



**Journal  
of the  
Association of Food and Drug Officials**

*Serving the regulatory community since January 1937*

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Adjunct Faculty, Michigan State University

## AFDO Welcomes Cohort IV Joseph Corby, AFDO Executive Director

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AFDO is pleased to welcome Cohort IV to the AFDO Annual Conference, and we invite you to review the research projects they have completed. The Fellowship for Food Protection program has once again produced the food safety leaders of tomorrow who will help to guide our profession and association through the continuing challenges we all face.

This year's Fellows have produced some very important and instrumental projects, and they will provide a report on these projects at our Annual Conference in Indianapolis, Indiana. And once again, a Special Edition of the AFDO Journal is being dedicated to the current Cohort IV and their special projects. I hope everyone is able to hear the Fellows provide their project presentations at our Committee meetings and that you have the opportunity to visit with the Fellows during the Monday afternoon Poster Session we have planned. AFDO is extremely happy with the impact the Fellowship program and research projects have had on our organization. We offer our congratulations and sincere gratitude to all the Fellows from Cohort IV.

I also want to take this opportunity to thank the AFDO Endowment Foundation for their generous contribution to the Fellows by providing travel funding so they may attend the Annual Conference.

The International Food Protection Training Institute (IFPTI) continues to seek out individuals with leadership potential and expose them to career experiences that are designed to develop that potential. The Fellowship Program not only builds leaders, but it builds AFDO as well. For this we are very thankful.

## ***About the Fellowship in Food Protection***

**Gerald Wojtala, Executive Director of IFPTI**

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This special edition of the AFDO journal highlights the research conducted by Cohort IV of the Applied Science, Law, and Policy: Fellowship in Food Protection created by IFPTI in 2011. The Fellowship Program was created in order to help foster the integrated food safety system in the U.S., as called for by the Food Safety Modernization Act 2011.

The Fellowship is open to individuals who 1) perform food protection regulatory functions at the federal, state, local, tribal, or territorial level; 2) have at least four years of experience in the food regulatory field; and 3) have completed the FDA ORAU Level 1 retail or manufactured foods curriculum. Prospective Fellows go through a rigorous application process and are evaluated closely before being accepted into the program. Cohort IV represented a good mix of food safety professionals from state and local regulatory agencies.

The Fellowship comprises three week-long, seminar-style sessions, held during a one-year period and taught by recognized leaders in food protection. The courses cover topics such as Food Law, Compliance, Food System Control Applications, and the Impact of Science.

Along with this coursework, Fellows also develop and conduct - in collaboration with their mentors - a research project designed to advance a specific topic related to food safety. After conducting their research, Fellows write a journal-quality article (published in this issue) and create a poster and PowerPoint presentation specifically for the AFDO Annual Educational Conference.

Throughout the entire history of the Fellowship Program, assessment tools and evaluation mechanisms have been implemented to ensure continuous improvement to the program. Input and feedback is obtained from the Fellows, the instructors, and other external stakeholders. Modifications and improvements to the Fellowship over the years have included the addition of instructor-mentors, increasing the opportunities for the Fellows to deliver oral presentations to their peers, the addition of brown bag webinars, the implementation of assessments and resources using a learning management system, and updates to course modules.

All of us at IFPTI are very proud of the success of the Fellows, and we look forward to welcoming Cohort V later in 2015.

## ***Meet the Instructors and Mentors***

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The Fellowship program's instructors and mentors are professionals with extensive food protection experience. Responsible for teaching the seminars, providing experienced insight, and guiding Fellows in their individual research projects throughout the year, IFPTI's experienced instructors are the crux of the Fellowship program. Additional instructors and guest lecturers also provide experience and insight into specific areas of study. Below are the Fellowship's official program instructors and mentors.



**Dr. Joanne M. Brown, DVM, MS, DACVPM, DNAP** has over 42 years of experience in food safety, animal disease, public health, and emergency preparedness. A graduate of the University of Minnesota's College of Veterinary Medicine, she also has a master's degree in veterinary microbiology from Texas A&M University, and is a Diplomat in the American College of Veterinary Preventive Medicine and a Distinguished Practitioner of the National Academies of Practice (retired).

She spent over 26 years in the Army Veterinary Corps and retired with the rank of Colonel. Her last two Army assignments were Chief, Department of Veterinary Sciences, Army Medical Center and School, where she was responsible for basic and advanced training of enlisted soldiers and officers in the U.S. Army Veterinary Services, and Director of the Department of Defense Veterinary Laboratories. As Director she had oversight of food microbiology, food chemistry, and animal diagnostic testing for laboratories in the U.S., Panama, and Germany.

In 1999, Dr. Brown joined the Florida Department of Agriculture and Consumer Services as Chief, Bureau of Food and Chemical Residue Laboratories. During her tenure she initiated the process to attain the American Association of Laboratory Accreditation and renovation of the food laboratory into a bio-safety level 3 laboratory. She was appointed in 2002 as Director of the newly-created Office of Bio and Food Security Preparedness (now Office of Agriculture Emergency Preparedness), which had oversight for emergency preparedness and was the liaison with the State Domestic Security Task Force.

Dr. Brown became the Deputy Commissioner for Food Safety in 2004 with oversight for the Divisions of Food Safety, Dairy Industry, and Agricultural Environmental Services and served until her retirement in January 2011. As the agriculture representative on the executive board of the State Working Group for Domestic Security, she helped obtain federal domestic security funding for the department. Dr. Brown was Chair, Florida Food Safety and Food Defense Advisory Council from 2004 to 2005 and remained the agriculture representative until her retirement.

She has been an honorary member of AFDO and Chair of the Awards Committee from 2007 to present. Dr. Brown is the past president and a lifetime member of the Association of Food and Drug Officials of the Southern States (AFDOSS). In 2012 she was awarded the Eugene H. Holeman Award for outstanding service to AFDOSS. [Mentor to Nicole Berzins and Thao Nguyen.](#)



**Charlene Bruce** retired in 2011 after serving for thirty years with the Mississippi State Department of Health. For the last twenty years of her tenure she served as the Director of the Food Protection Program for the statewide Food Retail and Food Processing Programs. Prior to becoming the Director of the Food Protection Program, she served as an FDA Rating Officer for both the Milk and Food Programs.

Under her leadership, the Food Protection Program became one of the first in the nation to develop and implement a risk-based inspection program. Additionally, under her direction, this program initiated a manager certification requirement in all food facilities, enrolled in and began implementation of the FDA Voluntary National Retail Food Regulatory Program Standards, and incorporated HACCP principles into the routine inspectional program.

While serving as Director, the Food Protection Program of the Mississippi State Department of Health became one of the first programs nationwide to adopt the original FDA Food Code in 1993 and to lead the country as the first state program to adopt the 2009 Food Code. The Mississippi State Department of Health awarded her the Public Health Environmentalist of the Year award.

While a commissioned officer with FDA, Ms. Bruce coordinated numerous joint investigations with the FDA Southeast Region and New Orleans District. As a result, the Food Protection Program was the recipient of the FDA's Commissioner's Special Citation Award and the Hammer Award. Following her directive, the Food Protection Program in Mississippi continues to be actively involved in the implementation of the FDA Manufacturing Food Regulatory Program Standards.

Ms. Bruce served as President of AFDO and currently serves as President of AFDOSS. She was awarded the Eugene H. Holeman Award for outstanding service to AFDOSS. She has served on numerous AFDO and AFDOSS committees and is presently Chair of the Education and Training Committee.

Following Hurricane Katrina, USDA presented Ms. Bruce with the Gulf Relief/Supporting our Neighboring Communities medal. She has been involved in training and advisory positions with the Conference for Food Protection (CFP), the National Environmental Health Association (NEHA), the National Association of County and City Health Officials (NACCHO), and the Food and Drug Administration (FDA) Training Branch.

Ms. Bruce received her B.S. Degree from The University of Southern Mississippi and her M.S. Degree in Food and Dairy Science from Mississippi State University. [Mentor to Jessica Badour and Lisa Potopsingh.](#)



**J. Joseph Corby** worked for the New York State Department of Agriculture and Markets, Division of Food Safety and Inspection, for 37 years. After receiving his Environmental Health degree in 1970, he became a Food Inspector with the Department in the Syracuse area. Following promotions to Senior Food Inspector in Buffalo,

NY in 1975, Supervising Inspector in Albany, NY in 1984, Director of Field Operations in 1989, and Assistant Director in 1994, he was appointed Director of the Division of Food Safety & Inspection in 1999 until he retired in May of 2008.

His service with the Department included the design of numerous food safety training programs for regulators and industry, the design of the Division's risk-based inspection system, and the authorship of New York's Cured, Salted & Smoked Fish regulations. He also collaborated with FDA's New York District Upstate Import Operations in designing the Imported Food Initiative Project where state inspectors were commissioned to conduct imported food inspections and surveillance – a first of its kind in the U.S.

Mr. Corby has been a member of the Central Atlantic States Association of Food and Drug Officials (CASA) since 1975 and has served as the Niagara Frontier Conference President, North East New York Conference Executive Board Representative, and CASA President. He was awarded the coveted CASA Award in 1991, CASA Service Recognition Award in 1992, and CASA Lifetime Achievement Award in 2008. The New York State Association of Food Protection awarded him the prestigious William V. Hickey Award in 1995 for outstanding service in the field of food sanitation and the Emmitt Gauh Award, which is the Association's highest award. He is also a member of the Northeast Food & Drug Officials (NEFDOA) and received their prestigious Eaton E. Smith Award in 2014.

A member of AFDO since 1985, he has served as Chair for the AFDO Food Committee, where he spearheaded the development of several model codes, food processing guidelines for industry and government regulators, training programs, and numerous official AFDO comments relating to national food safety issues. He was awarded AFDO's Distinguished Service Award in 1995 and 2000 and became President of AFDO in June of 1998. He has also received the prestigious Harvey W. Wiley Award on June 19, 2001 and AFDO's Lifetime Achievement Award on June 16, 2008.

Currently, Mr. Corby serves as the Executive Director for AFDO and continues to work as an Instructor for the University of Tennessee and Louisiana State University. He is also a member of the University of Florida Food Science & Human Nutrition Advisory Council and the Board of Directors for both the International Food Protection Training Institute and the Partnership for Food Safety Education. Mentor to Matt Colson.



**Dr. Paul Dezendorf** teaches in the Master of Health Sciences program at Western Carolina University in the University of North Carolina system. At the University of South Carolina, he earned a Ph.D. in Public Health, a Graduate Certificate in Gerontology, and a Master of Social Work in Community Development, as well as a Master of Business Administration from Rutgers University. He also received a doctoral fellowship at the Centers for Disease Control and a Fulbright Scholar award for teaching and research in Russia. He has taught in several universities, including UNC-Greensboro, East Carolina University, and Winthrop University in South Carolina. Prior to his academic career, he held management and regulatory positions in the cable television industry. Research Project SME.



**Jim Sevchik** retired from the New York State Department of Agriculture and Markets after 33 years of public service. He served for 18 years as Chief Inspector for the Division of Food Safety and Inspection, where his duties included the supervision of field inspection activities for the Upstate District with field offices in Buffalo, Rochester, and Syracuse, New York.

As a Commissioned Officer with FDA, Mr. Sevchik coordinated numerous joint investigations with this agency. He is the recipient of three Commissioner's Special Citation Awards from FDA and the Hammer Award from former Vice President Al Gore as part of the National Partnership for Reinventing Government for his assistance to FDA and development of a training program for FDA regulated imports. Mr. Sevchik also received an award from FDA's Office of Criminal Investigations for his work assisting this office during criminal investigations involving product tampering and product diversion.

Mr. Sevchik frequently presented courses for FDA's Office of Human Resource Development on food labeling, vacuum packaging and food protection.

Jim Sevchik served as President of the Association of Food and Drug Officials and the Central Atlantic Affiliate of this association. He was awarded the prestigious Harvey W. Wiley Award from AFDO and the CASA Award from the affiliate. He also chaired the Food Committee for the New York State Association of Food Protection and was presented with the William V. Hickey Award for his work on food safety issues.

After retiring from New York, Mr. Sevchik served as Training Director for AFDO where he designed and managed national training programs that addressed food safety, dietary supplements, imports, drugs, medical devices and body art safety.

In addition to his work in the Fellowship Program, Jim Sevchik is an Adjunct Instructor for the University of Tennessee Center for Agriculture and Security and Preparedness and the Louisiana State University National Center for Biomedical Research and Training. Mentor to Tessa Dixon.



**Cameron Smoak** joined the Georgia Department of Agriculture in 1976. Mr. Smoak served in various positions within the agency over a period of 30 plus years. He served as the Assistant Commissioner of the Georgia Department of Agriculture's Consumer Protection Division from 1995 until his retirement on January 31, 2007. In that capacity, he managed the field inspection forces responsible for the enforcement of

rules and regulations relating to food processing—retail food sales—and fuel and measures designed to protect Georgia consumers. He supervised a staff of over 230 inspectors, specialists, and support personnel. Additionally, he served as a member of the Agriculture Department's legislative liaison team for over 28 years.

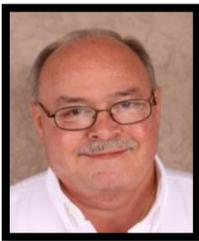
Mr. Smoak served for many years as the Department of Agriculture's liaison to the Georgia Emergency Management Agency and has extensive experience in crisis

management. His emergency work included coordinating relief efforts relating to livestock welfare and food and water wholesomeness and sanitation when Georgia was impacted by tornadoes, hurricanes, and other disasters, including the 1994 flood – one of the state’s most extensive and costliest disasters. He worked with local and federal counterparts in coordinating food safety efforts for two international events hosted in Georgia – the 1996 Olympics and the G8 Summit held in 2004.

Mr. Smoak has served as a member of the Georgia Homeland Security’s Agriculture and Food Defense subcommittee. He is past president of AFDO and AFDOSS. He was AFDO’s first representative to the Food and Agriculture Sector Government Coordinating Council (GCC) led by the U.S. Department of Homeland Security, United States Department of Agriculture and the FDA. In addition, he has been a member of AFDO’s Seafood HACCP Training Program Certification Committee and chairman of AFDO’s Rules and Regulations Committee.

Mr. Smoak currently works as a consultant in the areas of food safety, food defense, and crisis management. His consultancy projects include work with WinWam Software Inc., Uriah Group, USAID, the Georgia Department of Agriculture, CRA, Inc., the University of California Davis Western Institution for Food Safety and Security, the University of Tennessee Center for Agriculture and Security and Preparedness, and the Louisiana State University National Center for Biomedical Research and Training.

The USAID project involved foreign travel to Egypt as part of a project to establish a new single Food Safety Agency. The purpose of the new food safety agency is to help improve Egypt’s domestic food safety and to enhance their international reputation for the safety of food products processed and exported by Egyptian businesses. He served as the expatriate consultant on the Inspection Work Group responsible for setting up the new field inspectional sector of the Food Safety Agency. Mentor to Eugene Evans.



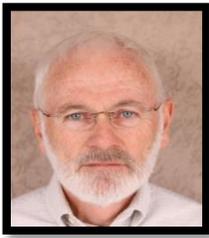
**Dan Sowards** retired in 2010 as the Food and Drug Safety Officer for Texas, and was employed for 37 years in food and drug safety by the Texas Department of State Health Services. He served in many different capacities during those years, including Director of the Manufactured Foods Division (MFD) and Acting Director for the Drugs and Medical Devices Division between 1995 and 2010. Dan was responsible for the inspection and regulation of more than 20,000 manufacturers and wholesale distributors throughout Texas. Under his

direction, in 1995 the MFD developed the first complete risk assessment module for food manufacturers in the U.S., which was requested and used by the FDA as a basis for future risk assessments for FDA’s inventory of manufacturers. In 2002, Mr. Sowards took a brief leave of absence from his director position to develop an in-house decision tree and training for dealing with intentional contamination of the food supply and was a member of a national industry/government group dealing with the same issue.

