CENTER FOR FOODBORNE ILLNESS RESEARCH AND PREVENTION

IMPACT REPORT
2019–2020

THE Ohio State University
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES
Letter From the Director

Dear CFI Colleagues and Friends,

Fifteen years ago, in 2005, my mom and I co-founded the Center for Foodborne Illness Research and Prevention (CFI) as a national 501(c)(3) nonprofit organization dedicated to preventing foodborne disease and advancing science-based, evidence-informed solutions for the food safety challenges of the 21st century. Two years ago, in 2019, CFI transitioned to The Ohio State University as a center within the College of Food, Agricultural, and Environmental Sciences (CFAES). Importantly, CFI’s vision and mission remain the same.

Since our inception, CFI has been dedicated to improving food safety and advancing “one health” by creating synergies, fostering interdisciplinary collaborations, and facilitating the translation of research into policy and practice. During our time so far at Ohio State, we have expanded these efforts in new and exciting ways. For example, prior to joining Ohio State, our ability to conduct research was limited by our size. As you will read in the coming pages, in just two years, we have been awarded seven new research projects ranging from working with local public health agencies on retail food safety to helping countries in Africa develop risk-based food safety systems. One of the most satisfying aspects of bringing CFI to Ohio State has been our ability to build human and institutional capacity around food safety.

In particular, we have engaged over 20 international and domestic undergraduate and graduate students in our work. We have highlighted some of their stories throughout this report. Seeing these young scientists—the next generation of food safety workforce—leading research activities, providing feedback to policymakers, and engaging in stakeholder discussions on important food safety issues is amazing to watch. As our first students begin to graduate, I am looking forward to seeing where their careers take them.

We are excited about our future at Ohio State and plan to grow our research, education, and outreach efforts. We recently established an External Advisory Committee to provide feedback on where to focus our efforts and to serve as collaborators so that we can maximize our impact. Members of this committee were selected to represent the breadth of stakeholders and depth of knowledge needed to drive change and supplement the expertise of CFI’s Steering Committee. Of course, as our programs grow, so do our financial needs. Thanks to our generous donors, an endowment has been established at The Ohio State University Foundation for CFI. Interest from this endowment will provide a sustainable funding source for CFI going forward, so growing it is important to our continued success.

We thank everyone who has donated to this effort and hope others will follow their lead in helping us improve food safety.

Food safety is a critical global issue that sickens hundreds of millions of people each year, resulting in substantial economic losses and continued food insecurity. Together, we can make a difference in addressing this critical problem.

Best,

Barbara Kowalcyk, PhD
Director, Center for Foodborne Illness Research and Prevention

Vision and Mission

Our vision is a food system that consistently delivers safe, affordable, and nutritious food.

Our mission is to advance food safety systems that protect public health by preventing foodborne illness.

Strategic Objectives

Create and Discover Knowledge Through Research and Innovation
- Contribute to the body of knowledge about food safety and foodborne illness.
- Advance innovative, science-based solutions to food safety challenges.

Translate and Exchange Knowledge Through Outreach and Advocacy
- Translate knowledge into evidence-based food safety policies and practices.
- Collaborate with stakeholders to promote systems-based approaches to food safety.

Prepare Leaders and Engaged Citizens Through Teaching and Learning
- Engage stakeholders in identifying and solving important food safety problems.
- Deliver high-impact educational programs that meet the needs of the food safety workforce.

Ensure Our Future Success Through Responsible Stewardship
- Effectively utilize our resources to improve food safety on behalf of the public.
- Develop and implement strategies that ensure the sustainability of CFI’s work.
Foodborne disease (FBD) is an important public health problem in low- and middle-income countries (LMIC), causing considerable morbidity and mortality and, thus, having a substantial social and economic impact. Our international research currently focuses on raw beef and dairy in Ethiopia, poultry production in Kenya, and maize in Guatemala.

**TARTARE: The Assessment and Management of Risk From Non-Typhoidal Salmonella, Diarrheagenic Escherichia coli, and Campylobacter in Raw Beef and Dairy in Ethiopia**

TARTARE addresses important knowledge gaps in understanding how to estimate the burden of FBD in LMIC and develop cost-effective, gender-sensitive and socio-culturally appropriate approaches for mitigating the impact of FBD, with the goal of improving food safety governance. A key deliverable will be a risk-based, decision-making roadmap for food safety interventions in Ethiopia. The roadmap is adaptable for other LMIC with similar food systems.

