

A Review of 2022 and a Look Forward to 2022

As the Foundation looks forward to 2023, a brief review of the work of the Foundation shows a commitment to the Foundation's mission to conduct research and disseminate information that drives continuous improvement in the meat and poultry industry. The Foundation continues work that will enable meat and poultry companies to exceed expectations in key areas like food safety, nutrition, animal welfare and sustainability. In 2022, the Foundation undertook an ambitious research agenda implementing seven research projects and more than doubling the research value of the Foundation's investment.

Funded by the Beef Checkoff and Foundation

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Funded by the Foundation and National Pork Checkoff

- Leveraging a current market hog lymph node study to further understand *Salmonella* transmission and internal colonization
- Development and validation of an antimicrobial database to predict microbial load reduction on raw pork components against *Salmonella*
- Exploring the use of ProbiCon as a direct-fed microbial to reduce the *Salmonella* burden in market hogs

Funded by the Beef Checkoff and Administered by the Foundation

- Impact of sanitization and natural biofilm communities on *Salmonella* prevalence at processing plants
- Novel TaqMan assays for the specific detection and simultaneous differentiation of virulent and avirulent non-O157 Shiga toxin-producing *Escherichia coli* strains

Funded by the Foundation

- Effects of helium gas utilization in modified atmosphere packaging (MAP) on beef quality

To further advance the scientific knowledge, in July the Foundation issued its three concurrent requests for proposals (RFP) on key topics in food safety, nutritional sciences and product quality. Additional requests for proposals were issued on beef safety and African swine fever. The proposals submitted in response to the RFPs were reviewed by the Foundation's Research Advisory Committee. Select projects were recommended for funding and evaluated by the Foundation's Board of Directors in January 2023. Several projects addressing meat and poultry safety, nutrition sciences and product quality were approved for funding. More detailed information on the projects will be provided in the April 2023 *Foundation Focus*.

First Meeting of 2025 DGAC and Request for Comments

The [first meeting of the 2025 Dietary Guidelines Advisory Committee will be held February 9-10, 2023](#). The [20 committee members](#) were announced on January 19 and it is expected they will meet six times to review the evidence and discuss recommendations. Specifically, the Committee will examine evidence on the scientific questions, using approaches including systematic reviews, food pattern modeling, and data analysis. The Committee will then develop a scientific report to be submitted to the HHS and USDA Secretaries. The scientific report should describe the Committee's review and conclusions and provide science-based advice and rationale to the Departments based on the preponderance of evidence reviewed. HHS and USDA will consider the Committee's scientific report as they develop the *Dietary Guidelines for Americans, 2025-2030*.

The purpose of the first meeting is to orient the Committee to the *Dietary Guidelines* process and mark the beginning of its work. The first meeting agenda will include (a) review of operations for the Committee members, (b) overview of the proposed scientific questions identified by the Departments to be examined by the Committee, (c) presentations on the evidence-based approaches for reviewing the scientific evidence, and (d) plans for future Committee work. The meeting will be held virtually and is open to the public. To register, go to www.DietaryGuidelines.gov and click on the link for "Meeting Registration." Online registration is open until February 10, 2023.

Written comments from the public will be accepted throughout the Committee's deliberative process for the next approximately two years. Opportunities to present oral comments to the Committee will be provided at a future meeting.

It is expected that the role of meat in healthy dietary patterns as well as health outcomes related to ultra-processed foods will be important discussions with the Committee.

Consumer Food Safety Education Conference

The Beef Checkoff, through its contract with the Foundation, will sponsor the Partnership for Food Safety Education's Consumer Food Safety Education Conference on March 1-3, 2023 in Arlington, VA. This conference supports food safety educators in their work to communicate the science of food safety to consumers. As a sponsor, the Beef Checkoff will be provided an opportunity to share post-harvest beef safety research conducted on behalf of the Beef Checkoff and engage with attendees directly. Additional information is available at <https://cfsec.org/>.



IFSAC Issues Report on Foodborne Illness Source Attribution Estimates for 2020

The [Interagency Food Safety Analytics Collaboration \(IFSAC\)](#) includes the Centers for Disease Control and Prevention (CDC), the U.S. Food and Drug Administration (FDA), and the U.S. Department of Agriculture's Food Safety and Inspection Service (USDA-FSIS). Each year, IFSAC estimates the percentages of foodborne illness attributed to certain sources using outbreak data from 1998 through the most recent year for IFSAC's priority pathogens: *Salmonella*, *Escherichia coli* O157, *Listeria monocytogenes*, and *Campylobacter*.