Dan is a past president of the Association of Food and Drug Officials (AFDO) and a recipient of the Harvey W. Wiley Award, the highest honor bestowed by that organization. He is currently an active member of two AFDO working committees, and is the past training director for AFDO and currently the training liaison for the development of AFDO training workshops sponsored by IFPTI. He is also a past *Association of Food and Drug Officials*

president (twice) of the Mid-Continental Association of Food and Drug Officials regional affiliate of AFDO.

During his many years of service, Mr. Sowards has addressed numerous national settings and written for such publications as the Journal of the New York Bar Association, the Food and Drug Law Institute's FDLI Update, and the Journal for Food Protection. Dan has participated as a presenter at numerous forums for the FDLI, Food Update, and for the FDA, and in the early nineties worked directly with FDA in the development of the food labeling regulations following the passage of the Nutrition Labeling and Education Act. He also worked directly with the Federal Trade Commission's Consumer Protection Division on a number of food labeling and misbranding issues. Dan was a Work Group Chair for the original Food Safety System initiative under President Clinton, and has provided numerous comments over the years, both for Texas and for AFDO, to the FDA on various food safety-related issues, including the original FDA Food Code. Dan was also the only State regulatory representative on the FDA's original Food Advisory Committee established in 1991, which developed FDA's policy on reviewing genetically modified foods and the approval of the use of Recombinant Bovine SomatoTropin Hormone (RBST) for use in dairy cattle. Mentor to Randy Treadwell.



**Steve Steinhoff** worked as a food safety professional at the Wisconsin Department of Agriculture, Trade and Consumer Protection for 36 years. For more than 18 of those years, Mr. Steinhoff was the administrator of the Department's Division of Food Safety. As Administrator of a division comprised of approximately 200 food protection professionals and support staff, he led statewide programs in the areas of manufactured food, retail food, meat inspection, dairy manufacturing, and dairy production. In this leadership role, he also was

responsible for management of the division's budget and personnel functions, as well as liaison and collaboration with other divisions, the Office of the Secretary, other state and federal agencies, and the state legislature.

Mr. Steinhoff was an active member of the federal-state team that authored the FDA's Manufactured Food Regulatory Program Standards. He also was a member of an FDA cadre that delivered training to both federal and state food safety regulatory personnel on auditing state manufactured food regulatory programs.

Currently, Mr. Steinhoff is employed on a contract basis as a course developer and instructor by the International Food Protection Training Institute (IFPTI) and the National Center for Biomedical Research and Training (NCBRT) at Louisiana State University (LSU).

Professionally, Mr. Steinhoff is a Past-President of AFDO, and its regional affiliate, the North Central Association of Food and Drug Officials (NCAFD). Mentor to Bryan Buchwald.

## About the Fellows

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**Jessica Badour** is the Recall Outreach Specialist for the **Georgia Department of Agriculture (GDA)** Food Safety Division. She joined the GDA in 2010 as a Public Information Officer/communications specialist in the Public Affairs Office and made the switch over to food safety in 2012. Her current role is funded through a three-year FDA cooperative agreement that concludes in June 2015, aimed at enhancing

the GDA's communications assets in terms of notifying related demographics (i.e., the state's school lunch program) about food and feed recalls, in addition to any emerging food safety issues or foodborne illness outbreaks impacting the state. Through the cooperative agreement, the GDA intends to develop new communication avenues using different forms of media as a means to educate Georgia's population on recall classifications and their implications. Jessica has spent the last decade working in media and public relations and has a Bachelor's Degree in English from Hood College, (Maryland). She is an active member of various organizations, including AFDOSS, the Georgia Association for Food Protection, Georgia Food Safety & Defense Task Force and the Georgia Environmental Health Association. She tweets on behalf of the GDA on Twitter @GDAFoodSafety. Originally from Long Island, NY, she has lived in Georgia since 2007 and currently resides in Lithia Springs. **Mentor: Charlene Bruce**



**Nicole Berzins** began her work with food safety with great success as a Food Emergency Response Network research microbiologist in 2008. She joined the **Colorado Department of Public Health and Environment** in 2012 and began educating and informing industry partners on regulatory requirements. She looks forward to creating a stronger connection with industry partners by providing outlets for better

communication ensuring food safety for the community. **Mentor: Joanne Brown**



**Bryan Buchwald** is the Section Director for the Poultry, Egg and Organic Section of the **Oklahoma Department of Agriculture Food and Forestry (ODAFF)** and has been employed by ODAFF for nearly 15 years. Bryan is responsible for the performance management and daily supervision of divisional employees, coordination of overall program activities, and budgeting and revenue management. He and

his team are responsible for the implementation of the Oklahoma Egg Law and Oklahoma Organic Law, as well as the cooperative agreements with the United States Department of Agriculture Agricultural Marketing Service (USDA-AMS). Additionally, he is an auditor for the USDA-AMS Child Nutrition labeling program. He serves as an expert representative for the poultry, egg, and organic section with the federal government, industry, and general public throughout the state. He currently serves as the Mid-Continental Association of Food and Drug Officials (MCAFD) president and is the vice-president of the National Egg Regulatory Officials (NERO). **Mentor: Steve Steinhoff**



**Matt Colson** completed his Bachelor of Science degree in Biology from Florida State University in 2008 while working full time as an Assistant Grocery Manager for a national retail grocery chain. After receiving his degree in 2008, Matt began working as a Plan Reviewer for the Florida Department of Business and Professional Regulation, where he reviewed construction plans for food service establishments throughout the state to ensure compliance with applicable food safety regulations. In 2009, Matt began working for the **Florida Department of Agriculture and Consumer Services (FDACS)** as the FDA Food Contract Administrator, where he oversaw all aspects of the food contract, under which the Division of Food Safety conducts 490 food inspections and collects 200 environmental samples per year. Matt earned a Master of Public Health degree from Florida International University in 2011 while working for FDACS. In 2012, Matt was promoted to the HACCP Team Administrator where he was responsible for overseeing the training of field staff in conducting specialized inspections in retail and manufactured food establishments. In this position, Matt became heavily involved with the implementation of the Manufactured Food Regulatory Program Standards (MFRPS). Matt is currently the Environmental Administrator of the Training and Quality Assurance program for a staff of over 145 food inspectors and supervisors, who inspect more than 45,000 retail and manufactured food establishments. Matt is the Principal Investigator for the MFRPS Cooperative Agreement with FDA, and is responsible for the implementation of both the Retail and Manufactured Food Regulatory Program Standards. Matt is a member of AFDO, AFDOSS, the Manufactured Food Regulatory Program Alliance, and the Conference for Food Protection. **Mentor: Joe Corby**



**Tessa Dixon** is a Program Administrator with the **Louisiana Department of Health and Hospitals**. Tessa received her Bachelor of Science Degree in Microbiology with a minor in Chemistry and has a Master's Degree in Business Administration. She administers the Food & Drug and Milk & Dairy Programs for Sanitarian Services under the Office of Public Health as a Registered Sanitarian. She has over twelve years of experience in public health inspection including five years in retail food inspections, six years in manufacturing food inspections and nearly two years of experience at the program management and administrator levels. She is a commissioned FDA credentialed inspector and also manages the FDA Food Safety Inspection Contract and the FDA-MFRPS cooperative agreement. In 2013 she was appointed to the Louisiana State Sanitarian Board of Examiners. Tessa has participated in several of the FDA advanced level courses and throughout all of these experiences has developed great relationships with many state and federal regulatory officials. She looks forward to continued growth and development as an administrator and the opportunity to advance and support an integrated food safety system. **Mentor: Jim Sevchik**



**Eugene Evans** was born and raised in New York City. He graduated from Cook College at Rutgers University in 2000 with a Bachelor of Science in Natural Resources Management (specializing in Marine Fisheries). He was hired by the **New York State Department of Agriculture and Markets** (NYSDAM) in 2001 as a Food Inspector 1. Commissioned by FDA, he has spent 13 years conducting various inspections including retail, seafood HACCP, acidified, LACF, Juice HACCP, manufactured foods, custom slaughter, and live poultry. He was also part of the PDP/MDP Sampling Program for the NYSDAM. With his expertise he became an AFDO/SHA Seafood HACCP Trainer and created the AFDO Fish Evisceration Video. He is a member of CASA and AFDO. During Eugene's career he has been certified by the American Fisheries Society as a Certified Fisheries Professional and has acquired his 50 Ton Master Captain's License with the USCG. **Mentor: Cameron Smoak**



**Thao Nguyen** is currently a Food Safety Specialist at the **Iowa Department of Inspections & Appeals** in Des Moines, Iowa. Prior to her current position, she received her Bachelor of Science in Biology from Iowa State University and earned a position at Johnson County Public Health Department in Iowa City, Iowa as an Environmental Health Specialist. After attending training with the Iowa Department of Inspections & Appeals, Miss. Nguyen was drawn to working directly with the State of Iowa in Food Safety Protection. In addition to inspections, Ms. Nguyen enjoys spending time with her family, reading, and running. She recently signed up for her first marathon. **Mentor: Joanne Brown**



**Lisa Potopsingh** received her Bachelor of Science in Biology from the State University of New York at Stony Brook and began her career with **Suffolk County Department of Health Services** in 2006. Lisa began her career by conducting regulatory inspections of food service establishments, food vending vehicles, child care facilities, and special events with food service. She was also responsible for investigating foodborne illness outbreaks and general complaints. Lisa currently maintains a New York State Food Safety Inspection Officer-Level I certification and is an active member of the New York Chapter of the Central Atlantic States Association of Food and Drug Officials (CASA). In 2013, Lisa was promoted to a senior level position where she currently supervises day-to-day activities within the Food Protection, Temporary Residences and General Sanitation units. **Mentor: Charlene Bruce**



**Randy Treadwell** graduated from the University of Washington with a Master of Public Health degree in Environmental and Occupational Health Sciences. He joined the **Washington State Department of Agriculture (WSDA)** in 2009 as a Food Safety Officer, a position that provided him the opportunity to conduct regulatory inspections at manufactured food processors, dairy plants, dairy farms, and custom meat processors. Randy has been actively involved in the Washington State Rapid Response Team (RRT) since its inception and has held several positions on the team including “boots-on-the-ground” responder and Rapid Response Coordinator. Randy currently serves as the Rapid Response Program Manager and assists in the coordination of food/feed emergency response activities for the WSDA Food Safety and Consumer Services Division. **Mentor: Dan Sowards**

# State Food Safety Agencies' Use of Social Media

Jessica Holthaus Badour  
Recall Outreach Specialist

Georgia Department of Agriculture Food Safety Division

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## Abstract

This exploratory study examined the effectiveness of state food safety agencies' use of social media to communicate with stakeholders during recalls. The study analyzed responses representing 27 states using a mixed-method approach, incorporating 28 quantitative web-based survey responses and eight qualitative interviews of recall coordinators (or an equivalent position). The author sought to gain further understanding of the following: 1. The most commonly used social media tools by state food safety agencies, 2. length of use of these tools, 3. factors for recall communication, and 4. whether respondents believe social media is an effective communication tool. The study found 23 respondent agencies to be using social media, and 11 respondents specifically indicated social media use during recalls. However, four of the respondents were unaware of the agency's social media use, and some of the food safety staff members were not regularly involved in developing recall messaging. While communication via social media was not necessarily consistent or evaluated for effective outreach from one recall event to another, social media communication provided an immediate outlet for information, and respondents believed social media could be an effective tool for communicating recalls. Study limitations included not incorporating federal or local agencies and only completing a basic content analysis of the study responses with limited interviews.

*Key terms:* social media, recall notification, recall fatigue, Integrated Food Safety System (IFSS), Manufactured Food Regulatory Program Standards (MFRPS), Voluntary National Retail Food Program Standards (VNRFPS), Animal Feed Regulatory Program Standards (AFRPS)

## Background

National food and feed regulatory program standards require states to develop recall programs, including the ability to communicate and educate stakeholders about food and feed safety and defense issues. As states strive to meet full conformance with these standards and work toward a nationally integrated food safety system (IFSS), improved routes of communication are a strong avenue for state food safety agencies to create a faster, more effective dialogue with stakeholders regarding foodborne illness outbreaks and recall events (Elliott, 2011).

However, there are challenges to ensuring recall information has reached the entire distribution chain down to the consumer level. During foodborne illness outbreaks, even with highly-publicized recalls, consumers have continued eating recalled products, causing additional illnesses (Layton, 2010). Recall notices have become so frequent that regulators, food processors, and consumer experts are concerned that the public is suffering from "recall fatigue" (Layton, 2010).

Consumers may additionally suffer “optimistic bias,” where they assume that they are less susceptible to a recall and that the message is aimed at more vulnerable individuals (Hallman, 2013). In a recent Rutgers University study, approximately 40 percent of Americans have ever checked their homes for recalled food and 12 percent admitted they knew they had a recalled food in their home and ate the product anyway (Hallman, 2013). These behaviors could be attributed to the fact that regulatory agencies are not effectively communicating food safety information to all affected stakeholders (Elliott, 2011). Another factor may be that sources for information are continually shifting, which is causing communicators to rethink how to share information and news (Seitz, 2014).

An increasing number of stakeholders use social media as a primary news source and are looking to the Internet for food safety information (Holcomb, Mitchell & Page, 2013). Nearly 40 percent of the American population gets news updates from Facebook and Twitter (Holcomb, et al., 2013), and in the past two years, the number of people using social media daily to receive news updates has increased 10 percent (Downing, 2015). These statistics highlight the fact that consumers are already looking to these platforms for information updates. Meanwhile, the sharing capabilities of social media mean “friends and family” can rapidly spread the recall information, making the message personal to their network of contacts and helping combat aspects of recall fatigue and optimistic bias.

With consumers and stakeholders already using social media for news and information updates, regulatory agencies can benefit from refining how they communicate with stakeholders (Brown, 2015). For government in particular, social media provides a voice, humanizing the agency while fostering relationships during information-sharing (Grantham, 2015). When compared to traditional media channels, social media may allow regulatory agencies to quickly and directly reach a large network of stakeholders with the intended message. Timely disclosure is an effective way to contain the damage by discouraging consumers from using potentially hazardous products sooner, reducing incidents of illness (Whitworth, 2015).

### **Problem Statement**

There is no published research in peer-reviewed food safety literature regarding social media practices by state food safety agencies related to effective communication of food recalls with the public.

### **Research Question**

1. Which social media tools are most commonly being used by state food agencies to communicate recalls, and how long have these tools been used?
2. Which factors are considered for communication, and who communicates the message for the agency?
3. How effective is social media as a recall communication tool, and how does the agency measure success?
4. Does the agency have policies in place regarding the use of social media or provide any related training opportunities for staff?

## Methodology

This project used a mixed-method approach in the form of a quantitative analysis of state food agency respondents' survey data and qualitative interviews with the agencies' recall coordinators and/or public information officers who are communicating with stakeholders on behalf of the agency.

The survey was administered through SurveyMonkey, a web-based survey software program. The survey was submitted to 68 program managers at both agriculture and health state food safety agencies. The Association of Food and Drug Officials (AFDO) Directory of State and Local Officials was used to identify contacts. Respondents came from 28 agencies in 27 states (41 percent response rate), including 15 agriculture and 13 health departments (or equivalents).