**Collaborators:** Ohio State, University of Florida, International Livestock Research Institute, GOH LLC, Ethiopian Public Health Institute, University of Gondar, Haramaya University

**Timeline:** November 2018–October 2023

**Funding Sources:** Bill and Melinda Gates Foundation (BMGF) and the United Kingdom’s Foreign, Commonwealth and Development Office (FCDO)

**Chakula Salama: A Risk-Based Approach to Reducing Foodborne Disease and Increasing Production of Safe Foods in Kenya**

Chakula Salama, which means “safe food” in Swahili, will develop Kenya’s capacity to implement systems-based, risk-informed approaches to food safety that reduce the risk of FBD, increase the production of safe food, and improve economic outcomes. To demonstrate this approach, we will focus on mitigating the risk of Salmonella and Campylobacter in small-scale poultry production in peri-urban areas of Kenya.

**Collaborators:** Ohio State, University of Florida, University of Gondar, Haramaya University

**Timeline:** October 2020–March 2024

**Funding Sources:** USAID and the Food Safety Innovation Lab as part of Feed the Future, the U.S. Government’s global hunger and food security initiative

**PESAR: Estimating Mycotoxin Exposure and Increasing Food Security in Guatemala**

Mycotoxins are toxic fungal metabolites that contaminate about a quarter of the world’s food and can cause serious health outcomes such as cancer, stunting, and wasting. PESAR will inform the development and implementation of supply chain management practices that mitigate mycotoxin production, reduce food waste and economic loss, and promote food security. Specifically, PESAR will conduct a cross-sectional survey to estimate the prevalence of aflatoxins in maize and tortillas in Guatemala.

**Collaborators:** Ohio State, Laboratorio Diagnóstico Molecular

**Timeline:** April 2019–March 2022

**Funding Sources:** Ohio State Connect and Collaborate Grant, Laboratorio Diagnóstico Molecular, Rotary International, World Bank

**Guatemala Experiential Learning Trip, March 2020**

“Attending the Guatemala trip was a one-of-a-kind learning experience. We were allowed to immerse in the culture while learning, observing, and comparing food safety and security measures.”

—Gary Closs Jr., PhD candidate (top row, second from right)
CFI strives to allow its students opportunities to lead research projects whenever possible. In 2020, CFI team member Brian Landers, a senior in the CFAS Department of Food Science and Technology, designed and implemented a research study that examined the food safety knowledge, attitudes, and practices of volunteers working in food distribution organizations.

Adding Value to Microbiological Sampling: Study Design and Statistical Methods for Food Safety

Microbiological testing of food plays an important role in verifying that food safety systems are working as intended. Samples are used to characterize and draw conclusions about the presence of pathogens in food. This project uses the U.S. Department of Agriculture Food Safety and Inspection Service (FSIS) data to explore ways to improve microbiological sampling and regulatory decision-making through applied statistical methods and study design.

**Collaborators:** Ohio State, USDA Food Safety and Inspection Service

**Timeline:** January 2020–June 2021

**Funding Sources:** CFI and the USDA Food Safety and Inspection Service Research Participation Program administered by the Oak Ridge Institute for Science and Education (ORISE) through an interagency agreement between the U.S. Department of Energy and the National Institute of Environmental Health Sciences

CONTACT: Scientific Challenges and Cost-Effective Management of Risks Associated With Implementation of Produce Safety Regulations

CONTACT, a USDA-funded project led by the University of Florida, will provide a systems-based decision-support framework to evaluate measures for controlling pathogens on produce that will support an integrated view and decision-making roadmap for stakeholders. CFI will contribute to the development of risk assessment models and burden of disease estimates, and will lead the development of a framework for sharing public and private-sector data.

