

AUTHORIZATION REQUEST FOR FY 2020

CBB Budget Category: **Research**

Name of Contractor: **Foundation for Meat and Poultry Research and Education**

Name of Organization Subcontracting:

Start Date: **10/1/2019**

End Date: **9/30/2022**

AR OVERVIEW

AR Description:

The strategies and tactics described in this authorization request (AR) support the CBB budget category for research. Detailed descriptions for post-harvest beef safety and processed beef nutrition research and education and outreach are included in the following sections. Around the world, consumers of U.S. beef demand high quality, safe and nutritious products. Beef safety and nutrition research play key roles in the dialogue with domestic and foreign consumers of U.S. beef as their access to protein choices expands and the demand for product information continuously increases. Effective communications must be based in science. Disseminating science-based information and data to diverse audiences is a fundamental role that will be filled through the programs outlined in this AR. Collaborative efforts will be utilized to ensure broad distribution and effective engagement with all stakeholders.

Funding	Direct Costs	Implementation	Total
CBB/BPOC Funding Request:	\$950,00	\$450,000	\$1,400,000

Other Potential Funding	Direct Costs	Implementation	Total
Federation of SBCs Pledges: (Informational Only)	\$0	\$0	\$0
Other Funding: (Informational Only)	\$0	\$0	\$0

Long Range Plan Core Strategies Addressed by this AR (Check all that apply)

Grow Beef Exports	Consumer Trust	Protect & Enhance	Beef's Value Proposition
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Digital properties and target audience(s) addressed by this AR:

www.beefsafetyresource.com, www.meatpoultryfoundation.org, in-plant food safety operators; nutrition scientists; key opinion leaders in food safety and nutrition science.

PROGRAM INFORMATION FOR THIS AR**Tactic A**

Tactic Name: *Post-harvest Beef Safety Research, Knowledge Dissemination and Stakeholder Engagement*

Tactic Description:

Food safety is critical to ensuring consumer confidence in the beef products they choose to buy and feed their families. While current levels of pathogen contamination on beef remain relatively low, there continue to be areas for improvement in its safety profile. Sampling results from the Food Safety and Inspection Service (FSIS) show the prevalence of Shiga toxin-producing *Escherichia coli* (STEC) O157:H7 at 0.24 percent for raw ground beef components and 0.01 percent for ground beef in calendar year (CY) 2018.¹ Comparing the STEC results to 2013, there have been significant decreases of the prevalence of STEC in raw ground beef components and raw ground beef, which were present at 0.82 percent and 0.12 percent, respectively.² However, the prevalence of *Salmonella* spp. for raw ground beef components is 7.35 percent and 3.89 percent in raw ground beef in CY 2018.³ FSIS' "Nationwide Microbiological Baseline Data Collection Program: Beef-Veal Carcass Survey," conducted from August 2014 – December 2015 showed 27 percent of beef carcasses tested positive for *Salmonella* post hide removal.⁴ Contamination of ready-to-eat meat and poultry, which is not broken out by species, by *Listeria monocytogenes* has remained relatively steady at

¹ Sampling Results for FSIS Regulated Products. https://www.fsis.usda.gov/wps/wcm/connect/68f5f6f2-9863-41a5-a5c4-25cc6470c09f/Sampling_Project_Results_Data.pdf?MOD=AJPERES. Accessed June 14, 2019.

² Microbiological Testing Program for *E. coli* O157:H7 and non-O157 Shiga Toxin-Producing *E. coli*: Individual Positive Results for Raw Ground Beef (RGB) and RGB Components. <https://www.fsis.usda.gov/wps/portal/fsis/topics/data-collection-and-reports/microbiology/ec/positive-results-current-cy/2013-ecoli-positives>. Accessed June 14, 2019.

³ Sampling Results for FSIS Regulated Products. https://www.fsis.usda.gov/wps/wcm/connect/68f5f6f2-9863-41a5-a5c4-25cc6470c09f/Sampling_Project_Results_Data.pdf?MOD=AJPERES. Accessed June 14, 2019.

