make datasets available via the FSIL Dataverse and USAID's Data Development Library as they are finalized														USA	Ag Data Services team (Purdue)
1.3.3 Publish quarterly e-newsletters that showcase FSIL activities and updates														USA	Amanda Garris (Cornell), Molly Webb (Purdue)
1.3.4 Maintain engagement on Twitter, LinkedIn, and Agrilinks with publication goal of 8-10 blogs or feature stories during the year														USA	Amanda Garris (Cornell), Molly Webb (Purdue)

1.3.5 Develop and disseminate strategic communications related to FSIL's MSI engagement activities																USA	Amanda Garris (Cornell), Haley Oliver (Purdue), Randy
1.3.6 Host 1-2 webinars on food safety issues. Specific topics will be determined based on feedback from a targeted survey of past attendees																USA	Amanda Garris (Cornell), Haley Oliver (Purdue), Randy
1.3.7 Subawards report progress against the FSIL nutrition impact map (Activity 1.4.2) as part of their MEL plan																USA	Haley Oliver (Purdue), Randy Worobo (Cornell), Julie
Activity 1.4: Engage FSIL Advisory Committee (1) and Technical Experts (2) in providing guidance and support to ongoing activities																	
1.4.1 Collect input from the Advisory Committee and Technical Experts (virtually or in person) on project progress and future priorities; utilize input to refine future programming																USA	Haley Oliver (Purdue), Randy Worobo (Cornell), FSIL
1.4.2 Utilizing support and guidance from the Advisory Committee, design and implement nutrition impacts mapping exercise across all existing and new subawards to identify linkages between food safety																USA	Haley Oliver (Purdue), Randy Worobo (Cornell), FSIL

(1) FSIL Advisory Committee: Ahmed Kablan (USAID), Betsy Baysinger (USDA-FAS), Shibani Ghosh (Tufts University), Gina Kennedy (USAID Advancing Nutrition), Howard Popoola (Kroger & GFSI), Bob Baker (Mars), Greg Grothe (Land O'Lakes/Venture)

(2) FSIL Technical Experts: Kathryn Boor (Cornell), Gerald Shively (Purdue), Amanda Deering (Purdue), Paul Ebner (Purdue), Levon Esters (Purdue), Jacob (Jake) Ricker-Gilbert (Purdue), Hui-Hui Wang (Purdue), and Martin Wiedmann (Cornell)

Cambodia: FY2022 Work Plan for the Feed the Future Innovation Lab for Food Safety

Objectives, Activities and Sub-Activities	Timeline of Activity (October 1, 2021 - September 30, 2022 - FY2022)												Country and Location(s) of Activity	Person or Institution Responsible	
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep			
Objective 1: Reducing Foodborne Pathogen Contamination of Vegetables in Cambodia: Innovative Research, Targeted Interventions, and Impactful, Cambodian-Led Engagement															
Activity 1.1: Identify and characterize key microbial pathogens associated with vegetable-borne foodborne disease(s), characterize pathogen transmission through longitudinal studies, and identify critical control points (CCPs) targeted for interventions															
1.1.1 Execute vegetable sample collection from farms and informal markets in Battambang and Siem Reap														Cambodia	KSU, IPC, RUA, ITC
1.1.2 Conduct microbial analysis for presence and isolation of bacterial pathogens and indicator organisms at IPC, ITC, RUA														Cambodia	KSU, IPC, RUA, ITC
1.1.3 Conduct Whole Genome Sequencing and comparative analysis														USA	PSU
1.1.4 Based on comparative analysis, identify critical control points and coordinate findings with all partners to set a shared research agenda														USA/Cambodia	KSU, PU, PSU, RUA, ITC, NISTI, CCF
Activity 1.2: Identify interventions to reduce microbial contamination at CCPs, assess the willingness-to-adopt for identified interventions, and strengthen food safety networks and public-private partnerships to position interventions for adoption and scaling															
1.2.1 Identify promising technologies and existing strategies and initiate intervention research on the identified technologies and strategies														Cambodia	RUA, ITC, NISTI, CCF, KSU, PU
1.2.2 Measure food safety awareness, practices, willingness-to-adopt in consumers														Cambodia	PU, KSU, PSU RUA, ITC, CE SAIN, WV
1.2.3 Hold annual strategy and progress meeting with all partners and aligned collaborators in the government and private sector														Cambodia	PU, World Veg, RUA, ITC
Activity 1.3: Deliver data-driven engagement programs across the vegetable value chain while measuring the impact and efficacy of these programs															
1.3.1 Deliver engagement programs that improve food safety awareness among consumers, in partnership with the Consumer Protection, Competition, and Fraud Repression Directorate General (CCF)														Cambodia	PU, World Veg, RUA, ITC, KSU, PSU
Activity 1.4: Conduct a gender analysis and implement women and youth engagement activities, including a Women's Leadership Program in rural communities															
1.4.1 With guidance from the Gender Advisor, develop and conduct a Gender Analysis of farms and markets where research will be conducted														Cambodia	KSU, PU, CE SAIN, RUA, ITC
1.4.2 Identify students at RUA and ITC to participate in the Women's Leadership Program and pair them with female farmers in Siem Reap and Battambang based on interests														Cambodia	KSU, PU, CE SAIN, RUA, ITC
1.4.3 Initiate and conduct community-level food safety showcase development projects														Cambodia	KSU, PU, CE SAIN, RUA, ITC
1.4.4 Develop curriculum and design training programs for young food safety scientists														Cambodia	KSU, PU, PSU, RUA, ITC