**Collaborators:** Ohio State, University of Florida, Rutgers University, Washington State University, University of Georgia, University of California-Davis, University of Maryland, University of Delaware, Virginia Tech, University of Arizona, USDA Agricultural Research Service

**Timeline:** Sept. 15, 2020–Sept. 14, 2024

**Funding Source:** USDA Specialty Crop Research Initiative

FAIRE: Franklin County Public Health Practice-Based Research to Identify and Prevent Environmental Risk Factors Contributing to Foodborne Illnesses

Certified food protection managers (CFPMs) are increasingly recognized for their role in addressing foodborne illness risk factors in retail food environments. However, few studies have examined how food safety certification requirements might influence food safety outcomes. FAIRE will utilize regulatory inspection data and supplemental questionnaires to gain a better understanding of how CFPMs impact foodborne illness risk factors in food service operations and retail food establishments.

**Collaborators:** Ohio State, Franklin County Public Health

**Timeline:** October 2020–September 2025

**Funding Source:** U.S. Centers for Disease Control and Prevention

Addressing the food safety challenges of the 21st century requires an integrated, systems-based approach that is rooted in science and driven by risk. CFI works to link public health information with data from across the food system to evaluate risks and potential intervention strategies, and provide informatics tools that facilitate timely decision-making.

**CONTACT: Student Spotlight**

**Aaron Beczkiewicz**

PhD Candidate, Food Science and Technology, The Ohio State University

“While my time at Ohio State will soon be coming to a close, I know my experiences and connections I have made through CFI—including my time spent as a graduate food safety fellow with FSIS’ Research Participation Program (ORISE)—will continue to shape my future in food safety as I begin my career as a food technologist with FSIS.”

**Devon Mendez**

MPH Student, Veterinary Public Health, The Ohio State University

“As part of Dr. Kowalcyk’s team, I have participated in a variety of projects including the completion of my practicum. Recently, my main role has been working on the FAIRE project, which has involved collaborating with Franklin County Public Health employees to develop a study evaluating the effect of CFPMs on critical health violations in food establishments. As part of this project, I have played an integral part in the survey development, IRB submission, and a variety of other tasks to help develop this study.”
Increasing Our Knowledge About Foodborne Illnesses

Since epidemiology guides prevention and drives risk-based decision-making around food safety, CFI’s work has focused on expanding the understanding of foodborne diseases and their health impacts. Given our expertise in data analytics, much of these efforts have focused on novel uses of existing data sources.

**SHARE: Developing Methods for Assessing the Public Health Impact of Foodborne Illnesses Using Electronic Medical Records**

Electronic medical records can provide significant insights into patient outcomes but have not been widely used for foodborne disease. SHARE is utilizing electronic medical data from the Ohio State health care system to improve understanding of diagnostic practices around foodborne diseases, the trends in incidences of foodborne diseases in Ohio, and the risks of developing long-term health outcomes associated with acute foodborne diseases.

**Collaborators:** Ohio State CFAES, Ohio State College of Education and Human Ecology, Ohio State College of Medicine

**Timeline:** June 2020–May 2022

**Funding Source:** Ohio State Team Science SEEDS Grant

**Characterizing Long-Term Health Outcomes and Health-Related Quality of Life Among Families Affected by Hemolytic Uremic Syndrome (HUS)**

Foodborne pathogens can lead to acute and chronic illnesses, but little is known about the psychosocial costs to the individuals sickened and their families. To fill this knowledge gap, we surveyed families of individuals who developed HUS, a serious complication that can develop during acute foodborne disease. Results will improve the burden of disease estimates as well as clinical management of HUS patients.

**Collaborators:** Ohio State CFAES, Ohio State College of Education and Human Ecology

**Timeline:** October 2018–October 2020

**Funding Source:** CFI

Student Spotlight

**Drew Barkley**
PhD Student, Food Science and Technology, The Ohio State University

“Working on the SHARE project has helped me to hone my data-cleaning, quality assurance, and coding skills. Given my background in public health, I am grateful for the opportunity to continue to develop as an epidemiologist and a biostatistician using real-world data to address actual issues within food safety. After graduating, I hope to continue similar work as a food safety epidemiologist in the federal government.”

**Chris Yao**
Undergraduate Student, Computer Science and Engineering, The Ohio State University

“As an aspiring computer scientist, the SHARE project really gave me an eye-opening experience working with vast amounts of data from a real-world setting. Not only was I able to gain invaluable programming skills and knowledge of the food safety world, but I also had the opportunity to apply my knowledge in computer science to help and impact food safety.”
At CFI, we view ourselves as knowledge brokers who translate science into practical, evidence-informed policies and practices. Bridging the research-policy-practice gap is a core focus of CFI’s work. The research we undertake, the classes we teach, and the outreach we do are all driven by identified gaps in food safety policies and practices. In fact, outreach and public service have been the core of CFI’s activities since its founding in 2006.

