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Research Areas

- Agent Behavior
- Cyber Security
- Event Modeling
- Information Sharing
- Risk Analysis
- Supply Chain Security
- System Strategies

"In the old days, agriculture meant feeding Minnesota. Today it means feeding the world and protecting the planet's food supply from disease and determined terrorists; our federally funded National Center for Food Protection and Defense does just that."

- Eric Kaler
President
University of Minnesota

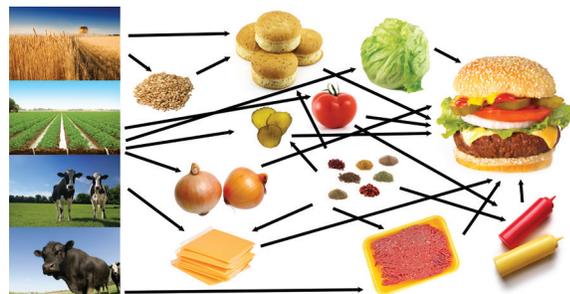
Mission: *To defend the safety of the food system through research and education.*

Quick Facts

- The consortium is led by the University of Minnesota.
- NCFPD is a network of more than 140 academic, industry, and government experts who conduct cutting-edge food defense research.
- Research topics include supply-chain management, logistics, epidemiology, public health, risk assessment, risk management, economics, molecular biology, food microbiology, food science, food chemistry, food systems, food engineering, biomedical engineering, toxicology, and risk communication.
- NCFPD meets the specific mandate for a university-based food protection and defense center in Homeland Security Presidential Directive 9, Defense of United States Agriculture and Food (January 2004).

Key Accomplishments

- Developed CoreSHIELD, a communication, coordination and training platform that houses web portals for the food and agriculture sector, connecting over 30,000 federal, state and local authorities, private sector representatives, and international partners. The platform has participation from labs and regulatory agencies in all 50 states. Over 1,000 webinars, seminars, and regularly occurring meetings are held on this infrastructure annually, logging more than 64,000 minutes each month.
- Advanced development of seven novel sensors that will detect threat agents in foods at near real-time (e.g., E. coli, B. anthracis, Potassium cyanide, Ricin, Salmonella Enteritidis).
- Provided a number of educational opportunities, including food defense training for government agencies (local, state, federal, and international), academia, and industry.
 - Offered undergraduate and graduate student opportunities that provide for holistic food defense education experiences: development of two graduate level food defense courses at the University of Minnesota: VMED 5920 – *Food Defense: Prepare, Respond, Recover* and VMED 5921 – *Seminar in Food Protection and Defense*; support of students through our Career Development Workforce Development Grants.
- Developed risk communication best practices, key messages and delivery methods for before, after and during a foodborne outbreak, which have been used by the Centers for Disease Control, Dairy Management Inc., and various food firms responding to food outbreaks.



Research Partners

Alabama A&M University
Association of State and Territorial Health Officials
Gryphon Scientific
Institute of Food Technologists
Kansas State University
National Association of County and City Health Officials
North Carolina Department of Agriculture and Consumer Services
Risk Sciences International
U.S. Pharmacopeial Convention
Universidad del Este
University of Massachusetts, Amherst
University of Minnesota
University of Texas, San Antonio
Whittier College Georgia Institute of Technology

Federal Partners

Department of Homeland Security

- Chemical Security Analysis Center
- Customs and Border Protection
- Office of Health Affairs
- Office of Infrastructure Protection
- Office of Policy
- Science and Technology Directorate

Department of Agriculture

- Animal and Plant Health Inspection Service
- Food Safety and Inspection Service
- Foreign Agriculture Service

Centers for Disease Control and Prevention

Department of Defense

Food and Drug Administration

- Office of Regulatory Affairs
- Center for Food Safety and Applied Nutrition

NCFPD Highlights

Criticality Spatial Analysis (CRISTAL)

NCFPD is testing CRISTAL, user-friendly software in development to be compatible with cloud-based or enterprise systems. This will enable private food companies and the government to compare disparate food systems. The Food Safety Modernization Act (FSMA) places an increased emphasis on supply chain documentation, product tracing, and event response. CRISTAL could be one tool that helps companies accomplish these tasks. CRISTAL facilitates private food companies' efforts to improve understanding of their risks and allocate scarce security and risk mitigation resources, in order to increase the safety and security of global food systems.



Laser to Detect Food Contamination

NCFPD researchers are developing a field and forensic application of Raman Spectrometry to detect contaminants in food (i.e., adulterants) food from a safe, non-contact distance of 1–10 meters. To demonstrate the viability of the system, this project will target contaminants commonly found in economically motivated adulteration use cases: melamine in milk, calcium carbonate in flour, and inferior olive oil substitutes.

Economically Motivated Adulteration (EMA) Research

NCFPD EMA research has helped to define the scope, drivers, and methods of EMA in food products. NCFPD researchers maintain an online, searchable database of documented incidents of EMA for use by food protection stakeholders. EMA research efforts also include the development of methods for early identification of supply chain anomalies in imported food products, study of the prevalence of fish fraud and the vulnerable points in the supply chain, and development of vulnerability assessment methods. This work has been cited by FDA in proposed FSMA rules and in a Congressional Research Service report.



Risk Mitigation and Food Supply Chain Design and Control

NCFPD researchers are developing improved risk analysis approaches for U.S. food products that use imported ingredients. Research efforts include creating new supply-chain design and sequential control strategies that seek to ensure a high level of system productivity while mitigating the risk posed by intentional attacks by adversaries.

Focused Integration of Data for Early Signals (FIDES) Project

The FIDES project will allow for the focused integration of data to provide a comprehensive, systematic process for monitoring potential food threats and identifying adverse food events. The project will analyze and monitor data from diverse platforms including trade, weather, crises and disasters, import refusals and global food production to predict and identify food disruption events as they begin.