



2019-2020 Request for Proposals

Dear Interested Parties:

The Foundation for Meat and Poultry Research and Education (Foundation) is a non-profit research, education and information foundation established to study ways the meat and poultry industry can produce better, safer products and operate more efficiently. The Foundation funds a broad range of food safety, worker safety, nutrition and consumer information projects.

The Foundation invites pre-proposals in the research areas of food safety, product quality and nutrition sciences. The research priorities were developed by the [Foundation's Research Advisory Committee](#) (Committee) and represent immediate research needs for Foundation funding. The Committee is comprised of leaders in industry, academia and government who volunteer their time to serve in this critical capacity.

Research pre-proposals will be reviewed by the Committee and selected pre-proposals will be recommended for a more comprehensive proposal. With this in mind, the pre-proposals should be as clear, concise and detailed as possible.

The pre-proposal (excluding the curriculum vitae) should not exceed two (2) pages in length. Pre-proposals should include the following components:

- Investigator(s) Contact Information (including organization, address, city, state, zip, phone, fax, e-mail – not included in page limit);
- The numbered research priority/priorities addressed;
- Project Title;
- Objectives of Research Proposal;
- Description of Research Project;
- Benefit of Research to Industry;
- Approximate Cost of Research;
- Approximate Timetable of Research; and
- Brief Curriculum Vitae (including relevant publications to the proposed research).

The Foundation is requesting that only the application and curriculum vitae be submitted for review at this time. Please refer to the [grant questions and answers document](#) for more detail on pre-proposal submission. The indirect costs policy is available [here](#).

Please submit the pre-proposals via Microsoft Word e-mail attachment to Shannon Green at sgreen@meatinstitute.org by **5 p.m. EDT on Tuesday, August 20**. Pre-proposals submitted after this date and time will not be accepted. An acknowledgement receipt will be sent within one business day. Contact [Susan Backus](#) or [KatieRose McCullough, Ph.D., MPH](#) with any questions.

Food Safety

Evaluate genetic factors that would allow bacterial pathogens (*STEC*, *Salmonella* and/or *Listeria*) or specific pathogen strains to live and thrive in processing environments, on food contact surfaces and/or on products, including in specific niches (*e.g.* areas with high or low temperatures, *etc.*). Research should include how these pathogens survive, assess the virulence phenotypes of these pathogens and if environmental factors have the ability to alter virulence gene expression. Research would likely need to focus on the evaluation of the closed genomes of pathogens using next generation sequencing.

Evaluate mechanisms of horizontal gene transfer in pathogens in different environments. Research should address how horizontal gene transfer can lead to emergence of pathogen strains with increased virulence and/or antibiotic resistance phenotypes. Research should be conducted outside of laboratory benchtop evaluations and in practical environments. Research would likely need to include evaluation of closed microbial genomes.

Identify the combination of virulence factors that cause human illness in pathogenic *Salmonella* and *E. coli*. Research should:

- Determine how virulence could be monitored and biologically prevented.
- Evaluate strains and serotypes that differ in virulence and show distinct virulence phenotypes for their susceptibility to a variety of interventions.
- Identify subsets of *Salmonella* serovars with high and low virulence and estimate the attribution of human illnesses based of virulence level.

Further investigate the microbiome of supershedders. Research should focus on variables that lead or allow animals to become supershedders to pathogens. Research should also address the role that different environmental factors (diet, antibiotic use, *etc.*) have on microbiome.

What factors should you consider when evaluating regulatory whole genome sequenced isolates, *e.g.* type of pathogen; relatedness of sequences; bacterial replication time in different environments; in plant location of pathogen; potential for harborage or continual reintroduction; what can be learned; among other factors.

Identify and validate interventions and novel application methods to reduce pathogen contamination of beef and pork head or cheek meat. If interventions are not approved for use in the U.S., include a plan for obtaining approval in the U.S.

Identify and validate interventions and novel application methods to reduce pathogen contamination of poultry parts. If interventions are not approved for use in the U.S., include a plan for obtaining approval in the U.S.

Identify and validate antimicrobial interventions to reduce pathogen contamination of beef edible variety meats and raw ground beef components intended for use in ground products. Interventions should be approved for use in the U.S. and ideally the major export markets for the specific variety meats.

Investigate efficient and sustainable application of antimicrobials to reduce pathogens on meat and poultry carcasses as well as primals and parts. The proposals should evaluate:

- Water reduction and reuse, specifically efficacy during treatment period;
- Reuse of antimicrobial treatments, specifically efficacy during “lifespan” of reuse treatment, including decay rate of efficacy; and
- Type of application--both existing and novel technology.

Evaluate commonly used antimicrobial interventions at and above current regulatory level of water pick up, e.g. above the 0.49%, to determine if efficacy is improved with usage above the processing aid threshold.

Evaluate the efficacy of interventions during the grinding process to maximize reduction of microbial contamination in ground beef. If interventions are not approved for use in the U.S., include a plan for obtaining approval in the U.S.

Appendix A Research Priorities

Evaluate and validate short-time (less than one hour), high-temperature (above 212°F) cooking processes without relative humidity on the lethality of *Salmonella* in large and small meat and poultry products. 9 CFR 318.17(a)(1) and 381.150 (a)(1)

- Research may be in the form of a challenge study.
- Determine the effect of dehydration on pathogen mortality during impingement cooking processes.
- Further investigate and validate “surface lethality” concept on numerous products to address concern on desiccated *Salmonella*.
- An example of products of concern are marinated and marinated/breaded poultry products (bone-in and boneless). These products are often processed in a continuous cook oven and moisture must be managed to prevent the breading from falling off during cooking.