Collaborating With Stakeholders to Promote Systems-Based Approaches to Food Safety

Stakeholder engagement plays a critical role in CFI’s efforts to translate research into policy and practice. To facilitate this, we have established an External Advisory Committee, and we regularly host events to encourage interactions among stakeholder groups. For example, in 2019, CFI held its inaugural event, which brought together over 100 food safety professionals to explore the most crucial food safety issues facing the nation and the world. More recently, CFI hosted a webinar on the impact of COVID-19 on food safety systems. We plan to expand these efforts in the coming year.

Translating Knowledge Into Evidence-Based Food Safety Policies and Practices

CFI regularly engages with decision-makers from the public and private sectors to understand their needs and promote the development of sound food safety policies and practices. For example, CFI members serve on several national advisory committees, including the National Advisory Committee on Meat and Poultry Inspections. CFI also provides input to the USDA and the FDA through the public comment process that federal agencies are required to undertake before new rules are implemented. For example, in 2020, CFI submitted public comments on a petition to declare *Salmonella* an adulterant and produce commodities that are rarely consumed raw. A complete list of CFI public comments can be found on our website. Finally, as part of the Safe Food and Make Our Food Safe Coalitions, CFI meets regularly with federal food safety agencies to exchange information and discuss important food safety issues. We also participate in several national and state advisory committees, including the FDA Science Board and the Ohio Retail Food Service Advisory Council.

Allison Howell
PhD Student, Food Science and Technology, The Ohio State University

“One of my first projects after joining CFI was helping to draft comments on the consumption of certain uncommon produce commodities in the United States. I hadn’t been familiar with the public comment process before joining this project, and I learned so much—not just about the science specific to the proposed rule change, but also about how I, as a scientist and researcher, can join the conversation and use my knowledge and experience to help inform governmental decision-makers and to advance policies to best ensure safe food for all.”

Michala Krakowski
Undergraduate Student, Microbiology, The Ohio State University

“I am currently working on the development of a supplemental data collection form for the FAIRE project, which examines the connection between food safety certification and food safety knowledge and compliance with the Ohio food code. The results from this survey will help us gain a better understanding of foodborne illness risk factors in retail food environments.”
Building Workforce Capacity Through Short Courses

Time is valuable, especially if you are already in the workforce or live in an area where training opportunities are limited. Short courses provide flexible opportunities to learn new skills and ways of thinking about food safety. CFI regularly engages in short courses offered through Ohio State's One Health Summer Institute (OHSI) and has trained over 200 individuals globally in the past two years. Our short course offerings include Epidemiology of Foodborne and Zoonotic Diseases; Risk Assessment and Risk Ranking; Introduction to Data Analytics, Statistics, and Programming in Epidemiologic Research; and Foodborne Disease Surveillance and Outbreak Investigations.

Interdisciplinary Colloquium on Food Safety

In 2020, we collaborated across four Ohio State colleges to offer a new one-credit graduate seminar that exposes students to current and emerging topics in food safety. The course, which is currently offered during autumn and spring terms, features guest speakers from industry, academia, and government. When possible, seminars are open to anyone with an interest in food safety.

Experiential Learning

Nothing facilitates deep learning more than doing. As such, we at CFI strive to engage students in all of our work, matching them to projects that they are passionate about and giving them opportunities to explore the many different aspects of food safety work. Our goal is to provide students with practical experiences in food safety. To date, projects have ranged from conducting literature reviews, analyzing data, developing responses to federal register notices, and conducting immersive research experiences in other countries.

Preparing Leaders and Engaged Citizens

Developing the next generation of food safety professionals is one of our top priorities at CFI. But being a domain expert isn’t enough. Food safety professionals have to be innovators, collaborators, systems thinkers, communicators, boundary-crossers and rigorous scientists. We use a multipronged approach at CFI to train translational scientists in food safety, including academic courses, short courses, and experiential learning. Some of our efforts are highlighted below.