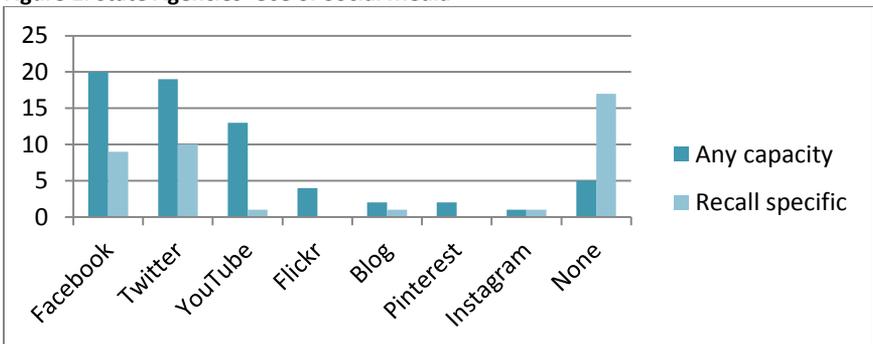
Quantitative data was gathered through an 11-question survey for baseline information about agencies' use of social media to communicate with stakeholders, both generally and specifically for food recalls. Qualitative data was gathered through open-ended questions on the survey, as well as during real-time phone and in-person interviews with eight survey respondents. Interview responses were evaluated to analyze how social media was used as a communication tool for recalls and agencies' organizational culture surrounding its use.

## Results

Results of the study came from respondents in 27 states, including five of the 10 most populated states in the country (U.S. Census Bureau, 2010). Based on the data and the opinion of the author, the sample can be generalized with respondents representing states with some of the largest metropolitan areas in the U.S., including California, New York, Florida, Georgia, and North Carolina.

The study found 23 out of 28 state agencies (82 percent) have active social media accounts; however, only 19 respondents were aware of the social media accounts. The author performed independent research, which confirmed four additional agencies with accounts on one or more social media platforms. Looking specifically at recall communications, 11 of the 23 respondents (48 percent) said they use social media to communicate recalls. Nearly all respondents indicated social media use began in 2010 or later.

**Figure 1. State Agencies' Use of Social Media**



Of the 11 respondents who said their agency is using social media to communicate recalls with stakeholders, whether they communicated was dependent upon various factors. These factors included recalled product origination and distribution (64 percent communicate in-state origination and/or distribution and 11 percent only communicate recalls that originated in-state), scope of incident (distribution size, pathogen of concern, number of illnesses, etc.), and public interest or media attention.

Sixteen respondents (57 percent) said that the agency communicates via social media solely through communications or marketing staff. Three respondents (11 percent) said recall coordinators are involved; and four respondents (14 percent) said communication is done through a combination of staff, including both food safety and communications staff. The other five respondents (18 percent) answered “N/A,” due to no social media use.

None of the respondents indicated measuring the success of social media as an effective tool for recall messaging. Of the agencies using social media for recalls, 30 percent were not measuring success in any capacity; the other 70 percent evaluated success using basic analytics such as Facebook “likes,” Twitter “follows,” clicks on a link, “hits” on a website, etc. Social media effectiveness was only evaluated as a whole to stakeholders and not specifically related to recalls, with little to no analysis on the impact.

Survey respondents were asked to rank social media as a communication tool on a scale of zero to five (zero meaning social media is “not effective at all” and five meaning it is “highly effective”). The average score was three.

One respondent in the study indicated that the agency has a finalized written recall policy or procedure that covers social media use; the other respondents did not, even if their agency is communicating recalls in this fashion. Two respondents confirmed that external social media training opportunities are available, but said this type of training is not required and generally only offered to communications staff.

For agencies not using social media in any capacity, the reasons included the use of other methods (such as traditional press releases and/or emails), leaving the responsibility up to the recalling firm or media, agency staff restricted from social media use at work, limited control over content and messaging, a desire to only promote positive comments, recall fatigue, or social media never being discussed as an option.

## **Conclusions**

Based on the research, this project found that 23 state food safety agencies have established social media accounts to create a dialogue with stakeholders; however, four respondents were unaware of these communication outlets and only seven respondents were included in the agency’s development of social media communications, including recall communications. These findings, coupled with the absence of written procedures (one respondent) and training opportunities (two respondents), indicate a lack of intra-agency communication coordination and organizational culture surrounding social media use as an interactive communication tool.

Survey respondents’ feedback indicated social media can be an effective tool for communicating recalls. The study evaluated perceived effectiveness of social media as a recall communication tool, as gauged by the respondents. The average scaled ranking of

three indicated that the majority of survey respondents feel social media is at least somewhat effective. During interviews, respondents said they believed that a lack of social media use related to recalls could be detrimental to the agency's public health mission.

Based on the results of this study, the author was unable to assess whether social media is an effective communication tool because the majority of respondents had not conducted baseline assessments or evaluated the effectiveness of social media messaging for recalls. While survey respondents believe social media is an important and effective tool for recalls, they are unsure about how to evaluate effectiveness. With social media having been used for an average of four years or less, there is an opportunity for future research.

Survey and interview responses aligned with research findings that interacting with stakeholders through social media can instill confidence in the agency and address public concerns. Social media platforms provide an immediate outlet for communication in a format that consumers are already looking to for updates and new information. This communication is critical during recall events, and highlights state food safety agencies as credible, reputable sources for this type of information. Additional research regarding the pros and cons of social media implementation for regulatory food safety agencies on the federal, state, and local level is an important concept to analyze outside this research study.

### **Recommendations**

Based on the results and conclusions of this research project, the following recommendations are issued for consideration:

1. State food safety agencies that are already using social media in some capacity should evaluate their ability to incorporate recalls into social media messaging.
2. A model policy, procedure, or guidance document could be created regarding social media implementation for regulatory agencies, which would support the alignment of policies and procedures to address the use of social media communications during recalls and other food events. (Various national standards, including the Manufactured, Retail, and Feed Program Standards, could provide an effective guidance framework for states to incorporate.)
3. State agencies' food safety and communications staff should be jointly trained to share the responsibility of using new or existing social media platforms as a risk communication tool during recalls and other food events, which may support a stronger agency-wide message, create an interactive approach, and provide increased situational awareness for the communications staff as a recall or other food event progresses.
4. Social media training should incorporate best practices for evaluating the success of this type of food safety messaging. Baseline statistical information and analytics could further support successful social media use for recall dissemination. Such data could benefit all stakeholders and allow agencies to ensure relevant platforms are used and can be improved and revised as needed.

## Acknowledgments

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# Preparing for the Implementation of a Routine Inspection Program in Colorado

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## Abstract

Recently, Colorado took steps to develop a routine inspection program of wholesale manufacturing firms. This proactive approach by the state is consistent with the overall preventive approach of the Food Safety Modernization Act (FSMA); however, in order for the new routine inspection program to be most effective, input from the firms being inspected is needed. This study analyzed the responses to questions posed during two focus group sessions representing a range of wholesale manufacturing operations: 1) larger firms with significant business experience and with access to local or county health departments, and 2) smaller operations with less business experience and with limited or no access to local or county health departments. Focus group participants were asked a series of questions related to regulatory guidance and information, and a content analysis of the focus group discussions was conducted. A majority of participants from both focus groups felt it was difficult to understand regulatory language, and was confused by local and state requirements. Various sources of guidance and information were mentioned, but most participants indicated these sources were not helpful. Based on the focus group discussions, there is a need for more effective outreach efforts on the part of local and state regulatory bodies. Enhancing these outreach efforts will better prepare wholesale manufacturing operations in Colorado for the state's new routine inspection program, and will help these firms become FSMA-compliant.

*Key terms:* Colorado Department of Public Health and Environment, information, industry partnership, integrated food safety system (IFSS), routine inspection program, support, wholesale manufacturing operations

## Background

Illness and hospitalizations related to foodborne illness continues to be a concern in Colorado, especially since the multistate outbreak of listeriosis caused by cantaloupes from the state. The outbreak caused 147 illnesses, including 40 in Colorado (CDC 2012). Colorado currently inspects just 25% of the registered food manufacturing firms in the state, either through Food and Drug Administration (FDA) contract inspections, food defense inspections, or inspections resulting from complaints, recalls, certificate of free-sale requests, and firms found to be in noncompliance from previous FDA inspections. However, the Colorado Department of Public Health and Environment (CDPHE) is in the beginning phases of developing a routine inspection program for wholesale manufacturing operations in the state, a plan that mirrors the proactive approach to food safety taken by the Food Safety Modernization Act (FSMA). Successful implementation of the routine inspection program, however, requires study of how wholesale manufacturing operations feel they can best benefit from the state program.

## **Problem Statement**

It is not known what type of support wholesale manufacturing firms in Colorado would like a routine state inspection program to provide them.

## **Research Question**

1. How do wholesale manufacturing operators in Colorado obtain information related to food safety requirements?
2. What types of support do wholesale manufacturing operators in Colorado want from state regulatory bodies?

## **Methodology**

Individuals representing wholesale manufacturing operators were invited to participate in two focus groups where the individuals could share perspectives and opinions related to the types of regulatory support that would benefit their operations. Two focus groups were conducted involving a total of twenty-two (22) participants. Focus Group 1 represented 12 larger wholesale manufacturing firms with direct access to local or county health offices. Focus Group 2 represented 10 smaller wholesale manufacturing firms located in parts of the state where access to county health offices was limited or unavailable. Participants in Group 2 generally represented firms in more rural and remote locations in the state. The firms represented by the focus groups had business experience ranging from more than twenty years to less than one year.

Each focus group consisted of 45 to 60 minutes of questions and answers, along with conversation, all of which was recorded. A qualitative analysis of the focus group transcripts was conducted to determine the frequency by which certain concepts and ideas were raised.

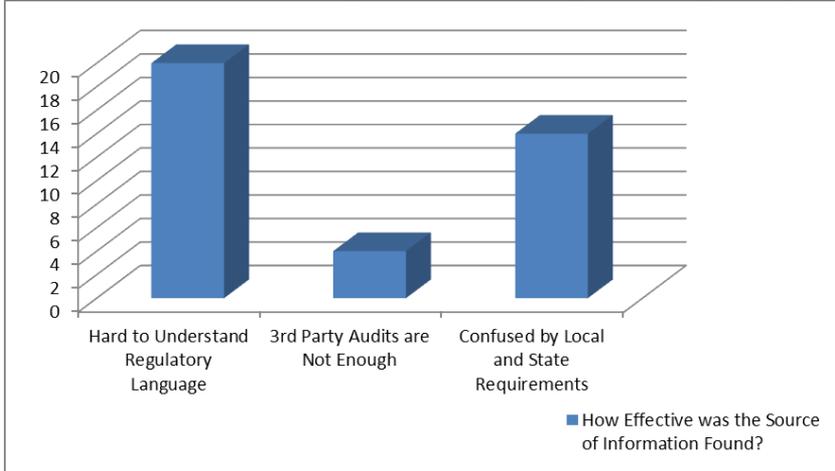
Specific questions for the focus groups included, but were not limited to the following:

1. How do operators know about regulatory requirements in Colorado?
2. How do operators prepare for state inspections?
3. How do operators find information pertaining to regulatory requirements?
4. What was most helpful or not helpful about the information found?
5. What support do industry partners most want and need in order to best comply with regulatory requirements?

## **Results**

A majority of focus group participants - regardless of having access to local or country health departments - indicated confusion concerning local and state regulatory requirements, and difficulty with understanding regulatory language. Additionally, a handful of participants indicated that having access to third-party auditors - consultants from non-regulatory agencies - was insufficient in helping the participants understand food safety regulatory requirements (see Figure 1).

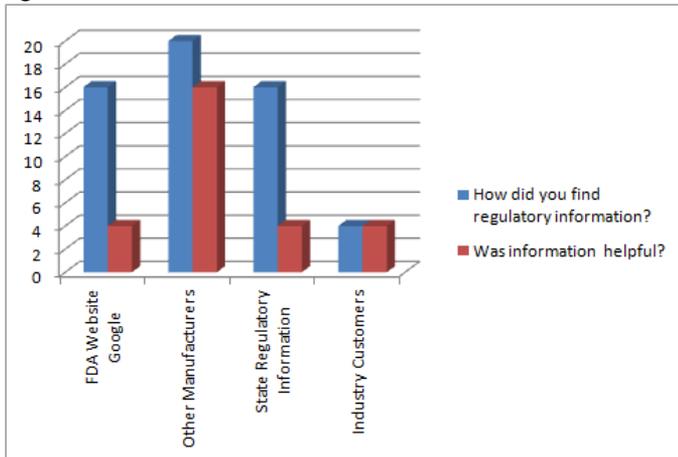
**Figure 1. Effectiveness of Food Safety Information Found by Focus Group Participants**



Over 85% of the twenty-two participants indicated a desire for a supportive approach to regulating wholesale manufacturing operators, i.e., having CDPHE provide operators with guidance, information, and other regulatory support to assist with regulatory compliance. However, focus group participants representing firms with less than five years of experience indicated they had no idea that CDPHE offices could provide support on various aspects of their business, or that firms could reach out to CDPHE for assistance with, for example, label reviews.

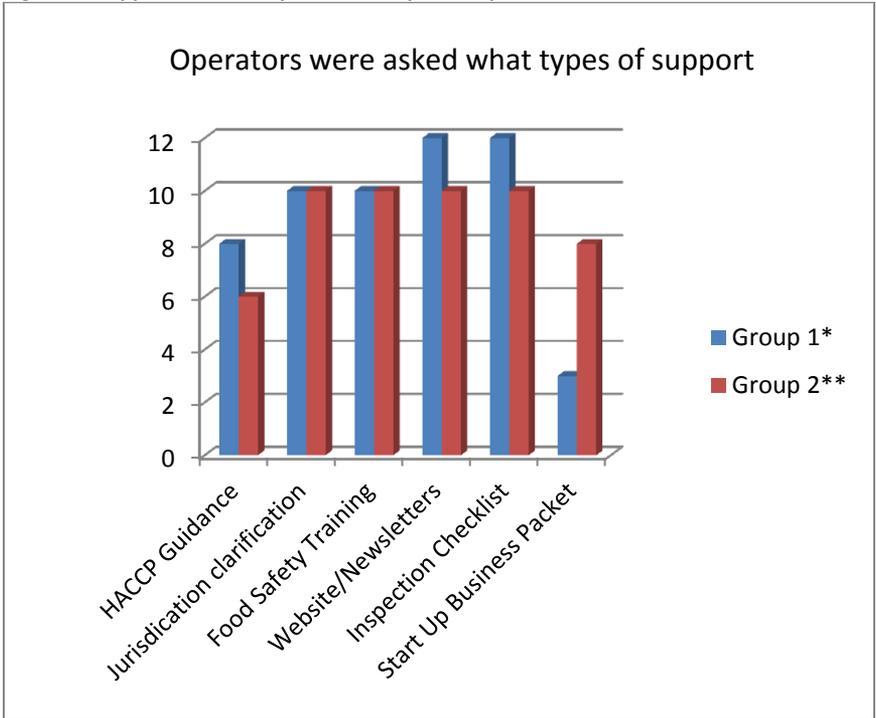
When asked how regulatory information is obtained, the most common responses from the focus group participants included “other manufacturers” and “industry customers,” suggesting that wholesale manufacturing firms in Colorado are looking to non-regulatory bodies for assistance and guidance. Additionally, participants who indicated receiving information from regulatory bodies such as FDA and CDPHE felt that the information was not very helpful.

