

FOUNDATION FOCUS



FOUNDATION LOOKING AHEAD TO 2020

In 2019, the Foundation undertook a comprehensive research agenda by conducting two requests for proposals (RFP). In January, the Foundation Board of Directors approved three research projects to address these research priorities.

- How Does Analytic Approach Impact Pathogen Population Structure When Analyzing Whole Genome Sequence Data?, University of Minnesota, IBM
- Effects of Red Meat Consumption on Gut Microbiota in Young Adults, Purdue University, University of Colorado
- Meat as a First Solid Food on Risk of Overweight and Neurodevelopment in Infants, University of Colorado Anschutz Medical Campus, University of Colorado Denver

Signifying the importance of this research, these projects are jointly funded by the Beef Checkoff and the Foundation.

A key component to research is disseminating information to stakeholders and interested parties. In 2018, the Foundation along with U.S. Poultry and Egg Association, Beef Industry Food Safety Council (BIFSCo), and the Beef Checkoff funded three critical projects addressing data gaps in revised Appendices A&B to ensure producers of ready-to-eat meat and poultry products meet these guidelines. These projects ran in parallel to the Appendices A&B Scientific Working Group, who along with the Industry Advisory Group and association partners who were able to share the research findings with the Food Safety and Inspection Service in 2019 to add to the scientific body of evidence and inform the agency's future revisions to the Appendices. The Foundation's research program is having a direct impact on the industry's ability to produce products safely and in compliance with regulatory guidance.

To further advance the scientific knowledge, in August the Foundation issued its annual RFP on key topics in food safety, nutritional sciences and product quality in its request. In 2019, the Foundation funded nutrition sciences research for the first time. The outcomes of these projects will be used to inform the scientific base for future editions of the Dietary Guidelines for Americans. Funding nutrition sciences research is a critical step to ensuring animal products continue to be recognized as an important part of healthy, balanced dietary patterns.

Therefore, a supplemental nutrition sciences RFP was issued to address relevant questions on the role of meat and poultry products in healthy dietary patterns. The proposals submitted in response to the supplemental RFP were reviewed by the Foundation's Research Advisory Committee alongside the proposals in response to the annual RFP. Several projects were recommended for funding and will be evaluated by the Foundation's Board of Directors in January 2020.

RECENT RESEARCH FINDINGS

Research on the Bactericidal Effects of Phenyllactic Acid on *Salmonella* and STEC on Beef Published

Research funded by the Beef Checkoff and administered by the Foundation was recently published in the *Journal of Food Protection*. The abstract follows:

Bactericidal effects of various concentrations of phenyllactic acid on Shiga toxin-producing *Escherichia coli* (STEC), including *E. coli* O157:H7, O26:H11, O103:H2, and O121:H19, and on *Salmonella* Typhimurium DT104 in pure culture and microplates assays were studied. Beef cuts were surface sprayed with phenyllactic acid or lactic acid for inactivation of *E. coli* O157:H7 and *Salmonella* Typhimurium. The 1.5% phenyllactic acid inactivated all inoculated *E. coli* O157:H7, O26:H11, O103:H2, and O121:H19 and *Salmonella* Typhimurium DT104 (.6-log reduction) within 1 min of contact at 218C, whereas 1.5% lactic acid did not result in microbial reduction. Microplate assays (for STEC and *Salmonella* Typhimurium DT104 at 10 to 100 CFU per well) indicated that concentrations of 0.25% phenyllactic acid or 0.25% lactic acid inhibited the growth of STEC and *Salmonella* Typhimurium DT104 incubated at 378C for 24 h. Treatment of beef with 1.5% lactic acid or 1.5% phenyllactic acid reduced *E. coli* O157:H7 by 0.22 and 0.38 log CFU/cm², respectively, within 5 min and reduced *Salmonella* Typhimurium DT104 by 0.12 and 0.86 log CFU/cm², respectively. When meat treated with 1.5% phenyllactic acid was frozen at -208C, inactivation of *E. coli* O157 and *Salmonella* Typhimurium DT104 was enhanced by 1.06 and 1.46 log CFU/cm², respectively. Thus, treatment of beef with 1.5% phenyllactic acid significantly reduced the population of *E. coli* O157:H7 and *Salmonella*.

Zheng R, Zhao T, Hung YC and Adhikari K. Evaluation of Bactericidal Effects of Phenyllactic Acid on *Escherichia coli* O157:H7 and *Salmonella* Typhimurium on Beef Meat. *Journal of Food Protection*, 82, 12, 2016–2022. <https://doi.org/10.4315/0362-028X.JFP-19-217>.

A NEW RESEARCH ADVISORY COMMITTEE FOR THE FUTURE

The Foundation's Research Advisory Committee (RAC) sets research priorities and directs research activities subject to approval by the Foundation Board of Directors. The RAC is comprised of scientific leaders in industry, academia, and government who volunteer their time to serve in this critical capacity. For nearly two decades, the RAC has focused on meat and poultry safety research. As we embark on the next decade with an expanded research agenda, the RAC too must be expanded to meet these needs. In 2020, the Research Advisory Committee will be recreated to ensure experts in fresh and processed meat and poultry safety, nutritional sciences, animal production, and product quality are part of subcommittees addressing each of these topic areas. Each subcommittee will meet and identify research priorities in their areas of expertise, which will then be shared across the entire RAC. These priorities will be used to communicate with governmental agencies, interested stakeholders and the general public and are intended to show the broad scope and diverse research needs of the industry. Critical priorities will serve as the basis for the Foundation's Request for Proposals, which are typically released each summer. We look forward to reporting on the new RAC in future newsletters.