The most recent Annual Report for 2020 data was issued in November:

[Foodborne illness source attribution estimates for 2020 for Salmonella, Escherichia coli O157, and Listeria monocytogenes using multi-year outbreak surveillance data, United States](#)

However, *Campylobacter* was not included in the report for 2020. IFSCA explains this by saying, "Unlike in prior IFSAC Annual Reports, attribution estimates for *Campylobacter* are not presented in this year's report. Evidence suggests the sources of *Campylobacter* outbreaks likely differ considerably from the sources of non-outbreak-associated illnesses caused by this pathogen. IFSAC is exploring alternative approaches for estimating the sources of *Campylobacter* illnesses."

Other key findings include:

- *Salmonella* illnesses came from a wide variety of foods. More than 75% of *Salmonella* illnesses were attributed to seven food categories: Chicken, Fruits, Pork, Seeded Vegetables (such as tomatoes), Other Produce (such as fungi, herbs, nuts, and root vegetables), Beef, and Turkey.
- *E. coli* O157 illnesses were most often linked to Vegetable Row Crops (such as leafy greens) and Beef. More than 80% of illnesses were linked to these two categories.
- *Listeria monocytogenes* illnesses were most often linked to Dairy products, Fruits, and Vegetable Row Crops. More than 75% of illnesses were attributed to these three categories, but the rarity of *Listeria monocytogenes* outbreaks makes these estimates less reliable than those for other pathogens.

THANK YOU TO THE FOUNDATION'S 2022 CONTRIBUTORS

The Foundation is supported through generous contribution of companies and individuals. Company names with an asterisks (*) indicate NAMI Board of Directors companies. 2023 fundraising efforts are now underway.

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FOUNDATION EDUCATION SCHEDULE

Annual Meat Conference

March 6 - 8, 2023
Dallas, TX

Environment, Labor and Safety Conference

April 18 - 20, 2023

Animal Care and Handling Conference

May 25 - 26, 2023
Kansas City, MO

[Click here](#) to learn more about these events, or visit www.meatinstitute.org and click the Events tab on the navigation bar.

2023 RESEARCH ADVISORY COMMITTEE MEMBERS

The Foundation's Research Advisory Committee (RAC) develops meat and poultry research priorities which serve as the basis for the Foundation's research agenda and also communicates the areas of greatest research needs to the government, public and interested stakeholders. The RAC is made up of four subgroups across minimally processed (fresh) meat and poultry safety, further processed meat and poultry safety, nutrition sciences and product quality.

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Melissa Bonorden, Hormel Foods Corporation
Ted Brown, Cargill, Inc.
Zach Cameron, Tyson Foods, Inc.
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Ben Stellmacher, Johnsonville Sausage, LLC
Tommy Wheeler, USDA, ARS, U.S. Meat Animal Research Center
Barry Wiseman, Triumph Foods

2023 BOARD OF DIRECTORS

The Foundation for Meat and Poultry Research and Education is governed by a Board of Directors, which provides scientific leadership and financial oversight, and acts upon recommendations from the Foundation's Research Advisory Committee. The North American Meat Institute's Executive Board is afforded the opportunity to serve on the Foundation's Board of Directors or appoint a designee to serve on their behalf. In an effort to broaden the scope of influence and direction, representatives from the livestock (beef, pork, poultry and egg), retail, academic, government agency and consumer sectors, among others, are invited to serve on the Board of Directors. Terms are for one year.

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Leveraging a current market hog lymph node study to further understand *Salmonella* transmission and internal colonization

Kansas State University, Texas Tech University, Triumph Foods

This project will probe a possible relationship between *Salmonella* antibodies in oral fluids and internal colonization of market hog carcasses by determining if antibody testing of oral fluids can be used as an effective antemortem screening tool to assess a group/lot of pigs for *Salmonella* risk. Further, it will characterize internal colonization within market hogs by detecting and enumerating *Salmonella* in lymph nodes and tonsils, cecal contents, spleen, and oral fluids.

Research funded in part by the National Pork Checkoff.



Development and validation of an antimicrobial database to predict microbial load reduction on raw pork components against *Salmonella*

University of Illinois at Urbana-Champaign

This study will implement a high-throughput miniature assay to evaluate *Salmonella* reduction after pork carcass wash with antimicrobial treatments. Response surface methodology will be used to determine synergistic or antagonistic interactions between antimicrobials and optimize combinations to reach desired *Salmonella* reductions. The results are intended to validate the predicted interactions between antimicrobials in laboratory experiments, as well as build an antimicrobial database in which additional antimicrobial treatments data can be added as new compounds become relevant against *Salmonella* in pork.

Research funded in part by the National Pork Checkoff.