**Figure 2. Information Sources**



When asked what types of support operators need in order to best comply with food safety regulatory requirements, similar topics emerged from both focus groups. Having an “inspection checklist” regarding the inspection process, along with having access to user-friendly websites, newsletters, or brochures, was determined to be most supportive, especially among the firms that did not have dedicated quality assurance staff. Other means of support included training sessions on food safety, guidance on federal, state, and local food safety regulations (to clarify jurisdictional issues), and training or guidance on Hazard Analysis and Critical Control Points (HACCP). Participants representing firms with lesser business experience, however, specifically mentioned a need for a “start-up business packet” (see Figure 3).

**Figure 3. Support Needed by Focus Group Participants**



**Conclusions**

This research addresses the perspective of wholesale manufacturing operators in Colorado regarding regulatory information and guidance, along with an insight as to the types of information and guidance needed to help firms better prepare for the routine inspection program that will soon be implemented in the state. Although the research findings are limited to comments from twenty-two individuals representing a variety of wholesale manufacturing firms in the state, the researcher has drawn the following conclusions.

Food safety regulatory information is difficult to understand and often confusing, and having access to a third-party auditor may not be sufficient to help firms understand food safety regulations and requirements.

Wholesale manufacturing operations in Colorado, especially smaller operations with less experience, may be unaware that CDPHE can provide regulatory assistance and guidance.

Wholesale manufacturing operations in Colorado may be turning to non-regulatory bodies such as other manufacturers and industry customers for information and assistance related to food safety regulations and requirements. Additionally, information currently being obtained from regulatory bodies (FDA, CDPHE) may not be helpful.

Wholesale manufacturing firms may prefer to receive regulatory guidance and assistance through specific formats such as newsletters, websites, checklists, and informational packets, especially for firms with no dedicated quality assurance staff.

These conclusions suggest that, from an industry perspective, there is a need for an increased role by CDPHE, along with local and county regulatory bodies, as the routine inspection program undergoes implementation across the state.

### **Recommendations**

Based on the conclusions drawn from the research findings, the following recommendations should be considered.

This research should be expanded to capture information from a wider group of participants. This expansion can be done by conducting additional focus groups, or by developing an electronic survey that can be sent out to the manufacturer database(s). The research should also be expanded to include additional sectors in Colorado such as retail food establishments and produce growers.

CDPHE should form partnerships with agencies from other states in the process of implementing a similar routine inspection program. Such interstate partnerships can allow for information-sharing, and can help prevent Colorado from operating within a vacuum.

CDPHE should create a new staff position of public information officer. This individual (or these individuals) would be tasked primarily with building partnerships between CDPHE and local/county health offices, and bringing feedback to CDPHE on regulatory issues from the local or county level. The public information officer(s) should also help inform manufacturing operations of the routine inspection program, especially smaller operations with limited access to local or county offices.

Baseline data should be established regarding the number of reported foodborne illnesses within the state, along with data on the number of violations found during inspections. Establishing the baseline will help CDPHE gauge the effectiveness of the routine inspection program over the coming years.

CDPHE should determine the current level of information accessible to wholesale food manufacturers and, based on those findings, create updated guidance documents, training, and additional outreach material to assist firms in becoming "inspection ready."

Finally, CDPHE should develop stronger partnerships with other state regulatory agencies that have an impact on wholesale food manufacturing operations in the state. Potential state agency partners include the Secretary of State, the Colorado Department of Revenue, and/or the Colorado Department of Agriculture.

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# Awareness of Food Safety Risks in Production of Produce on Oklahoma Farms

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## Abstract

The Oklahoma Department of Agriculture, Food, & Forestry (ODAFF) regulates the use of raw animal manure for certified organic producers, while other producers in Oklahoma are currently not regulated by ODAFF on the use of raw animal manure. This pilot study examined produce grower understanding of raw animal manure risk associated with foodborne illnesses in ready-to-eat produce. The study examined a small, convenience sample of large and small scale produce farms in Oklahoma regarding their use of raw animal manure in the production of ready-to-eat produce. The study included electronic surveys of 17 producers, paper surveys completed by 9 producers, and 15 in-person interviews with producers for a total of 41 produce growers. Interviews were conducted with 3 people with extensive regulatory experience in the produce industry. While the study results cannot be generalized due to the small, non-random sample size limited to one growing season, the results suggest significant risk of microbial contamination by *Salmonella*, *Escherichia coli*, *Campylobacter*, and various other pathogens in the production of ready-to-eat produce in Oklahoma. Recommendations include: (1) develop training and better education of produce farmers regarding raw animal manure use; (2) conduct outreach by delivering education and guidance to producers; and, (3) carry out performance of a larger, more rigorous, state-wide study that measures the producer knowledge and food safety risk associated with the application of raw animal manure in the production of ready-to-eat produce.

*Keywords:* Food Safety Modernization Act (FSMA), produce safety rule, raw animal manure

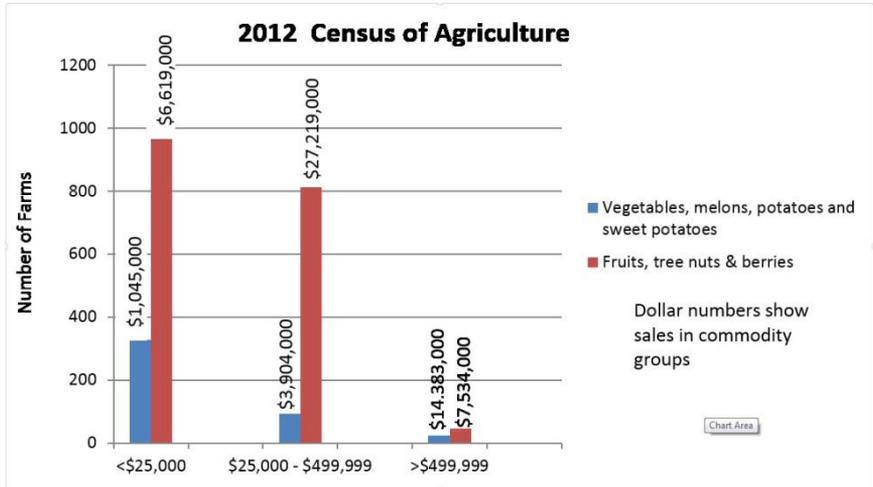
## Background

Raw animal manure is a traditional fertilizer for farms. Raw manure is an excellent source of crop nutrients that maintains or improves soil organic matter content. The practice of using raw manure as fertilizer introduces the risk of contamination of crops and soil by pathogenic organisms, and foodborne illnesses have been linked to produce harvested from land where the producer applied untreated animal manure as a fertilization method prior to the harvest of the crop.

The U.S. Food and Drug Administration (FDA) has proposed a Produce Safety Rule to implement the produce safety requirements contained in the Food Safety Modernization Act (FSMA), protect the public health, and minimize the risk of foodborne illness that would result from microbial-contaminated produce. This proposed rule addresses the use of raw animal manure. The original proposed rule included a nine-month interval between the application of raw animal manure and the harvest of produce. In September 2014, the FDA proposed deferring a decision on the appropriate interval between application and harvest until further research is conducted.

Even after the Produce Safety Rule is implemented, a large portion of the produce farms in Oklahoma will be exempt from coverage, because the farms do not meet business size requirements as illustrated in Table 1. Until further research and risk assessments can be completed and published by the FDA, the produce industry is using guidance found in the 1998 FDA Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables. At this time, this guidance is thought to be minimally used by Oklahoma produce farms, based on the fact that only three farms in Oklahoma are listed on the U.S. Department of Agriculture (USDA) Agricultural Marketing Service website as companies that meet USDA Good Agricultural Practices (GAP) acceptance criteria.

**Figure 1. Census of Agriculture**



A wide variety of produce is grown in Oklahoma, including ready-to-eat produce with the edible portion grown in contact with the soil and also ready-to-eat produce that is not grown in contact with the soil. The method and timing of application of the raw animal manure to produce production areas could have an impact on food safety risks.

The number of Oklahoma produce farms that use untreated animal manure in the growing of ready-to-eat produce is unknown. Also unknown is whether produce growers that use untreated animal manure in growing ready-to-eat produce are aware of the food safety risks, and whether these producers are using GAPs to mitigate these risks and monitoring protocols to effectively monitor the level of risk.

**Problem Statement**

The Oklahoma Department of Agriculture, Food & Forestry (ODAFF) lacks comprehensive knowledge of the extent to which raw animal manure is used by ready-to-eat produce farmers, the degree of risk posed by the use of raw animal manure by these producers, and the typical level of producer knowledge regarding food safety risks, GAPs, and regulations associated with the use of raw animal manure in the production of ready-to-eat produce.

## Research Question

1. How common is raw animal manure use among producers of ready-to-eat produce?
2. What is the degree of risk posed by the use of raw animal manure by these producers, based on their method and time of application?
3. What is the typical level of producer knowledge regarding the food safety risks, GAPs, and regulations associated with the use of raw animal manure in the production of ready-to-eat produce?

## Methodology

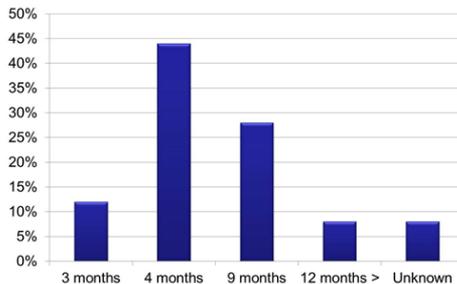
A random sample of Oklahoma producers was selected from three public database directories available through the ODAFF. These directories included the list of organic producers certified by ODAFF and two Oklahoma Buy Fresh Buy Local guides—one for the central region of Oklahoma and one for the Northeast region. An electronically-delivered, ten-question anonymous survey was sent to 85 producers, and 17 responded. A follow-up mail inquiry was then sent to all 85 producers, asking those that had not completed the electronic survey to complete and return a paper survey; nine were received. Finally, all 85 producers were called, and 15 who had not responded accepted invitations to complete the survey through individual or group interviews.

Of the in-person interviews, seven were individual interviews and two were group interviews. The length of the producer interviews ranged from five minutes to thirty minutes. Thirteen of the producers were from smaller produce farms, and two producers were from larger produce operations.

## Results

Ninety percent of the producers market their produce directly to the consumer. Sixty-one percent of these producers use untreated raw animal manure as part of their fertilization program for the produce they grow. Sixty-four percent of those producers apply the untreated animal manure in the fall, and 80% of these producers incorporate the untreated animal manure into the soil in some manner. Figure 2 illustrates that 56% of the producers surveyed apply raw animal manure four months or less prior to harvest. None of the producers participating in the survey are testing produce at harvest for pathogens.

**Figure 2. Time Interval—Application of Untreated Animal Manure Until Harvest of Product.**



## **Conclusions**

Untreated animal manure is being used cautiously by some producers as demonstrated by the fact that 44% of those surveyed reported application of raw animal manure greater than 9 months prior to harvest of ready-to-eat produce. Other producers appear unaware of the potential risks associated with the use of untreated animal manure as demonstrated by the fact that 56% of those surveyed reported application of raw animal manure 120 days or less prior to harvest. A portion of these producers use the 90/120-day interval as a rule of thumb to minimize food safety risks. However, the 90/120-day rule does not have a direct food safety objective. The primary objective in the National Organic Program Rule, 7 CFR Part 205 § 205.203, offers standards that are meant to maximize soil fertility; the 90/120-day rule can be found under this subpart. None of these producers are doing any type of testing of the produce at harvest for pathogens.

## **Recommendations**

1. A larger, more rigorous study that measures the potential food safety risks throughout Oklahoma should be researched. Similar studies could be conducted in other states.
2. Training programs could be established through collaboration between federal, state, local, and tribal regulatory agencies and also industry and academia to develop risk-based best practices to support enhanced food safety.
3. Outreach should involve identifying the intended audience and effective methods of outreach for that audience. The produce industry has largely been unregulated in the past, so identifying and reaching these producers may prove to be challenging. Farming organizations and land grant university extension programs could be used to identify and then reach out to these producers.
4. Producers could be educated to institute risk-based preventive practices that mitigate known risks and enhance the production of a safe supply of produce. Also, education of these producers should be conducted to ensure that preventive measures are being taken in the production of ready-to-eat produce.

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# Evaluating Manufactured Food Inspection Program New Hire Training Costs and Staff Turnover in Select AFDOSS States

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## Abstract

This study compared training costs for onboarding new inspectors among the Association of Food and Drug Officials of Southern States (AFDOSS) of Florida, Georgia, North Carolina, Tennessee, and Virginia to meet nationally recognized Manufactured Food Regulatory Program Standards (MFRPS). Data were gathered through electronic surveys and telephone interviews, as well as in-person interviews, and adjusted for policy and program differences. The study concluded the total cost of training a new manufactured food inspector over the entire onboarding process can be over \$235,000. The author recommends that states with high turnover rates identify the causes for their turnover and suggests that there is a need to investigate funding models to leverage training resources for state inspection programs. Finally, the study recommends that the Manufactured Food Regulatory Program Alliance (MFRPA) conduct a similar, expanded study to determine training costs and turnover rates on a national level and then determine possible solutions with the Food and Drug Administration (FDA). The states in this study represent 16.5% of the population in the United States (U.S. Census Bureau, 2015), therefore the impact of training costs at a national level would be much greater. Limitations of the study included lack of prior research, and inspection program differences.

*Keywords:* Onboarding, training

## Background

The Manufactured Food Regulatory Program Standards (MFRPS) were developed by the FDA in conjunction with state program managers to serve as a foundation for manufactured food inspection programs and to promote the continuous improvement of these programs (MFRPS, 2007). The MFRPS consist of ten standards that establish requirements necessary for regulatory programs to protect the public from foodborne illness and injury (MFRPS, 2007). One goal of the MFRPS is to establish uniform risk-based inspection programs throughout the United States, which will result in a safer, more secure food supply (MFRPS, 2007). A second goal of the MFRPS is to improve communication between state and federal partners. Interagency communication is crucial for the development of an integrated food safety system, and will be an integral part of implementing the Food Safety Modernization Act (FSMA).

The MFRPS were first piloted in 2007, and, starting in 2008, states were able to enroll in the MFRPS as part of the Rapid Response Team (RRT) cooperative agreement (FDA, 2008) or through a state food inspection contract. Standard 2 of the MFRPS outlines a training program for manufactured food inspectors consisting of coursework and field training that must be completed within the first 24 months of the inspector's start date. Standard 2 defines the basic training elements for a manufactured food inspector. However, the actual training elements required by each inspection program can vary. The cost of training new inspectors to achieve this level of competency can be a

significant expense for manufactured food inspection programs. These costs are multiplied by staff turnover. State manufactured food inspection programs will likely play a key role in the implementation of new regulations created by the passage of FSMA. As a result, state programs will require additional training that will further increase training costs for all states. Understanding the absolute and relative costs of such training would aid food program managers in better understanding the true cost of their programs.

### **Problem Statement**

The cost of training new employees in the AFDOSS region to meet the MFRPS Standard 2 training requirements is unknown.

### **Research Question**

1. What is the cost for state programs of training a new employee to meet MFRPS Standard 2 requirements?
2. What is the average annual turnover rate for state programs?
3. What are the total annual program costs for training new employees?