2019 RESEARCH ADVISORY COMMITTEE

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Amanda Wojtowicz, US Foods
Diane Wood, Maple Leaf Consumer Foods
Janice Wynn, Harris Ranch Beef Company
Michelle You, Home Market Foods

FIND BEEF SAFETY RESOURCE INFORMATION ON THE WEBSITE

The Foundation recently updated its website to include the Beef Safety Resource (formerly located at Beefsafetyresources.com) on the home page.

Made possible by the Beef Checkoff, the Beef Safety Resource (BSR) is a one-stop source of timely food safety information from federal sources for in-plant food safety operators, managers, academics and interested stakeholders.

Those using the BSR can filter and sort results by date, title and source. Federal sources include the Federal Register and FDA, USDA, and CDC releases, updates and notices.



FOUNDATION EDUCATION PROGRAMS SCHEDULE OF EVENTS

Environmental Conference for the Meat & Poultry Industry

Co-located at the International Production and Processing Expo (IPPE)

January 27-28, 2020

Atlanta, GA

Worker Safety Conference for the Meat & Poultry Industry

Co-located at the International Production and Processing Expo (IPPE)

January 28-29, 2020

Atlanta, GA

Annual Meat Conference

March 2-4, 2020

Nashville, TN

Advanced *Listeria monocytogenes* Intervention and Control

April 22-23, 2020

Kansas City, MO

Meat Industry Food Safety Conference

September 9-10, 2020

Chicago, IL

For more information on these programs, please visit the events page at www.meatinstitute.org.

2020 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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Corporation



CURRENT FOUNDATION RESEARCH PROJECTS

How Does Analytic Approach Impact Pathogen Population Structure When Analyzing Whole Genome Sequence Data?, University of Minnesota, IBM

The overall goal of this project is to support an accurate, reproducible, transparent and uniform approach to whole-genome sequence analysis for purposes of outbreak detection and pathogen surveillance. The overarching objective is to demonstrate how different analytic approaches to whole-genome sequence analysis can impact analysis results.



Research funded in part by the Beef Checkoff.

Effects of Red Meat Consumption on Gut Microbiota in Young Adults, Purdue University, University of Colorado

Gut microbiota are an important contributor to human metabolic health and the impact of animal-based foods, unprocessed and processed red meat in particular requires investigation. Results from a recent study with rats suggest that consuming processed vs. unprocessed red meats may differentially influence gut microbiota profile. This project intends to determine the effect of unprocessed and processed red meat on gut microbiota.



Research funded in part by the Beef Checkoff.

Meat as a First Solid Food on Risk of Overweight and Neurodevelopment in Infants, University of Colorado Anschutz Medical Campus, University of Colorado Denver

Early complementary feeding is a unique and malleable period to prevent rapid weight gain and later obesity, and is also a critical phase for neurodevelopment. Meat is an excellent source of high-quality protein and micronutrients, which are critical for the normal development of older infants. This research will conduct a randomized controlled trial to comprehensively evaluate the effect of meat on growth, body composition, risk of overweight and neurodevelopment, with a protein intake at the reported population median. Findings from this study will be generalizable and help inform future dietary guidance.



Research funded in part by the Beef Checkoff.

Pathogen Growth in Alternatively Cured Ham and Bacon during Cooking, Cooling, and Process Deviations, Iowa State University and Smithfield Foods

The overall goal of the project is to determine the inhibitory effect of nitrite from a natural source (i.e., pre-converted celery juice powder) in processed meat products with a natural label during “real world” cooking and chilling procedures, which often include instances of process deviation, as well as non-continuous cooling.

CURRENT FOUNDATION RESEARCH PROJECTS (CONT.)

Validating Growth Models for *Clostridium perfringens*, *Clostridium botulinum*, and *Bacillus cereus* during Cooling of Uncured Meat and Poultry Products, University of Wisconsin

This project will develop data to determine the validity of the revised Option 2 cooling guidelines for uncured meat products, specifically to determine if Phase 1 cooling (from 120 to 80°F) can be extended from the currently outlined 1 hour limit. Uncured turkey breast meat will be used in the model.

Research funded in part by the Beef Checkoff, Beef Industry Food Safety Council, and the U.S. Poultry and Egg Association.

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 that are able to induce humoral immune response in broilers, and consequently these antibodies can prevent *Salmonella* colonization in the broiler gastrointestinal tracts.

Validation of Post-Harvest Antimicrobial Interventions to Control *Salmonella* on Market Hog Carcass Surfaces and Pork Products, Kansas State University

This study will validate the efficacy of lactic acid, sulfuric acid sodium sulfate, bromine, 180°F water, and peracetic acid as post-harvest interventions against *Salmonella*, as well as the impact on product color attributes, on pork carcasses and trim.

Research Priority Setting Meeting for Certain By-Products

There is limited research on the impact of rendering on foodborne pathogens, particularly with the implementation of the Food Safety Modernization Act. The Foundation will work with allied stakeholders in the rendering, pet food and cosmetic industries throughout North America to assemble a meeting where industry standards can be discussed to better inform future research priorities and projects. There is a dearth of critical parameters for this type of research.



THANK YOU TO THE FOUNDATION'S 2019 CONTRIBUTORS

The Foundation is supported through generous contribution of companies and individuals. Company names with an asterisks indicate NAMI Board of Directors companies participating in the 2019 Chairman's Challenge to achieve 100 percent support from the Board.

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