Bangladesh: FY2022 Work Plan for the Feed the Future Innovation Lab for Food Safety

Objectives, Activities and Sub-Activities	Timeline of Activity (October 1, 2021 - September 30, 2022 - FY2022)												Country and Location(s) of Activity	Person or Institution Responsible	
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep			
Objective 1: Enhancing Food Safety in Fish and Chicken Value Chains of Bangladesh (Bangladesh Long-Term Subaward)															
Activity 1.1: Analysis of the Knowledge, Attitude and Practices (KAPs) regarding food safety and risk issues related to fish and selected frozen chicken products in a gender and age segregated representative sample of Bangladeshi consumers and major value chain actors; develop training module on food safety															
1.1.1 Implement survey design and administration to measure the KAPs towards food safety amongst farmers, intermediaries, wholesalers, processors, retailers, and consumers														USA/Bangladesh	TXST, BAU, DU
1.1.2 Conduct sampling for food hazard levels along the fish and chicken value chains														Bangladesh	TXST, BAU
1.1.3 Conduct analysis of antibiotic residues, bacterial pathogens and heavy metals for samples collected in Activity 1.1.2														Bangladesh	TXST, BAU
1.1.4 Design and host focus group discussions with value chain actors, including women consumers and traders from both supermarkets and wet markets, to study the gap between expressed norms and actual														Bangladesh	BAU, DU
Activity 1.2: Estimation of the Bangladeshi consumers' willingness to pay (WTP) for a general reduction in exposure to potentially harmful microorganisms and chemicals, and for safety certification in fish and															
1.2.1 Implement the first two stages of the hedonic analysis, which includes surveying retail outlets (wet markets and stores) to evaluate the range of fish and chicken products available in retail markets as well as cataloguing the characteristics, including safety attributes, of the surveyed product														USA/Bangladesh	TXST, BAU
1.2.2 Design experimental auctions (aligned with the Vickrey auction model) to assess consumers' WTP for safer fish products														USA/Bangladesh	TXST, BAU
1.2.3 Recruit participants for the experimental auctions in wet markets, grocery stores, and shopping centers of Mymensingh, Dhaka, and Patuakhali														Bangladesh	TXST, BAU
1.2.4 Initiate experimental auctions to assess consumers' WTP for safer fish products														Bangladesh	TXST, BAU

Kenya: FY2022 Work Plan for the Feed the Future Innovation Lab for Food Safety

Objectives, Activities and Sub-Activities	Timeline of Activity (October 1, 2021 - September 30, 2022 - FY2022)												Country and Location(s) of Activity	Person or Institution Responsible	
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep			
Objective 1: Chakula salama: a risk-based approach to reducing foodborne disease and increasing production of safe foods in Kenya (Kenya Long-Term Subaward)															
Activity 1.1: Identify, in collaboration with stakeholders, food safety priorities for poultry value chains in Kenya using a risk-informed approach															
1.1.1 Conduct a gender analysis of the poultry value chains in Kiambu County, Kenya to determine the roles of men, women, boys and girls in the poultry value chain and who is most impacted by food safety														USA/Kenya	UF, KEMRI
1.1.2 Conduct a facilitated scoping workshop to define the scope and purpose of the risk ranking as well as identify available interventions and sources of information														USA/Kenya	OSU, KEMRI
1.1.3 Collect and analyze data on identified hazards and mitigation strategies through a literature review and results from Activities 1.1.1 and 1.1.2														USA/Kenya	OSU, KEMRI
1.1.4 Conduct risk ranking workshop to prioritize potential risk management interventions for mitigating Salmonella and Campylobacter in the poultry value chain														USA/Kenya	OSU, KEMRI
Activity 1.2: Characterize Salmonella (SALM) and Campylobacter (CAMPY) contamination in poultry chains managed by women and youth farmers in the peri-urban areas of Kenya															
1.2.1 Develop protocols for cross-sectional microbiological surveys to estimate prevalence of Salmonella and Campylobacter in poultry products in Kiambu County														Kenya	OSU, KEMRI
1.2.2 Develop and conduct microbiological trainings														Kenya	OSU, KEMRI
1.2.3 Conduct microbiological surveys in conjunction with Activity 1.3 evaluation studies pre- and post-intervention														Kenya	KEMRI, UN
1.2.4 Analyze samples and estimate prevalence and levels of Salmonella and Campylobacter in poultry products in Kenya														USA/Kenya	OSU, KEMRI
Activity 1.3: Develop and evaluate the efficacy of culturally and gender appropriate, practical, and scalable intervention strategies for mitigating risk of SALM and CAMPY in poultry that effectively															
1.3.1 Select, in collaboration with stakeholders, one to two gender-specific and culturally appropriate interventions (identified in Activity 1.1) for evaluation														USA/Kenya	OSU, UN
1.3.2 Develop study protocols and survey instruments, obtain appropriate IRB approvals, field test survey instruments and train field workers														USA/Kenya	OSU, UN
1.3.3 Recruit study participants, provide training on selected interventions and conduct pre- and post-intervention assessments														Kenya	UN, KEMRI
Activity 1.4: Estimate the public health impact and evaluate the benefits and costs from selected intervention strategies to inform public and private decision-making															
1.4.1 Estimate the burden of SALM and CAMPY in Kenya attributed to poultry using a top-down approach and country-specific FERG data														USA/Kenya	UF