### **Methodology**

In an effort to understand these annual costs, manufactured food program managers within state departments of agriculture in the Association of Food and Drug Officials of the Southern States (AFDOSS) region were surveyed to estimate training costs. Each of the programs surveyed are enrolled in the MFRPS. The AFDOSS states consist of 11 states and the U.S. Commonwealth of Puerto Rico. Departments of agriculture in the states of Florida, Georgia, North Carolina, Tennessee, and Virginia were selected for the survey in order to keep the sample a manageable size, given the research project's resources. These states represent 16.5% of the population in the United States (U.S. Census Bureau, 2015).

A questionnaire was developed and designed to capture program information including: the length of time a state has been enrolled in the MFRPS; the size of the food safety program (number of regulated food establishments and number of manufactured food inspectors); the training timeline and requirements; training costs; and inspection staff turnover. The questionnaire was delivered via email to manufactured food program managers in the AFDOSS region, who were all pre-existing contacts of the author. Follow-up telephone interviews were conducted to expand upon their questionnaire responses.

A cost calculation was performed to capture the expenses incurred over the entire training period. In the training period during the onboarding process, the employee acquires the knowledge, skills, and abilities necessary to become a competent manufactured food inspector. Therefore, the entire period was evaluated rather than just looking at the costs associated with a series of individual training events. The elements factored into the training cost calculation over the onboarding period included: 1) inspector salaries, 2) inspector benefits, 3) salaries and benefits for trainers' time spent with the inspector, 4) travel costs, and 5) indirect costs.

Annual turnover rate was calculated by dividing the number of inspectors who left each program annually since enrolling in the MFRPS by the number of full-time manufactured food inspector positions available. Average annual turnover (the average number of inspectors who left each program annually) was calculated by dividing the number of inspectors who left since enrolling in the MFRPS by the number of years enrolled. Total annual training costs were calculated by multiplying the annual training cost per new inspector by the average annual turnover (See Figure 1).

**Figure 1: Turnover Calculation Formulas**

Annual Turnover Rate <i>ATR</i> is: $ATR = \left[ \frac{(L/A)}{Y} \right] \times 100$	Average Annual Turnover <i>AAT</i> is: $AAT = \left[ \frac{L}{Y} \right]$
Where: inspector positions available L = number of inspectors who left each program since enrolling in the MFRPS	A = number of

In three of the five programs, there are no staff dedicated solely to performing manufactured food inspections. All inspectors in these programs perform both retail and manufactured food inspections. To account for this, a Full Time Equivalent (FTE) calculation was performed to determine the number of personnel available for performing manufactured food inspections. The number of manufactured food FTEs was calculated by determining the number of hours used in performing manufactured food inspections annually, using inspection data provided by the program managers.

**Figure 2: FTE Calculation Formula**

Manufactured Food Full Time Equivalent <i>FTE</i> is: $FTE = \left[ \frac{(I+H)}{F} \right]$
Where I = number of manufactured food inspections per year (high, medium and low risk) H = average hours per inspection (high, medium low risk) F = number of hours that equals one full time employee

Four of the five programs in the study population are enrolled in the Voluntary National Retail Food Regulatory Program Standards (VNRFRPS) in addition to the MFRPS. For these programs, the training path for a manufactured food inspector begins with completing the basic training required in Standard 2 of the VNRFRPS. The retail training costs for these programs were included in the study because they are a pre-requisite for entering the manufactured food training program.

**Results**

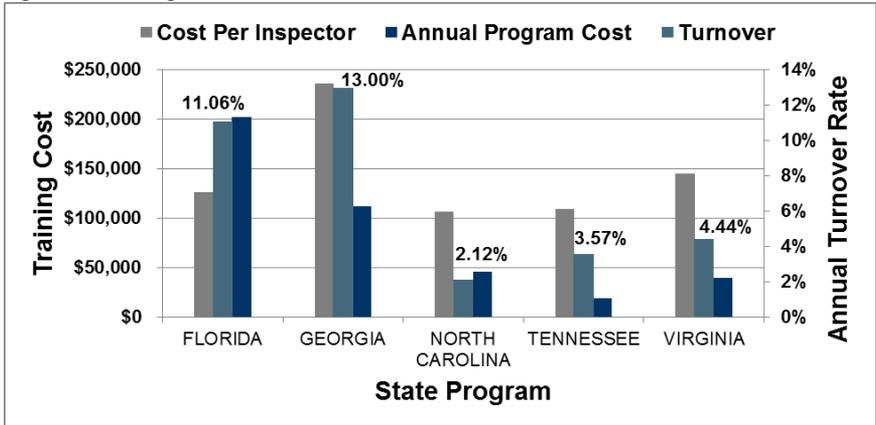
The programs in the study were found to vary greatly in size and structure. The earliest enrollee in the MFRPS was North Carolina in 2007, with the most recent program being Tennessee, which enrolled in 2012. The number of manufactured food firms regulated by each program ranged from 1,297 to 5,500. The number of manufactured food FTEs ranged from 7 to 29. Four of the five programs had a three-tiered risk-based inspection frequency, while one program had a two-tiered risk-based inspection frequency. Inspection frequencies ranged from once every 24 months, to four times per year (See Figure 3). Four of the five programs indicated that they need at least one additional FTE, and as many as 19 additional FTEs, to meet current inspection frequencies.

**Figure 3: State Manufactured Food Program Summary**

		FL	GA	NC	TN	VA
MFRPS Program Enrollment Year		2008	2009	2007	2012	2009
Current Number of Inspectors		29	11	27	10	7
Number of Firms		4986	2981	5500	1297	2337
Inspection Frequency	Low Risk	18 mos.	12 mos.	24 mos.	12 mos.	24 mos.
	Med Risk	12 mos.	6 mos.	N/A	6 mos.	14 mos.
	High Risk	6 mos.	3 mos.	12 mos.	3 mos.	10 mos.
Training Period		24 mos.	36 mos.	9 mos.	24 mos.	21 mos.

The programs in the study spend an average of \$146,276 on training each new manufactured food inspector, with the lowest cost being \$106,714 and the highest being \$235,828. The average inspector annual salary was \$49,993, including benefits. The average indirect cost rate was 20.19%. The average annual inspector turnover rate was 6.84%, with the lowest turnover rate being 2.12% and the highest being 13.0%. After factoring in the cost per inspector and annual turnover rates, the average total annual program cost of training new manufactured food inspectors was \$84,395, with the lowest being \$19,572 and the highest being \$202,637 (See Figure 4).

**Figure 4: Training Costs and Turnover Rates**



**Conclusions**

There were several limitations to this study, the first being the lack of available research on the subject. A keyword search with different variations of the terms “food, inspector, training, cost” was performed using several research databases including JSTOR and EBSCO, with no relevant results returned. There were also differences in program structure and policy that had to be accounted for, such as inspectors performing both retail and manufactured food inspections in some programs, and only either retail or manufactured food inspections in other programs. Another limitation was that all of the programs did not enroll in the MFRPS at the same time, so the programs were at

different stages of conformance, and turnover calculations were based on different timeframes.

There were extensive variations among the programs in the costs for training new inspectors. The two greatest contributors to these variations were the training period, which ranged from nine to 36 months, and the differences among the programs in required courses. For example, inspectors in one state may be required to complete multiple advanced FDA courses. In another state, advanced training is required based on geographic need, and in another state, advanced training is only required for higher-level inspector positions.

## **Recommendations**

1. Further research is needed to determine the costs associated with the time spent only on training, as opposed to costs associated with the entire onboarding period.
2. Florida and Georgia, whose turnover rates are 11% and 13% respectively, should evaluate the causes for their turnover rates, which were higher than the other states in the study. Similarly, other states outside of AFDOSS should consider performing assessments of their programs in order to determine the causes of their turnover. These assessments may help identify actions that could reduce high turnover rates, or otherwise lower costs.
3. States should perform assessments to determine the additional training needs and other resources required for the implementation of FSMA, and the costs associated with those resources. These assessments may assist states with resource allocation as they prepare for FSMA implementation.
4. Given the high agency cost for training a manufactured food inspector, there is a need to investigate funding models to leverage training resources for state inspection programs.
5. The Manufactured Food Regulatory Program Alliance (MFRPA) should consider conducting a similar study to determine training costs and turnover rates on a national level, and then determine possible solutions with the FDA.

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# Change Management Practices by State and Local Food Safety Regulatory Agencies

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## Abstract

This study examined the responses of state and local food safety employees, whose agencies have undergone program transformations, as to whether or not change management practices were in place. The study was conducted via an online survey to gather qualitative data on the use of change management practices by state and local food safety employees who experienced program changes within a period of the last 10 years, or since 2005. The survey was sent to 289 people within the Association of Food and Drug Officials' Directory of State and Local Officials and had a 26% response rate. The participants that met the study population criteria were asked a series of questions to determine if transition plans are used and if change management practices are implemented. The study suggested that change management practices may be present. However, whether or not these practices are related to program changes and transition plan implementation is unclear. The findings of this study indicate that education and outreach may be needed in the area of change management practices within upper management of food safety programs to help ensure successful program reforms and change initiatives.

*Keywords:* change management, state and local food safety program, transition plan

## Background

State and local food safety agencies may implement change initiatives for a variety of reasons. Some of the reasons may be to standardize programs, create efficiencies, implement cross-training, and/or assign inspectors additional or new work assignments. Federal and state cooperative agreement programs, such as the Manufactured Food and the Voluntary National Retail Food Regulatory Program Standards, are also an impetus for change by state and local food safety programs. State and local food safety agencies may implement transition plans and apply change management practices to ensure the intended outcomes for a change initiative are achieved. As the nature of foods and food preparation processes changes, regulatory agencies must change to accommodate these developments.

A transition can be seen as either a process or a period of change from one state or condition to another (Oxford dictionaries, 2015). For example, when cross-training provides retail food inspectors with the knowledge of how to inspect food manufacturing facilities, this kind of knowledge transfer enhances the inspectors' existing abilities. This type of change in duties requires careful planning at the managerial level in order to be deemed successful. Transition planning puts the goals, priorities, and strategies in place for a successful transition (Entrepreneur Media Inc., 2006).

Change management is explained by Kotter (2011) as “a set of basic tools or structures intended to keep any change effort under control.” These tools minimize disruptions during the change process and help to ensure the processes are done efficiently and at a pace and in a manner that are congruent with the specified objectives. According to Van Velsor et al. (2010), change management is defined as “effective strategies to facilitate organizational change initiatives and to overcome resistance to change” (p. 5). An example of an outcome is conformity with the Food and Drug Administration’s Manufactured Food Regulatory Program Standards. The outcome is the desired organizational objective, which is the direct result of multiple processes and their associated outputs (Improvement Skills Consulting LTD., 2011, p.2).

Without a clearly-defined transition plan that also addresses core competencies required of new responsibilities, the desired outcomes may not be realized as intended. Ideally, change management results in the intended outcomes of a change initiative. Food safety programs undergoing changes may not fully realize the intended positive impacts if transition plans and change management practices are not drafted, communicated effectively with staff members tasked with handling the changes in various capacities, and implemented fully.

### **Problem Statement**

The extent to which change management practices are utilized within state and local food safety agencies is unknown.

### **Research Question**

To evaluate whether change management practices are in place, this study was designed to answer the following research questions:

1. Do state and local regulatory agencies prepare, communicate, and implement transition plans when change initiatives occur?
2. Is employee input allowed during the transition plan development process?
3. Do transition plans address competencies identified for changes in work assignments, provide adequate training for the new competencies, and outline new employee responsibilities?
4. Do the transition plans have realistic timelines for implementation, are they effectively implemented, and are they the right solution for the change initiative?

### **Methodology**

An exploratory survey was conducted via the web-based instrument Survey Monkey (SurveyMonkey, Inc.). The study population included 289 full-time state and local food safety employees listed in the Directory of State and Local Officials (DSLO) published by the Association of Food and Drug Officials (AFDO). The study did not include tribal agencies, as they are exempt from most regulatory oversight and do not meet the population criteria. The survey comprised a total of nine questions, a two-step selection process, and two screening questions.

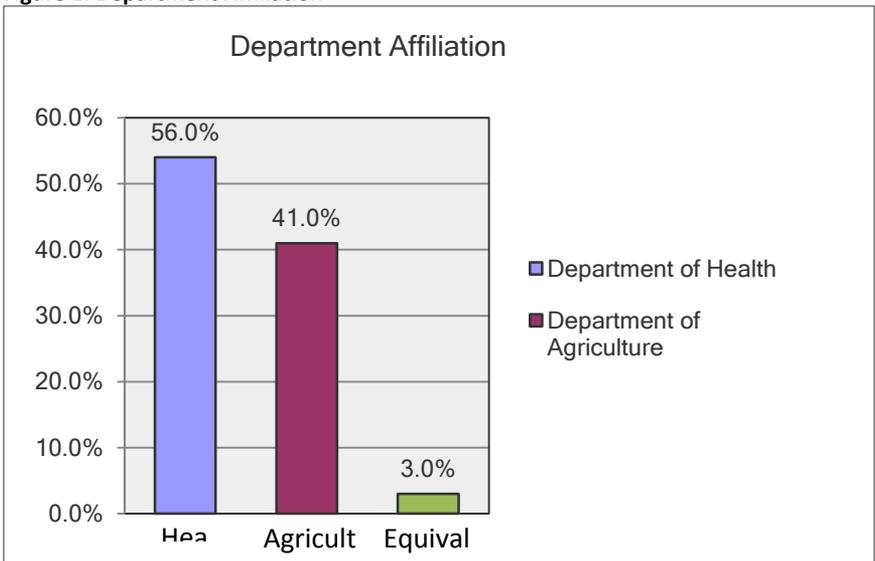
The first step was comprised of eight questions, five of which were to collect demographic information with a screening question to select for state and local food safety employees. Next, a screening question eliminated those participants that had not experienced program changes within the last 10 years. The respondents were then asked if they were familiar with the term “change management” and were asked if they believed a transition plan was provided by upper management for the change their program underwent.

The second step was comprised of nine questions. The purpose of these questions was to determine if transition plans were implemented as a result of change initiatives, thus reflecting change management practices. These questions provided insight into the change management practices used by the respondents’ agencies from a personal perspective.

### Results

A total of 75 participants (26%) responded to the survey within a three-week period. Seventy-one respondents were employed as state or local food safety employees; four respondents were removed because they did not meet the population criteria. Thirty-seven respondents were employed by Departments of Health (56%), twenty-seven were with Departments of Agriculture (41%), two came from (3%) equivalent departments, and 5 did not answer, bringing the total for statistical analysis to a total of 66 respondents (4 were previously screened out of the survey) (see Figure 1).

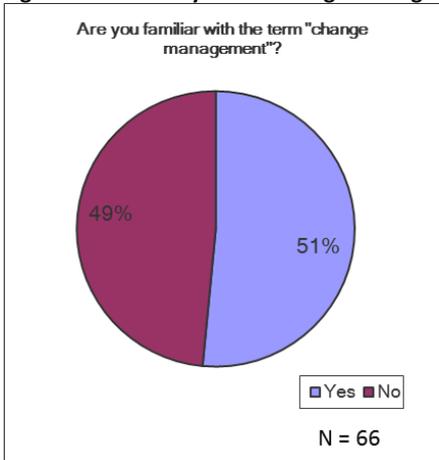
**Figure 1. Department Affiliation**



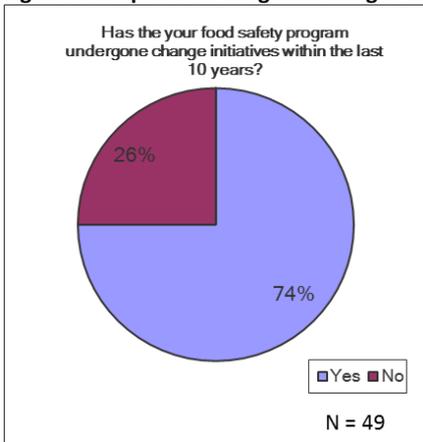
Of the 66 individuals with identified employers, 51% were familiar with the term “change management” and the remainder was not. Forty-nine respondents (74%) of the 66 individuals indicated their food safety program had undergone or implemented a change initiative within the last 10 years (see Figures 2 and 3). Examples of the change initiatives provided by respondents included cross-training, food safety program re-

organizations, Lean Six Sigma, and other transformations that resulted in changes in work assignments.