Vanora Davila

MPH Student, Epidemiology, The Ohio State University

“Through my practicum experience, I helped design and submit an IRB application for a research project, where I also conducted interviews and performed a thematic analysis to identify gaps and misconceptions in student knowledge regarding COVID-19 and protective behaviors. Working on this project helped instill an appreciation for the importance of collaboration and science-based approaches to problem-solving strategies and research.”

Amete Mihret Teshale

PhD Student, Medical Microbiology, Addis Ababa University

“My experience with the TARTARE project, under close mentorship from Dr. Kowalcyk, has allowed me to use my expertise in microbiology to improve food safety and epidemiology for my country, Ethiopia. I also attended the One Health Summer Institute Epidemiology and Research Methodology Training as well as the Risk-Ranking and Prioritization Workshop, which have helped prepare me to take on a leadership role after graduation.”
2019–2020 CFI Team

Staff
Barbara Kowalcyk, Assistant Professor and Director
Kara Morgan, Associate Director
Nasandra Wright, Program Manager
Ashley Cellar, Program Coordinator

Affiliates
Patricia Buck, CFI Co-Founder
Tanya Roberts, Economic Research Service/USDA (Retired)
Teresa Schwartz, Consumer Advocate

Students
Aaron Becklewicz, PhD Candidate, Food Science and Technology
Drew Barkley, PhD Student, Food Science and Technology
Ariel Garsow, PhD Student, Food Science and Technology
Allison Howell, PhD Student, Food Science and Technology
Vanora Davilla, MPH Student, Epidemiology*
Kara Galvan, MPH Student, Epidemiology*
Hilary Kordecki, MPH Student, Veterinary Public Health*
Melanie Lopez, MPH Student, Veterinary Public Health*
Devon Mendez, MPH Student, Veterinary Public Health*
Zain Ball, Undergraduate Student, Public Health*
Ashley Crawford, Undergraduate Student, Public Health*
Cameron Jordan, Undergraduate Student, Food Science and Technology
Michala Krakowski, Undergraduate Student, Microbiology
Brian Landers, Undergraduate Student, Food Science and Technology*
David Tan, Undergraduate Student, Computer Science and Engineering*
Betsy Wang, Undergraduate Student, Applied Physics*
Chris Yao, Undergraduate Student, Computer Science and Engineering*

Steering Committee
Michael S. Blaisl, Senior Associate Dean of Ohio State College of Public Health/Director of Academic Affairs/Professor, Interim Chair Environmental Health Sciences
Wondwossen Gebreyes, Executive Director of GOHi, and Professor, Ohio State Department of Veterinary Preventive Medicine
Armando Huet, Professor, Director of Ohio State Veterinary Public Health Program
Sanja Ilic, Associate Professor, Ohio State Department of Human Sciences
Julie Mangino, Professor Emeritus, Ohio State Department of Internal Medicine, Division of Infectious Diseases
Qiuhong Wang, Associate Professor, Ohio State Center for Food Animal Health, Department of Animal Sciences, and Department of Veterinary Preventive Medicine
Ahmed Youset, Professor, Ohio State Department of Food Science and Technology and Department of Microbiology

External Advisory Committee
John Barker, Ohio Restaurant Association, Columbus, OH
Elizabeth Duncan, Nationwide Insurance Company, Columbus, OH
Dan Engeljohn, United States Department of Agriculture (Retired)
Arie Havelaar, University of Florida, Gainesville, FL
Sean Leighton, Cargill, Wayzata, MN
Bill Marler, Marler Clark LLP, Seattle, WA
Jean Menke Schaenzer, Van Drunen Farms, Monee, IL
Mary Angela Miller, Protect Your Plate, Columbus, OH
Gina R. Nicholson Kramer, Food Safety Expert, Columbus, OH
Howard Popoola, The Kroger Company, Cincinnati, OH
Kim Quinn, Ohio Department of Health (Retired)
Mark Riddle, University of Nevada School of Medicine, Reno, NV
Fabien Robert, Nestlé Quality Assurance Center, Dublin, OH
Caroline Smith DeWaal, Global Alliance for Improved Nutrition (GAIN), Washington, DC
Caren Wilcox, Government (Retired)
Sharon Wood, H-E-B Company, San Antonio, TX

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information, visit cfaesdiversity.osu.edu.
For an accessible format of this publication, visit cfaes.osu.edu/accessibility.