Exploring the use of ProbiCon as a direct-fed microbial to reduce the *Salmonella* burden in market hogs

Kansas State University, USDA-ARS-U.S. Meat Animal Research Center, Triumph Foods

This study will evaluate the influence of direct fed microbials (DFM) on pig performance, morbidity, and mortality throughout the feeding period. The feces and mesenteric lymph nodes of market hogs fed a control or DFM augmented diet will be collected to establish the impact of each diet on *Salmonella* internalized in the lymphatic system. By determining *Salmonella* serotype and presence of highly pathogenic *Salmonella* (HPS), it evaluates whether *Salmonella* diversity and/or presence of HPS is impacted by probiotic administration.

Research funded in part by the National Pork Checkoff.



Dietary modeling the nutritional impact of removing/adding/substituting meat and poultry servings to the healthy dietary patterns

Nutrition Impact LLC, NutriScience LLC

This project will model the effect of removing or adding a serving of minimally processed and further processed meat and poultry or substituting a serving of various foods with a serving of minimally processed and further processed meat and poultry on nutrient profiles in the healthy dietary patterns identified in the Dietary Guidelines for Americans, 2020-2025.

Research funded in part by the Beef Checkoff.



Effects of helium gas utilization in Modified Atmosphere Packaging (MAP) on beef quality

Texas A&M AgriLife

This project will determine if the inclusion of various levels of helium gas in modified atmosphere packaging (MAP) impacts color shelf-life or microbiological reductions on steaks surfaces.



A Cross-Sectional Investigation of *Salmonella* in Market Hog Lymph Nodes

Kansas State University, Texas Tech University, Triumph Foods, LLC, Smithfield Foods, Inc., JBS Foods, Clemens Food Group

A cross-sectional study design will investigate the prevalence and concentration of *Salmonella* in up to 6 lymph nodes and tonsils of market hogs. Prevalence and concentration data will be subsequently used to design a risk-assessment mapping of the carcass for prioritization of node-removal for pathogen control. The study also intends to address knowledge gaps regarding *Salmonella* prevalence by region and/or season in the United States.

Funded in part by the National Pork Checkoff.



Effects of proportioning meat and plant-based protein-rich foods within the U.S. Healthy Eating Pattern on cardiovascular disease risk factors

Purdue University

This project will assess the effects of consuming different proportions of red meat and plant-based, protein-rich foods incorporated into a U.S. Healthy Eating Pattern on cardiovascular disease risk factors in adults at high risk of developing a heart-related disease.

Research funded in part by the Beef Checkoff.

Tests of *Salmonella* Sub-unit Proteins as Vaccines for Broiler Chickens

USDA-ARS U.S. National Poultry Research Center

This project will identify the *Salmonella* protein antigens able to induce humoral immune response in broilers, and consequently these antibodies can prevent *Salmonella* colonization in the broiler gastrointestinal tracts.

Novel TaqMan assays for the specific detection and simultaneous differentiation of virulent and avirulent non-O157 Shiga toxin-producing *Escherichia coli* strains

Florida State University, USDA-ARS, U.S. Meat Animal Research Center

This study intends to standardize six multiplex TaqMan assays for the identification of virulent strains of *E. coli* O26, O111, O45, O103, O121, and O145 serogroups. Further, it will demonstrate the applicability of the standardized assays in inoculated food samples and red meat enrichments from national red meat surveillance programs through a direct comparison with the FSIS MLG 5C.01 reference method.

Impact of sanitization and natural biofilm communities on *Salmonella* prevalence at processing plants

USDA-ARS, U.S. Meat Animal Research Center

This study will evaluate the efficacy of commercial sanitizers against *Salmonella* harbored within environmental mixed biofilms by measuring biofilm forming ability and community structure of environmental biofilms before and after sanitization. It will compare environmental microbial communities and *Salmonella* survival in mixed biofilms before and after sanitization to determine the impact of different sanitizers on controlling *Salmonella*.

Using empirical evidence, modeling, and risk assessment methods to estimate the public health impact of incorporating enumeration and virulence as part of the criteria for evaluation of *Salmonella* contamination in ground beef in the US

EpiX Analytics, Colorado State University

This project will develop a quantitative microbial risk assessment to assess the potential public health impact of incorporating enumeration and virulence evaluation strategies as part of the criteria for evaluation of *Salmonella* contamination in ground beef in the U.S. Additionally, using existing surveillance data the effect of season and regional sources of the live cattle on changes in *Salmonella* prevalence, virulence, and enumeration in ground beef and trim will be estimated.

Risk assessment model to assess the impact on public health of pork based on the contamination level and presence of highly virulent or multidrug resistant strains

University of Minnesota

This project will build upon a risk assessment model developed using existing FSIS prevalence and enumeration data to assess the impact of raw pork characterized by contamination level and presence of highly virulent or multidrug resistant strains on public health. Results of this model could evaluate potential impact on public health of model performance standards based on *Salmonella* spp. enumeration level and strain characteristics to reduce the number of human cases due to pork consumption.