**Figure 2. Familiarity With “Change Management”**



**Figure 3. Response to Program Changes Within the Last 10 Years**



The 49 respondents who had experienced program changes within the last 10 years were asked if they believed that a transition plan was implemented to address the change initiative. Of the 49 respondents, 23 (55%) indicated a transition plan was provided; 42 provided responses, while 7 respondents skipped this question.

The 42 respondents were asked a series of questions about their experience with the program changes within their agency. The questions were intended to determine if they felt their organization had implemented transition planning. As shown in Table 1, a majority of respondents believed transition planning was effectively implemented for the change initiative and was the right solution.

**Table 1. Synopsis of Transition Plan Survey Findings**

Topics Addressed by the Transition Plan	Responses (N = 42)			
	Yes	No	Unsure	N/A
Was provided by upper management?	40%	38%	10%	12%
Was explained and communicated?	46%	26%	7%	21%
Was effectively implemented?	43%	26%	12%	19%
Allowed for employee input?	43%	31%	7%	19%
Addressed the core competencies required of the changes in work assignments?	48%	21%	10%	21%
Provided adequate training for the new competencies required?	52%	22%	7%	19%
Outlined new employee responsibilities?	48%	19%	12%	21%
Timeline for implementation was realistic?	36%	26%	17%	21%
Was the right solution for the identified problem(s)?	50%	12%	19%	19%

1. Over 40% of the respondents felt that a transition plan was provided, communicated, and effectively implemented when change initiatives occurred.
2. Employee input was allowed during transition, according to 43%.
3. About 48% reported that the transition plan addressed core competencies for the changes in work assignments.
4. Fifty-two percent believed that adequate training was provided for in the transition plan.
5. Forty-eight percent reported that the transition plan included and outlined new employee responsibilities.
6. A total of 43% believed that the transition plan was implemented effectively. However, only 36% felt the timeline for implementation was realistic.
7. Half the respondents believed that the transition plan was the right solution for the change initiative.

### Conclusions

The survey results suggested that change management practices may be present; however, whether or not these practices coincide with successful change initiatives and transition plan implementation is unclear.

## Recommendations

Based on the results and conclusions of this research project, the following recommendations are made for food safety agencies to consider:

1. State and local regulatory agencies should prepare, communicate, and implement transition plans when change initiatives occur to ensure the desired outcomes are achieved.
2. Employees who are directly impacted should be given the opportunity to provide feedback on proposed program changes.
3. Transition plans should include a detailed outline of the core competencies required for the new assignment(s) and outline the employee's respective roles and responsibilities.
4. As transition plans are implemented, upper management and leadership should ensure change management practices are actively exercised throughout the entire change process.
5. Upper management and leadership should evaluate the effectiveness of the transition plans employed and alter the plans to maximize the efficacy and ease of future transitions.

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# Surface Pathogen Elimination Practices for Ready-to-Eat Fishery Products

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## Abstract

This study examines fishery industry knowledge of surface pathogens and usage of surface pathogen elimination procedures (SPEP) on ready-to-eat, non-heat treated fishery products (NHTFP) in a convenience sample of 17 establishments in four New York City boroughs and Suffolk County, New York during the fall of 2014. These establishments included dockside unloaders, wholesale seafood distributors/fillet houses, wholesale sushi processors, wholesale cold smoked fish processors, wholesale cured fish processors, and restaurants. The study concluded that in this sample: (1) most establishments lacked appropriate surface pathogen knowledge and an SPEP; (2) cold smoked establishments appeared to be creating a potential *Clostridium botulinum* hazard (CBOT); and (3) the U.S. Food and Drug Administration (FDA) Fish and Fishery Products Hazards and Controls Guidance Document (Hazards Guide) and the FDA Food Code (Food Code) do not sufficiently address surface pathogen elimination and associated hazards. Recommendations include: (1) NHTFP establishments should have an SPEP in place; (2) the Hazards Guide and the Food Code should add SPEP information; and (3) sanitation guidance should be created for commercial fishermen and harvesters of fish.

*Keywords:* surface pathogen elimination procedures, cold smoked fish, *Clostridium botulinum*, sushi, cured fish, *Listeria monocytogenes*, *Salmonella*, seafood HACCP, commercial fishing, acidified sodium chlorite, calcium hydroxide, peroxyacetic acid, water phase salt (WPS), water activity ( $a_w$ )

## Background

Ready-to-eat, non-heat treated fishery products (NHTFP) such as cold smoked fish, cured fish, ceviche, sushi/sashimi, and gravlax are widely consumed throughout the U.S. Recent changes in consumer preferences such as an increase in consumption of “raw” products (e.g., sushi) increased the demand for NHTFP in the U.S. This increased demand also increased the potential for foodborne illnesses due to a variety of factors.

The FDA Seafood Hazard Analysis and Critical Control Points (HACCP) Regulations 21 Code of Federal Regulations (CFR) 123; the FDA Seafood and Seafood Products Hazards and Controls Guidance Document, 4th Edition (Hazards Guide); and the Food Code identify control measures for numerous biological pathogen hazards. However, the Hazards Guide and the Food Code do not cover surface pathogen elimination for establishments that process NHTFP. Additionally, the Hazards Guide does not provide specific guidance for processing of cold smoked fish in which spoilage microorganisms are significantly reduced (likely occurring during a chemical based surface pathogen elimination procedure [SPEP]). In addition, the FDA Food Code does not cover the control of surface pathogens on raw fish that is to be processed and served at retail as an NHTFP.

Commercial fishing vessels are exempt from the FDA Seafood HACCP regulation 21 CFR 123.3(k)2(i) & (ii). However, a study conducted by the Institute of Food Technologists in 2001 found 62% of surface water samples from fishing grounds were contaminated with *Listeria monocytogenes* (Lm) (IFT, 2001). Fish harvested from waters contaminated with Lm can have an increased risk of contamination with between 0-50% of fresh fish samples testing positive for Lm in literature reviewed by Embarek(1994). NHTFP are frequently implicated in foodborne illnesses and food recalls in the United States. For example, in 2012, a multistate outbreak of *Salmonella* Bareilly and *Salmonella* Nchanga was linked to raw scraped ground tuna with a total of 425 people infected with the outbreak strains over 28 states and the District of Columbia, with 55 people being hospitalized (CDC, 2012). In addition, Lm was responsible for 32 NHTFP Class 1 recalls in New York between 2002 and 2014, according to the New York State (NYS) Food Laboratory records.

The NHTFP contamination problem is made more acute by the lack of labeling requirements. The FDA has set a zero tolerance for Lm and *Salmonella* in ready-to-eat (RTE) fish and fishery products that are sold at wholesale (Federal Food, Drug, and Cosmetic Act, 21 U.S.C. 342(a)(1)) (FDA, 2011). However, fish purchased by wholesale processors and retailers of NHTFP are often accompanied by written assurances that the fish was processed under Seafood HACCP, yet the distributor's Seafood HACCP Plan identified the product as needing to be "cooked by end user." There is no requirement for wholesalers to label fish boxes or otherwise indicate on invoices that the product is RAW or RTE. The identification of the product as RAW or RTE is only required on a Seafood HACCP Plan, which, in most cases, is not provided to the purchaser. As a result, contaminated raw fish and fishery products may migrate through the food supply chain to consumers who believe that the product is RTE.

### **Problem Statement**

Ready-to-eat, non-heated treated fishery products may reach the consumer without being treated with a surface pathogen elimination procedure.

### **Research Question**

Three research questions were developed in order to investigate surface pathogen elimination along the supply chain of NHTFP processed in New York City and Suffolk County, NY:

1. What do fish industry dockside unloaders, wholesale manufacturers, wholesale distributors, and retailers know about surface pathogens on NHTFP?
2. What control procedures do fish industry dockside unloaders, wholesale manufacturers, wholesale distributors, and retailers have in place to control the presence of surface pathogens on NHTFP?
3. If the NHTFP establishments lack control procedures, would the establishments be willing to institute an SPEP that would be outlined in an official FDA Guidance document?

## Methodology

A comprehensive review of the FDA Fish and Fishery Products Hazards and Controls Guidance Document: 4th Edition (April 2011); the 2013 FDA Food Code; and the NYS Department of Agriculture and Markets Circular 1032 Rules and Regulations Relating to Fish Processing and Smoking Establishments (1990) was conducted in order to verify the technical requirements for seafood processing. Next, seventeen on-site interviews of establishment representatives responsible for food safety were conducted at three fishing industry dockside unloaders, four wholesale fish distributors/fillet houses, two wholesale sushi processors, two wholesale cold smoked fish processors, two wholesale cured fish processors, and four restaurants serving NHTFP. The interviews were conducted in-person by the author using a semi-structured questionnaire. The questionnaire was designed to encourage open-ended comments by the respondents. The typical interview lasted 45 minutes. Finally, the NYS Food Laboratory was contacted, and they provided records of all of the Lm-positive food samples collected from 2002 to 2014 in order to identify the Lm-positive incidences from NHTFP products.

## Results

Approximately 73% of the establishments interviewed (a total of 13) lacked knowledge of surface pathogens on raw fish persisting on ready-to-eat NHTFP. The remaining four establishments with knowledge of surface pathogens included two wholesale cold smoked fish establishments. Both establishments already had a validated SPEP in place. One establishment instituted a calcium hydroxide dip and potable water rinse (proprietary concentration and procedure). The second establishment instituted consecutive dips consisting of acidified sodium chlorite (ASC) and peroxyacetic acid (PAA) (proprietary concentrations and procedures) without any subsequent potable water rinse before curing and smoking. This procedure deviated from chemical manufacturer instructions and regulatory requirements, yet was admittedly done for extra protection. According to management, the lack of rinsing was done for extra protection. However, neither establishment knew their SPEP included chemicals that can also reduce spoilage microorganisms, which are a critical control for the even greater and more deadly hazard of *Clostridium botulinum* (CBOT). Anecdotal evidence links calcium hydroxide dips with a reduction in spoilage microorganisms. ASC has been documented to reduce seafood spoilage microorganisms (Rao, 2007), and PAA has been documented to reduce seafood spoilage microorganisms (Howarth, 2010). Both establishments lacked additional consumer protection measures for CBOT such as time/temperature indicators (TTI) on consumer-sized packages and did not increase the water phase salt (WPS) to  $\geq 5\%$  or decrease water activity (aW) to  $\leq 0.97$  on their cold smoked fish where a TTI was not sufficient.

The remaining two establishments consisted of a wholesale sushi manufacturer and a retail sushi restaurant. The wholesale sushi manufacturer instituted a validated SPEP using an ASC dip that adhered to the chemical manufacturer instructions and regulatory requirements. The retail sushi restaurant, owned and operated by a 4th-generation sushi chef from Japan, had procedures by which whole, previously-eviscerated fish were washed and then dried with rice paper to extract blood and pathogens. For tuna loins purchased, a 4-5 millimeter slice is shaved off the surface and discarded for surface pathogen control. Neither of these implemented procedures had any validation studies conducted to determine their efficacy.

Approximately 86% of establishments interviewed (a total of 15) expressed interest in implementing an SPEP outlined in an official FDA guidance document. Approximately

half of these establishments indicated they would rather purchase fish from a supplier that implemented a SPEP in lieu of developing their own SPEP. The remaining 14% were two dockside unloaders who both admitted not knowing about surface pathogens. Both indicated that they do not want to institute an SPEP, but would rather place the burden of surface pathogen elimination on their customers with documentation that the purchaser would be responsible for surface pathogen elimination. Anecdotal evidence links these dockside unloaders to distributors who sell fish directly to sushi restaurants.

During the interviews, establishments that were unaware of surface pathogens on NHTFP were provided information regarding surface pathogen control. Every establishment requested guidance on SPEP, even if they already had one in place. In addition, the establishments using an SPEP and producing cold smoked fish were informed of potential *Clostridium botulinum* hazards.

## **Conclusions**

The study had a number of limitations. While the 17 establishments represent each of the categories in the NHTFP seafood chain, they are at best only a small sample of the total establishments in this market. In addition, the study focused on self-reported knowledge of one individual responsible for food safety in each establishment, and no testing was carried out. However, the study clearly indicated the extent of the NHTFP surface contamination problem as shown below:

1. The clear majority of establishments lacked knowledge of seafood surface pathogens risks, despite the need for them to be knowledgeable given that up to 50% of raw seafood may be contaminated with Lm.
2. The majority of NHTFP establishments in the study lacked an SPEP, despite the need to conduct an SPEP to safely process NHTFP.
3. Cold smoked fish products that have been processed with an SPEP are being sold despite the possibility that some products can lack adequate CBOT controls. This potential hazard is due to the possibility of the reduction of spoilage microorganisms (which could not be in place to outcompete CBOT cells nor be in place to produce a foul odor when temperature-abused).

## **Recommendations**

The study resulted in a series of recommendations:

1. The NHTFP industry should be provided with information detailing various methodologies in the development and use of SPEPs.
2. Create addendums to the Hazards Guide and Food Code that provide specific guidance when implementing an SPEP that possible additional hazards are created and that add RAW/RTE labeling requirements for NHTFP.
3. Create a commercial fishing vessel/harvester sanitation guidance document with specific controls for surface pathogens and primary processor requirements. Ultimately, harvest vessel sanitation programs need to become a prerequisite program to a structured SPEP and monitored through vessel

records and testing, similar to how primary processors are required to control histamines at receiving.

4. Study cold smoked fish processing when SPEP are used that have been determined to significantly reduce or eliminate spoilage microorganisms. The study, at minimum, should address processing controls for CBOT and other pathogens in relation to WPS/aW, nitrites (where allowed), maximum smokehouse temperature, maximum smoking time, smoke contact before/after pellicle formation, and the use of TTIs and other factors deemed critical for the safe production, sale, and consumption of cold smoked fish.

## Acknowledgments

I would like to express my utmost gratitude to the following people: Supervisor Roxanne Hill (New York State Department of Agriculture and Markets) for providing continuous support and insight as a supervisor and Cohort 2 Fellow; Ms. Alyssa Dickey, New York State Food Laboratory, for painstakingly sorting through 12 years of *Listeria monocytogenes* samples; Mr. Cameron Smoak, IFPTI Mentor, for providing hours of endless wisdom and calm through my journey as a Fellow; Dr. Paul Dezendorf, IFPTI Subject Matter Expert, for having a New York mindset that propelled me to excel immeasurably; Dr. Craig Kaml, IFPTI Subject Matter Expert, for providing unobjectionable critical analysis which cleared the path for success; and the entire IFPTI staff for everything humanly possible in creating a world class educational environment. Last, but not least, I would like to acknowledge my "fellow" Fellows for their friendship, support, knowledge and camaraderie through this journey we embarked on together as a uniquely-bonded group of professionals.