Evaluate permeability and denaturation of collagen casings during processing with and without relative humidity, including thermal processing, drying and fermentation. For example, a product cooked in a natural casing and then dried.

Appendix B Research Priorities

Evaluate *Clostridium perfringens* growth during cooling in large diameter cured and uncured products beyond 120-80°F range in one hour and 80-55°F in five hours as prescribed under Option 2 in [Appendix B](#). 9 CFR 318.17(a)(2) and 9 CFR 381.150 (a)(2)

- Research should evaluate worse case scenarios during the cooling process while limiting potential growth of *C. perfringens*.
- Determine the effect of antimicrobials on *C. perfringens* and *Bacillus cereus* during chill deviations outside of Option 2 and for large, non-cured items, specifically, cooling from 120°F–80°F in 3–4 hours and 80°F–55°F in 3–4 hours.

Examine the outgrowth of *Clostridium perfringens* growth during cooling in partially cooked or partially heat-treated products. 9 CFR 318.23(c)(1) and 9 CFR 381.150(b)

- Research should focus on cooling times related to outgrowth under conditions as outlined in [Appendix B](#). Investigate which Options outlined in [Appendix B](#) are suitable regarding growth and presence of vegetative cells in these products.

ASF PCR Validation for Meat Products

Evaluate and validate the African swine fever (ASF) PCR as a test for pork to facilitate product exports in the face of an ASF outbreak. Data must be robust enough to support submission to the U.S. Department of Agriculture’s National Animal Health Laboratory Network’s Technical Methods Work Group for methods validation of the PCR for this intended use. The proposal should address the development of sampling protocol(s) for whole muscle, ground, processed and offal products.

Product Quality

Evaluate the ability and reliability of instruments to predict quality traits including tenderness, color stability, flavor, *etc.* Research should focus on muscles other than the *longissimus dorsi*.

Nutritional Sciences

Risk-benefit analysis on the consumption of fresh and processed meat and poultry products as a component of a healthy diet and lifestyle.

- Research may address potential risks or implications associated with eliminating fresh and/or prepared meat products from the diet. This could include nutrition status, water use, environmental implications, among other outcomes.

Current dietary intake and nutrients of public health concern

For each stage of life, the following will be described/evaluated:

- Current dietary patterns and beverage consumption;
- Current intakes of food groups and nutrients;
- Nutrients of public health concern;
- Prevalence of nutrition-related chronic health conditions.

How does dietary intake, particularly dietary patterns, track across life stages from the introduction of foods, into childhood, and through older adulthood?

Dietary patterns

Evaluate the role of meat and poultry in various dietary patterns¹ consumed at each stage of life and:

- 1) Growth, size, body composition, and risk of overweight and obesity;
- 2) Risk of cardiovascular disease;
- 3) Risk of type 2 diabetes;
- 4) Risk of certain types of cancer.

Proposals should include how meat and poultry products fit in dietary patterns. Research may include modeling and other analyses, among other approaches.

Evaluate the role of meat and poultry in various dietary patterns¹ consumed at each stage of life and nutrient adequacy, *e.g.* B12, iron (heme).

What is the relationship between dietary patterns¹ consumed during pregnancy and risk of gestational diabetes?

What is the relationship between dietary patterns¹ consumed during pregnancy and micronutrient status?

What is the relationship between dietary patterns¹ consumed during lactation and human milk composition and quantity?

¹ *Dietary patterns are the quantities, proportion, variety or combination of different foods, drinks and nutrients (when available) in diets, and the frequency with which they are habitually consumed. Examples of dietary patterns are Dietary Guidelines-related, Mediterranean-style, Dietary Approaches to Stop Hypertension (DASH), vegetarian/vegan, low-carbohydrate diets, and high-fat diets. Studies that examine a specific food group, but control for the other aspects of the dietary pattern, will also be considered.*

What is the relationship between dietary patterns¹ consumed during lactation and infant developmental milestones, including neurocognitive development?

What is the relationship between dietary patterns¹ consumed during lactation and post-partum weight loss?

Are changes to the USDA Food Patterns needed based on the relationships identified? If so, how well do USDA Food Pattern variations meet nutrient recommendations *for each stage of life*? If nutrient needs are not met, is there evidence to support supplementation and/or consumption of fortified foods to meet nutrient adequacy?

Types of Dietary Fats

What is the relationship between types of dietary fat consumed at each stage of life and neurocognitive development (birth to 18 years) or neurocognitive health (for those 18 years and older)? Relationships could include developmental milestones.

Complementary foods and beverages

What is the relationship between complementary feeding (timing of introduction, types, and amounts) and micronutrient status?

What is the relationship between complementary feeding (timing of introduction, types, and amounts) and growth, size, and body composition?

What is the relationship between complementary feeding (timing of introduction, types, and amounts) and developmental milestones, including neurocognitive development?

¹ *Dietary patterns are the quantities, proportion, variety or combination of different foods, drinks and nutrients (when available) in diets, and the frequency with which they are habitually consumed. Examples of dietary patterns are Dietary Guidelines-related, Mediterranean-style, Dietary Approaches to Stop Hypertension (DASH), vegetarian/vegan, low-carbohydrate diets, and high-fat diets. Studies that examine a specific food group, but control for the other aspects of the dietary pattern, will also be considered.*