Senegal: FY2022 Work Plan for the Feed the Future Innovation Lab for Food Safety

Objectives, Activities and Sub-Activities	Timeline of Activity (October 1, 2021 - September 30, 2022 - FY2022)												Country and Location(s) of Activity	Person or Institution Responsible	
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep			
Objective 1: Food Safety Capacity Building in Senegal: Enhancing Resilience of the Dairy Value Chain by Leveraging Public-Private Partnerships (Senegal Long-Term Subaward)															
Activity 1.1: Raise awareness of stakeholders on food safety issues and their impact on public health															
1.1.1 Develop communication tools including customized materials to reach women and youth groups in the food value chain continuum and raise awareness on food safety and upcoming FSIL activities related to the dairy value chain														USA/Senegal	UGA, TU, ITA, ISRA, CLM
1.1.2 Identify a comprehensive list of actors engaged in the production-processing-distribution continuum of the dairy value chain and solicit their participation in future project activities														Senegal	ITA, ISRA, CLM
1.1.3 Conduct in-person training workshops with value chain actors that focus on basic food safety practices and the importance of food safety to public health as it relates to the dairy value chain														Senegal	UGA, TU, ITA, ISRA, CLM
Activity 1.2: Conduct food safety-enhancing research complemented with training programs to develop capacity															
1.2.1 Design and conduct research for the dairy value chain, that includes, but is not limited to: chilling and pasteurization at aggregation points to minimize microbial deterioration of milk, evaluating and standardizing pasteurization parameters for adoption by SMEs, and optimizing fermentation parameters														Senegal	ITA, ISRA in collaboration with UGA and TU
1.2.2 Develop short-term capacity building training, accreditation, and certification processes for scientists, graduate students, and entrepreneurs as a complement to Activity 1.2.1														Senegal	ITA, ISRA in collaboration with UGA and TU
Activity 1.3: Provide the food industry with knowledge on cost-benefit propositions for implementing food safety interventions															
1.3.1 Include and research gender as it relates to improving food safety of the dairy value chain														USA/Senegal	UGA, ISRA, CLM
1.3.2 Conduct cost-benefit analysis studies for the implementation of food safety interventions for women, men, young people, and entrepreneurs (individuals and SMEs) in the formal and informal sectors (based on Activity 1.2)														USA/Senegal	UGA, ITA, ISRA
Activity 1.4: Coordinate development and implementation of comprehensive food safety regulations aligned with government policies															
1.4.1 Collate the current food safety policies/ regulations in the dairy value chain, focusing on the areas of 1) production, 2) processing, and 3) youth and women in the dairy value chain														USA/Senegal	UGA, ITA, ISRA, TU
1.4.2 Identify constraints and gaps in current food safety policies/ regulations in the dairy value chain														USA/Senegal	ITA, ISRA, CLM

Acronym	Full Name
BAU	Bangladesh Agricultural University
CCF	Consumer Protection, Competition, and Fraud Repression Directorate General
CESAIN	Center of Excellence on Sustainable Agricultural Intensification and Nutrition
CLM	Cellule De Lutte Contre La Malnutrition
DU	University of Dhaka
IBC	Institutional Biosafety Committee
ILRI	International Livestock Research Institute
IPC	Institut Pasteur du Cambodge
IRB	Institutional Review Board
ISRA	Institut Sénégalais de Recherches Agricoles
ITA	Institut de Technologie Alimentaire
ITC	Institute of Technology Cambodia
KAPs	Knowledge, Attitude and Practices
KEMRI	Kenya Medical Research Institute
KSU	Kansas State University
NISTI	National Institute of Science, Technology and Innovation
OSU	The Ohio State University
PSU	Penn State University
PU	Purdue University
RUA	Royal University of Agriculture, Cambodia
TU	Tuskegee University
TXST	Texas State University
UF	University of Florida
UGA	University of Georgia
UN	University of Nairobi
USAID	United States Agency for International Development
World Veg (WV)	World Vegetable Center