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# Barriers to Inspections of Ethnic, Women-Operated Food Establishments in Dallas, Marshall, and Polk Counties, Iowa

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## Abstract

This small exploratory study examined the interaction between Hispanic and Asian women food establishment operators and food safety inspectors of the State of Iowa in Polk, Dallas, and Marshall counties. The author sought to help inspectors better understand the barriers to working with operators by conducting in-person, one-on-one interviews with a women interviewer, the author, and operators in their own establishments. The interviews lasted an average of one hour and included closed- and open-ended questions about the operator's perceptions of barriers to inspector-operator interaction due to differences in language and culture; previous experience with regulation; and attitudes toward government regulation. Content analysis was used to identify the primary themes and prepare a composite description of the eighteen interviews. This composite description was provided to eighteen veteran food safety inspectors in Iowa with a minimum of four years of experience in food establishment inspections. The feedback from those regulators along with the results of the interviews was used to draw conclusions. The limitations of the study include a small number of subjects in a limited geographic area; the lack of a control group of non-ethnic establishments from the same area; and only an elementary content analysis of the notes from the interviews. These limitations can be addressed through a larger study that includes additional ethnic groups and more detailed interview questions.

*Keywords:* language, woman operators

## Background

The role of ethnicity has become more important in recent years in the food industry due to three factors: immigration, tourism, and international trade, as an increasingly diverse population experiencing greater travel abroad interacts with the growing availability of imported foods (Rossiter and Chan, 2004). In fact, the New York Times reported back in 1992 that ketchup was being outsold by salsa by \$40 million in retail stores (Seitz-Wald, 2015). Expanded tourism has driven the growth of experimental menus in major U.S. cities with items such as “cuitlacoche” and parboiled grasshoppers (Hodgeman, 2015). The combination of a population experiencing new foods and willing to experiment with imported foods results in heightened food safety risks as demonstrated in the greater numbers of foodborne illness outbreaks associated with ethnic food establishments (Simonne et al, 2004; Fraser & Alani, 2009). Despite the apparent need for more knowledge about ethnic food safety issues, there has been very little research into ethnic food establishments (Sukalakamala and Boyce, 2007), and almost no published research exists directly addressing how to reduce ethnic food safety problems (Lee, Hwang, and Mustapha, 2014).

The changes in the food culture and food industry in Iowa reflect the changes of the nation. The Iowa Department of Inspections and Appeals estimates that there are

14,900 food establishments in Iowa, and the author estimates that approximately 300 are “ethnic,” based on an internet search using terms such as Mexican, Indian, Chinese, Pho, etc. Ethnic food establishments in Iowa will likely continue to expand in number in the coming years.

Food safety regulatory culture in Iowa in the past focused on mainstream culture establishments. However, ethnic operators’ characteristics can create barriers to inspector-operator interaction that are different from the barriers faced by an inspector dealing with the mainstream population. These barriers may involve the following factors: differences in language and culture; previous history of interaction with government employees; and current attitude toward government regulation. These factors were identified by the author from her experience as an ethnic food establishment operator. Failure to address these barriers is likely to be associated with operator misrepresentation, reduced willingness to participate in training, and communication of distrust/mistrust to employees.

### **Problem Statement**

The prevalence and nature of barriers to regulator-operator interaction involving women-operated ethnic food establishments in the target counties of Dallas, Marshall, and Polk, Iowa, is known only anecdotally.

### **Research Question**

1. What is the opinion of women ethnic establishment operators in the target counties about the historical relationship between food safety regulators and ethnic establishments?
2. What problems do these operators believe currently exist regarding language and culture in their interaction with food safety regulators?
3. What do ethnic women operators view as the greatest barriers during inspections?

### **Methodology**

The project included interviews with a purposive sample of five Asian and three Hispanic ethnic operators from October, 2014 through January, 2015. The interviews were not recorded, in order to encourage openness about sensitive topics. Instead, the interviewer took notes. The operators were told that the information would be treated as anonymous and the notes were shown to them at the end of the interview. The results of the interviews were subject to an elementary content analysis where the primary themes for each question were identified along with illustrative quotations.

The project also included a mailed survey covering the same topics sent to eighteen food inspectors of the Iowa Department of Inspections and Appeals. Information from the thirteen who responded was subject to an elementary content analysis where the primary themes were identified along with illustrative quotations.

## Results

Because this study only sought to provide an initial description regarding arbitrarily chosen barriers based on the author's perception, the results are provided below in a narrative manner based on the elementary content analysis without any attempt to identify numbers or intensity of individual responses.

The women operators in these Iowa counties generally described both positive and negative experiences in working with inspectors. Positive experiences included: (1) the inspector took the time to explain violations; (2) the inspector did not rush the operator during the inspection; (3) the inspector was personable; (4) the inspector provided positive feedback during the inspection; (5) the inspector appeared to be building a relationship with the operator; (6) the inspector instilled knowledge to help the operator improve her business; (7) the inspector left notes on the inspection report that the operator could have translated; (8) the inspector understood her culture and used resources to overcome language barriers such as translated handouts, cell phones and smart apps, videos, the internet, and/or interpreters (either a child, a friend of the operator, or a professional interpreter); and (9) the inspector showed or drew pictures to help explain something to the operator.

One operator, however, noted that some inspectors did not take the time to go over the cited violations, ask questions, and listen to the operator's explanation. One operator added that some violations could have been corrected at the time of inspection.

Most of the woman operators indicated that there are currently no problems with the inspection process, and that no improvements are needed. However, some operators identified problems such as: inspectors don't understand how some food is cooked in other cultures; inspectors don't know multiple languages; inspectors don't provide enough education to the operators; the inspection process doesn't last as long as the operator wants; and inspections are conducted at an inconvenient time.

The inspectors who completed the survey indicated that current problems with the inspection process include the Food Code and educational materials and handouts not being translated into different languages; a lack of video training materials; and a lack of available interpreters. Survey respondents also suggested an increased use of cell phones or tablets by inspectors, and that there be more training opportunities for inspectors.

Two Asian operators and one Hispanic operator indicated having no barriers related to the inspection process. The remaining women, however, identified various barriers including language and culture, education, misinterpreted violations, and the inconvenience of the inspection times. Hispanic women operators focused on language as the greatest barrier to the inspection process, stating that there were not enough bilingual inspectors. However, one Hispanic woman stated that someone at her establishment would be available to translate in the event of any misunderstanding. One Asian interviewee, who speaks a little English, said that she could understand the inspector, but needed the inspector to point out violations during the inspection process so that she could see the violation.

Some of the inspectors completing the survey indicated that gender may be a barrier to a successful inspection. One respondent indicated that Asian woman operators will not

talk with a male inspector, or will seek permission from their husband before speaking with the inspector. Another respondent stated that some male operators are difficult to work with, and that some male operators will not work with female inspectors. Other survey responses related to barriers to the inspection process included financial restraints, resistance to change, and a lack of food safety knowledge.

### **Conclusions**

Asian and Hispanic women operators generally reported having positive experiences working with food regulators. However, some negative experiences were reported, and were generally related to the time taken by the inspector to explain things and/or listen to the operator.

Most of the current problems appeared to be related to language issues such as a lack of bilingual inspectors, a lack of interpreters, and a lack of food safety resources (educational handouts, the FDA Food Code, training materials, etc.) translated into different languages. Other problems identified by the operators were related to the behaviors and actions of the inspector toward the operator during the inspection.

### **Recommendations**

Multiple issues were identified, both by the interviewees and the inspectors, that may represent problems associated with inspecting establishments operated by women, including language, culture, gender, and inspector behavior. However, the major limitation of this study is its exploratory nature involving a very small and purposive sample: eight food service establishment operators in three adjacent Iowa counties, along with written surveys mailed to eighteen inspectors.

In order to further explore these potential problems, this study should be replicated on a much larger scale, i.e., a larger population over a larger area. Such a project could involve collaboration by multiple agencies either within one state or across multiple states.

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# The Impact of Native Language-Based Training on Food Safety Compliance in Suffolk County, New York

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## Abstract

This study examined the effectiveness of native language-based food safety education on subsequent compliance levels in 150 food service establishments (FSEs) in Suffolk County, New York. A quantitative survey of FSE inspection reports was carried out to determine if compliance levels increased after at least one food service worker from the establishment completed the Food Manager's Course provided by the Suffolk County Department of Health Services (SCDHS). A qualitative survey of New York State certified Food Service Inspection Officers from SCDHS was also carried out in order to provide context. Results from the quantitative survey suggest increased compliance following native language-based food safety education when compared with non-native based training. However, qualitative survey results indicate that addressing additional factors may strengthen the effect of education, thus promoting the goal of long-term compliance by FSEs in Suffolk County.

*Keywords:* Compliance through education, Food Manager Course, food service establishment (FSE), language-based training

## Background

Foodborne disease is a common, but preventable, cause of illness worldwide (Jones & Angulo, 2006). The Food Safety Modernization Act (FSMA) identified foodborne illness as a largely preventable public health burden (Food and Drug Administration [FDA] National Retail Food Team, 2009). FSMA's goal is to proactively prevent food safety issues rather than react to problems once they have already occurred. Food safety compliance by food service establishments (FSEs) is particularly important due to the fact that restaurants and delicatessens contribute to two-thirds of outbreaks in the United States (Brown et al., 2014). In 2009, the FDA published results of a 10-year study that tracked the food industry's effort to prevent foodborne illness (FDA National Retail Food Team, 2009). The study concluded that the presence of a certified food manager in FSEs was associated with higher compliance levels with regard to food safety practices and behaviors when compared to those facilities that lacked a certified food manager.

In 1975, Suffolk County became one of the first jurisdictions in the nation to implement and require food safety training. Since that time, providing education has become the trusted method to improve food safety compliance levels by FSEs in the County (C. Sortino, personal communication, 2014). Suffolk County's food safety efforts and requirements are based upon the belief that education increases food safety compliance, which, in turn, will result in the operation of safer restaurants (Brown et al., 2014). A core component of Suffolk's food safety education efforts is the Food Manager's Course, which provides certification in food safety based on nine hours of classroom instruction. In an effort to keep the course content relevant, the course is actively monitored and changes are made to reflect new developments in food safety, as well as to meet the demands of an ever-changing audience.

As in other areas of the country, Suffolk County has experienced a substantial rise in its population of people who do not speak English as their primary language. As of 2010, approximately 20% of the County's 1.5 million residents indicated that they do not speak English at home (U.S. Census Bureau, 2014). In order to provide food safety training to individuals whose primary language is Spanish, Suffolk County introduced a Spanish language version of the Food Manager's Course in 2003. The course is taught by a native Spanish speaker certified by ServSafe®, a nationally-recognized food safety program accredited by the American National Standards Institute (ANSI).

Local health departments differ across states and communities with regard to services provided. Common services provided by most local health departments are food safety education and performance of compliance inspections (Bekemeier, Yip, Dunbar, Whitman, & Kwan-Gett, 2015). Sufficient data and evidence required to adequately justify and distribute funds based upon the intrinsic value of food safety efforts is often not available to public health administrators (Bekemeier et al., 2015). Therefore, a study to determine the effectiveness of food safety education is fiscally and programmatically important.

### **Problem Statement**

There has never been an evaluation to determine the relative effectiveness of the non-English language versions of the Food Manager's Course as compared to the English language version for native speakers of other languages.

### **Research Question**

1. What is the difference in the level of compliance before and after attending a native language-based Food Manager's Course?
2. What variables appear to be associated with the difference between the outcomes during subsequent inspections of establishments where a person has attended the Food Manager's Course in their native language?

### **Methodology**

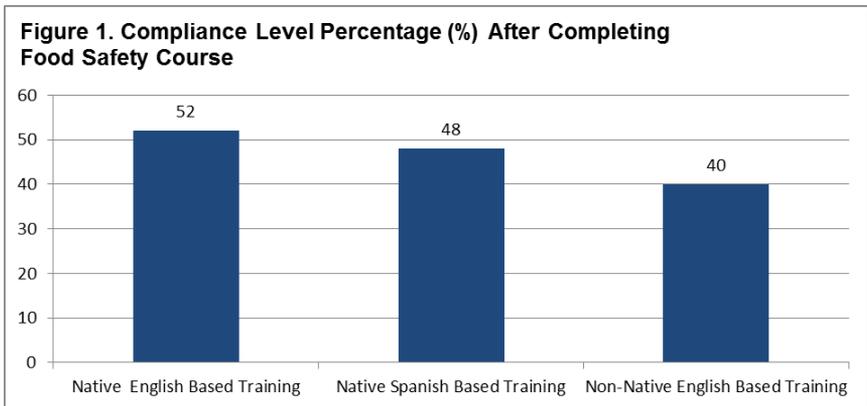
A sample of 150 FSEs was chosen among the 4,700 regulated FSEs in Suffolk County. The sample was limited to those FSEs that employed at least one person with a valid food manager's certificate and which were inspected by standardized sanitarians (who are accredited by the New York State Department of Health with the title of Food Service Inspection Officer Level-1 [FSIO-1]). Sanitarians in Suffolk County enforce Article 13 of the Suffolk County Sanitary Code. Results of inspection reports before and after a food service worker completed the Food Manager's Course were examined. Establishments were separated into three groups, depending on how their certified food manager completed the course: Group 1 was comprised of native English speakers who completed the course in English; Group 2 consisted of native Spanish speakers who completed the course in Spanish; and Group 3 was comprised of native Chinese speakers who completed the course in English.

A secondary qualitative analysis was conducted by interviewing seven FSIO-1 sanitarians. The interviews provided information about the different methods used by inspectors to communicate with food service workers during routine inspections when the inspector and the worker do not speak a common language. Sanitarians were asked questions regarding the frequency of dealing with language barriers, different methods

used to communicate during inspections, and their opinions regarding overall interactions with establishment employees and owners/operators.

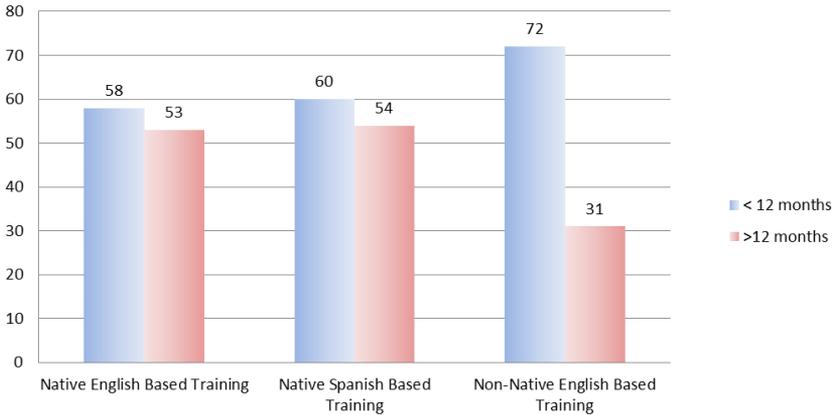
## Results

Compliance levels improved more for Spanish language-speaking FSE workers taking the course in Spanish (Group 2) and English language-speaking FSE workers (Group 1) as compared with FSE workers who took the course in English rather than in their native language (Group 3). Out of the 50 FSEs in which English was the primary language spoken, 26 respondents, or 52%, were cited for fewer critical violations after at least one food service worker completed the Food Manager’s Course (See Figure 1). This trend continued in FSEs where Spanish was the native language spoken by the food service workers, as 24 respondents out of 50, or 48%, were cited for fewer critical violations. In the establishments where Chinese was the predominately native spoken language and the food service worker completed the English-based Food Manager’s Course, the compliance level was found to be 40%, with 20 out of the 50 FSEs cited for fewer critical violations (See Figure 1).



Interviews with FSIO-1 certified sanitarians indicated that native language-based education is an important factor when attempting to increase compliance within a food service establishment. However, a theme noted throughout the interviews was that reinforcement of the food safety practices after participation in the Food Manager’s Course was critical for successfully maintaining compliance with food safety practices over time. Interviewees strongly believed that compliance is greatly influenced by timely reinforcement of learned behaviors. When an inspection was conducted *within 12 months of course completion*, the same number or fewer critical violations were cited for 58% of FSEs that completed native English-based training, 60% of FSEs that completed native Spanish-based training, and 72% of FSEs that completed non-native English-based training. When an inspection was conducted *more than 12 months after course completion*, these results dropped to 53% in Group 1, 54% in Group 2 and 31% in Group 3 (See Figure 2).

**Figure 2. Time-Based Compliance Level Percentage (%) After Education Provided**



Survey results from FSIO-1 sanitarians also revealed that communication during an inspection is often non-verbal when language is a barrier. All sanitarians indicated that they commonly rely on performing a series of actions to convey a message, as this technique proves more effective when faced with a language barrier. The technique used most frequently by sanitarians is a method by which they “act out” the violation using hand gestures or create drawings in order to communicate the violation observed and the subsequent corrective action required.

Using widely-available translation programs installed on cell phones or computers to convey key words or actions was identified as a common form of communication, as well. However, sanitarians explained that these programs often confuse the food service worker, as common phrases are often translated literally and do not correlate with the spirit of the phrase. While these on-the-spot tactics may be effective at correcting a violation when observed, the tactics, according to the sanitarians surveyed, are not conducive to achieving long-term compliance.

### **Conclusions**

Native language-based food safety education results in higher levels of food safety compliance (as seen in Figure 1). As observed in Figure 2, there was a stronger correlation in long-term compliance levels among Groups 1 and 2, where native language-based education was provided, when compared to Group 3, where education was not provided in the food service worker’s native language.

This conclusion is qualified by several limitations. First, the samples are relatively small. Second, compliance was measured simply by the number of critical violations rather than the types of critical violations. Third, Group 2 consisted of Spanish-speakers, while Group 3 was comprised of Chinese-speakers. This research might be improved if the native language of both Group 2 and Group 3 were the same.

## Recommendations

1. Suffolk County should continue to offer food safety education in multiple languages as necessary, and compile and review data on an ongoing basis in order to evaluate and improve the effectiveness of the training provided.
2. Suffolk County should explore new ways to reinforce habits and behaviors learned during food safety training as a method of increasing long-term compliance.
3. Suffolk County should continue to improve the cultural competency of inspecting sanitarians so that guidance, education, and recommendations given during inspections will have a greater impact on achieving long-term compliance.
4. Suffolk County should continue to utilize and expand on the use of translation services to reduce the possibility of miscommunication due to language during the inspection process.

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# Factors Influencing Multi-Jurisdictional Collaboration Within State Food Emergency Rapid Response Teams (RRTs)

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## Abstract

National Rapid Response Team (RRT) best-practices have yet to identify factors that influence multi-jurisdictional collaboration within these teams. A study was carried out using interviews with each RRT. Thematic analysis identified common themes related to collaboration success, barriers, and strategies. Study results included findings of increased partner familiarity, increased awareness of RRT capabilities, and institutionalization of collaboration into agency culture as common success themes. Common barriers included perception of turf, restricted information sharing, and lack of dedicated RRT personnel. Common strategies included persistent communication, building personal relationships, dedicated RRT personnel, and leadership buy-in. In conclusion, when considered together, these factors may build upon existing best-practices to assist teams in increasing collaboration successes. Study recommendations included the need to maintain persistent communication in order to institutionalize collaboration; meet face-to-face to build personal relationships and understand capabilities/limitations; establish dedicated RRT personnel; carry out an equal partnership in sharing information; and obtain leadership buy-in for collaboration by marketing capabilities of the multi-jurisdictional team.

*Keywords:* multi-jurisdictional, collaboration, Rapid Response Team, institutionalization, organizational culture.

## Background

Rapid Response Teams (RRTs) have been commonly used in the emergency medical (Devita et al. 2006) and disaster/humanitarian (UNDAC, 2014) settings. However, RRTs are relatively new to the regulatory food safety arena. The Food Protection RRT Program was created in 2008 as a United States Food and Drug Administration (FDA) initiative to partner with state food/feed safety regulatory agencies for building emergency response capacity within an integrated food safety system (FDA Rapid Response Teams, 2014). The program currently consists of 18 teams housed in state regulatory agencies. Teams carry out all-hazards responses that include a wide array of food/feed emergencies and are encouraged to share resources, knowledge, and lessons-learned guidance among their public health partners to expedite control and mitigation of food/feed-related incidents.

These responses require the participation of multiple agencies and stakeholders due, in part, to jurisdictional requirements, areas of expertise, and resource needs. Collaboration between participating agencies is essential during a response and has often relied on institutional knowledge housed within those agencies to be effective.

Joint guidance documents created by the RRTs and the FDA Office of Partnerships (FDA OP) provide a solid foundation on which to base collaboration efforts; however, specific strategies implemented by RRTs have yet to be captured. Furthermore, each state was granted an appropriately wide berth to promote the development of its RRT with

respect to its unique operational and jurisdictional framework. Due to these factors, current literature and cross-sectional lessons-learned guidance is limited in terms of identifying factors that influence multi-jurisdictional collaboration efforts within the RRTs.

### **Problem Statement**

There is limited information on a national level that characterizes successes, barriers, and strategies pertaining to multi-jurisdictional collaboration for current RRTs functioning in diverse operational and jurisdictional frameworks.

### **Research Question**

In order to characterize factors influencing collaboration efforts in the current 18 RRTs, this study was designed to address the following:

1. What multi-jurisdictional collaboration successes have the current RRTs experienced?
2. What collaboration barriers have the current RRTs experienced?
3. What strategies were implemented to address and resolve the identified barriers to multi-jurisdictional collaboration?

### **Methodology**

The author obtained information from 18 existing RRTs by means of telephone interviews and an informal feedback group conducted after a majority of the interviews were completed. Study participants were identified through the national RRT Program directory maintained by FDA OP. A web-based interest survey was emailed to each of the identified RRT representatives. The survey provided the opportunity for each RRT Program Director/Manager to identify another individual within the same agency who may have had greater experience with their team's multi-jurisdictional collaboration efforts.

A total of 18 telephone interviews using a semi-structured questionnaire were conducted from October 2014 to January 2015. Interview questions captured general descriptive data for each RRT, as well as data pertaining to that team's experience with multi-jurisdictional collaboration such as successes, barriers, and strategies. The interviews were recorded and transcribed. Theoretical thematic analysis was manually conducted on the transcriptions to code the interview data and identify common themes (Braun and Clarke, 2006). Common themes were stratified based on identified successes, barriers, and strategies to address barriers.

### **Results**

Eighteen total interviews were completed—nine from RRTs created in 2008/2009 ("Original" RRTs) and nine from RRTs created in 2012 ("New" RRTs). RRTs were equally housed in their respective state's Departments of Health or Agriculture. Thirty-three percent (N=6) indicated a centralized local health jurisdiction structure (local health units led by state and state retains authority [ASTHO, 2012]), while 61 percent (N=11) indicated a decentralized structure (local health units led by local employees and local governments retain authority [ASTHO, 2012]). One RRT did not specify its state's local health structure.

Initial review of the data set revealed several commonalities between the RRTs related to collaboration successes, barriers, and strategies. Subsequent thematic analysis revealed common themes related to collaboration among both original and new RRTs.

### **Success Themes**

Analysis revealed more effective and frequent communication between response partners as a common theme among both original and new RRTs. Identified successes related to this enhanced communication included a heightened sense of familiarity and increased awareness surrounding the RRT's capabilities and its role in coordinated food/feed-related emergency responses.

*I think one of the things that has been very valuable is that we meet on a quarterly basis so the players know each other. The members of the RRT understand what each group brings to the table, their abilities and their capabilities. We've also developed an updated contact list so that we're able to reach out more easily. We've built this working relationship where you understand who you're reaching out to, who to reach out to, and they are much more receptive because they understand who's calling. -----Interviewee 006*

Another common success theme was the institutionalization of routine communication between state partners, between the state and their FDA District Office, and between RRTs. Many teams described how frequent communication has become part of their agency's "culture," in that the increased level of communication and collaboration with response partners is no longer just encouraged, but expected.

*...that structure involves bi-weekly meetings with [FDA District Office] and the regional FDA Emergency Response Coordinators (ERCs) to give updates on what we're doing, how we're doing it, what we need to do, what we need to plan for... they've become just an extended family, an extended workgroup. If we don't talk with them we feel like we're missing out on something and we usually are. So it's become more of a working relationship and I think communication is critical. Even when we bring in a new ERC from the district, it's engrained into that district that you will communicate with the state, you will work together, and it's to the benefit of both agencies. -Interviewee 005*

Co-location of response partners was also identified as a common aspect of successful multi-jurisdictional collaboration. RRTs that had the ability to easily communicate face-to-face with response partners identified this in-person communication as a success either because they were physically housed in the same building or because they held routine face-to-face meetings.

*...the face-to-face meetings I think are really important because you get to know people and build relationships so you feel comfortable picking up the phone and talking to them.... -Interviewee 009*

Despite the multi-jurisdictional collaboration successes identified by the RRTs to date, barriers to success do remain.

## **Success Barriers**

One commonly-identified barrier to multi-jurisdictional collaboration pertained to the perception of “turf” or territory, where a jurisdiction assumes an RRT is going to seize absolute command of a response. “Turf” was also used to describe an unwillingness of some jurisdictions to relinquish a sense of control over an emergency response when multiple agencies are participating or when an RRT is being used to coordinate activities.

*...it’s rough letting go. You have to be able to let go enough to trust that the relationship is going to work so we can build the bridge in the first place. So you do include those people in various groups. You give them a say, you go out and reach out to them. And it’s really been amazing the results people have seen from that. -Interviewee 003*

An additional barrier pertained to restrictions in information sharing between federal, state, and local response partners. Respondents emphasized the perception among state responders that, at times, they do not feel they are considered equal collaborators by their federal counterparts, despite holding valid commissions or operating under a confidentiality agreement in accordance with 21 Code of Federal Regulations (CFR) section 20.88.

*...there still seems to be some lagging hesitancy to accept or recognize that we have to be equal partners. There is still some information that doesn’t necessarily make its way to us as a state agency.... -Interviewee 017*

A lack of dedicated RRT personnel was also identified as a barrier to successful multi-jurisdictional collaboration. Dedicated RRT coordinator positions were often reported to serve as familiar liaisons between the different jurisdictions in order to establish and maintain relationships.

*It’s essential that you have someone who is focused on being able to make that their task, rather than another job responsibility in a very full schedule. I’m really concerned. I think things have gone really well...but we need dedicated staff and funding to have this progression continue to support our RRT on an ongoing basis -Interviewee 006*

Despite continuing challenges to successful collaboration, the RRTs implemented strategies to overcome some of the barriers identified.

## **Barrier Reduction Strategies**

One common strategy that RRTs have implemented to reduce collaboration barriers is persistence in approaching routine communication with partner jurisdictions. Frequent and structured communication, whether in the form of weekly conference calls or routine face-to-face meetings, tended to serve as a precursor to institutionalizing collaboration into the participating jurisdictions’ organizational “culture” or routine operational environment.

*It’s strange but it has become the culture...you work with FDA, it’s just what you do, why wouldn’t you? They can help you in some circumstances and in others we can help them. -Interviewee 005*

In-person meetings were reported to more quickly increase familiarity among partners through the establishment of personal relationships.

*We do have face-to-face meetings three times a year. We always had them in [state omitted] because we started out just being with the mentor state, but it progressed into all three of the states in the district getting together. At the meeting everybody gets to hear what's going on, lots of good conversation. Questions about how this happened, how's this going along, how'd you do this. Again, it's very open to everyone, just very willing to share information, how they got something to work, things like that.*

*-Interviewee 013*

These face-to-face meetings were also reported to enhance understanding about each jurisdiction's capabilities and limitations, which helped to better define advantages that the multi-jurisdictional RRT structure can bring to a food/feed-related response.

*Yeah, once people have begun to see what we can deliver and how we do it and basically how we are an advantage to them for carrying out some of their activities, everything begins to come together....* -Interviewee 014

An additional strategy implemented by RRTs has been establishing dedicated RRT personnel positions that work exclusively on RRT development activities, including serving as a familiar liaison to build relationships between jurisdictions.

*I would say having an individual to serve as a liaison to build those relationships and to communicate as a liaison to the different agencies and jurisdictions. It's primarily the RRT Program Manager or Assistant Program Manager.* -Interviewee 008

Top-down leadership buy-in was also identified as a common strategy. Leadership endorsement was reported to assist in adopting collaboration activities into that particular jurisdiction's culture. Respondents indicated leadership buy-in has been obtained through conscious marketing of the RRT's capabilities as an effective multi-jurisdictional public health response team.

*I think it comes from the leadership from all of the organizations. If the leadership has the buy-in and staff down below see that the leadership is saying that this is our process, we worked hard to coordinate this, and we want to continue this process and this is our expectation...I think that's a win.* -Interviewee 010

### **Five Factors for Successful Collaboration**

The common collaboration themes identified by the RRTs were further categorized into five generalized factors: familiarity, relationships, culture, communication, and resources.

These factors, when considered together, may be able to build on existing best-practice guidance to assist multi-jurisdictional teams in increasing their collaboration successes. Familiarity generalizes themes related to both personal familiarity between jurisdictional representatives, as well as familiarity of each jurisdiction's capabilities and limitations when responding to a food/feed incident. The relationship factor refers to themes related to building personal relationships. The culture factor generalizes themes related to institutionalizing collaboration into a jurisdiction's operational environment,

as well as leadership buy-in and how it affects collaboration. Communication captures common themes related to routine activities, such as frequent face-to-face meetings, regular conference calls, joint trainings, etc. The resource factor refers to dedicating and maintaining necessary resources to support successful collaboration, including dedicated personnel and funding.

### **Conclusions**

Interview data provided by the 18 RRTs provided several common themes associated with successes, barriers, and strategies related to multi-jurisdictional collaboration. Despite varied operational environments, shared ideas were identified related to increased familiarity, relationship-building, agency culture, persistent communication, and the allocation of adequate resources in order to maintain collaborative efforts. When considered together, these factors may assist multi-jurisdictional teams in enhancing their capacity to successfully collaborate with public health partners within an integrated food safety system.

### **Recommendations**

While this project identified several common themes related to multi-jurisdictional collaboration successes, barriers, and strategies among existing RRTs, only perspectives from state representatives were captured. Additional data collection from federal and local representatives is recommended in order to identify additional best-practices from those perspectives. Based on the common themes identified in this project, the following best-practice recommendations can be made:

1. Maintain persistent communication with response partners in other jurisdictions in order to institutionalize collaboration efforts into agency culture. This could be accomplished through regularly-scheduled phone calls, webinars, face-to-face meetings, joint training opportunities, etc.
2. Meet face-to-face prior to an emergency to increase familiarity among responders, build personal relationships, and increase mutual awareness around each jurisdiction's capabilities and limitations.
3. Establish permanent, dedicated RRT personnel who are able to work exclusively on team development and serve as a familiar liaison to response partners.
4. Work to obtain high-level leadership buy-in for collaboration efforts by marketing the multi-jurisdictional response capabilities of the RRT. Robust support from upper management increases the likelihood of having integrating collaboration into agency culture, which may assist in maintaining collaborative activities through changes in personnel, funding, etc.

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