⁴ Nationwide Microbiological Baseline Data Collection Program: Beef-Veal Carcass Survey. <https://www.fsis.usda.gov/wps/wcm/connect/b03963cc-0845-4cfe-b94e-2c955ee5e2ef/Beef-Veal-Carcass-Baseline-Study-Report.pdf?MOD=AJPERES>. Accessed June 14, 2019.

less than one-half of one percent over the last few years.⁵

Research shows that post-harvest, multiple hurdle beef safety interventions and other process controls are effective in reducing the prevalence of pathogenic bacteria. However, the threat posed by pathogens is not static, rather it is constantly emerging and antimicrobial interventions and other process controls must be constantly upgraded to address these emerging threats. Without these continuous improvements, incident levels would have most likely increased. Many of the interventions and process controls now used in the beef industry are the result of checkoff funded research and continued investment is necessary for further improvement.

According to the Centers for Disease Control and Prevention 2018 FoodNet report, *Salmonella* is the second most common source of infection, and the incidence has not declined compared with the previous three years.⁶ The report notes non-O157 STEC illnesses increased by 25 percent when comparing 2018 to 2015-2017 data, while illnesses attributed to STEC O157:H7 decreased 12 percent during the same reference time.⁷ The incidence of illnesses attributed to *Listeria* has remained relatively unchanged for the past several years at 0.3 cases per 100,000 population.

The foodborne illness attribution estimates for 2016 [were released by the](#) Interagency Food Safety Analytics Collaboration (IFSAC) in late 2018. IFSAC used outbreak data to update previous analyses to estimate which foods are responsible for illness related to *Salmonella*, *Escherichia coli* O157, *Listeria monocytogenes*, and *Campylobacter*. IFSAC considers these priority pathogens because of the frequency (estimated 1.9 million illnesses each year combined) and severity of illness they cause, and because targeted interventions can significantly reduce these illnesses. The report noted that *Salmonella* illnesses came from a wide variety of foods, with more than 75 percent coming from seven food categories, including beef. Also, nearly 75 percent of *E. coli* O157 illnesses were linked to vegetable row crops, e.g., leafy greens, and beef.⁸

⁵ FSIS Microbiological Testing Program for Ready-to-Eat (RTE) Meat and Poultry Products, 1990–2017. https://www.fsis.usda.gov/wps/portal/fsis/topics/data-collection-and-reports/microbiology/testing-program-for-rte-meat-and-poultry-products/testing-program-rte/!ut/p/a1/jZBdC4lwFIZ_Sz9gbH5geWICpKUiUdluYvmxBrrJnIH9-pSu-rA879WB5-EcXohhAjEnN0aJYoKTctixdUYxsjTbRX5kayvkhYc42rguWujzHjj9AEJjoj8yDvrn-xMO6DJwAwpXTdQVMF4ImFQsleLRCRCloBxOVN4pxCmopqCQVKIQEUuWgyokChGegFm2pZDcAWZuq5IPpcXiE-PUbpPXxQmNnrv3QQJH5Dnyp6wmM91FX--S-Xdoec2YPWwlthQ!!/#results2017. Accessed June 14, 2019

⁶ Centers for Disease Control and Prevention. Foodborne Disease Active Surveillance Network (FoodNet) 2018 Preliminary Data. <https://www.cdc.gov/foodnet/reports/prelim-data-intro-2018.html>. Accessed June 14, 2019.

⁷ Centers for Disease Control and Prevention. Foodborne Disease Active Surveillance Network (FoodNet) 2018 Preliminary Data: Tables. <https://www.cdc.gov/foodnet/reports/prelim-data-2018.html>. Accessed June 14, 2019.

⁸ Interagency Food Safety Analytics Collaboration. Foodborne illness source attribution estimates for 2016 for *Salmonella*, *Escherichia coli* O157, *Listeria monocytogenes*, and *Campylobacter* using multi-year outbreak surveillance data, United States. Atlanta, Georgia and Washington, District of Columbia: U.S. Department of Health and Human Services, CDC, FDA, USDA/FSIS. November 2018. p. 2. <https://www.cdc.gov/foodsafety/ifsac/pdf/P19-2016-report-TriAgency-508.pdf>. Accessed June 14, 2019.

In July 2018, the Centers for Disease Control and Prevention released the Surveillance for Foodborne Disease Outbreaks — United States, 2009–2015.⁹ During this time period, 5,760 outbreaks were reported that resulted in 100,939 illnesses, 5,699 hospitalizations, and 145 deaths. Thirty (30) percent of outbreak-associated illnesses were caused by *Salmonella*. In total, outbreaks caused by *Listeria*, *Salmonella*, and Shiga toxin-producing *Escherichia coli* (STEC) were responsible for 82 percent of all hospitalizations and 82 percent of deaths reported.

More recently, there have been several high profile pathogen outbreaks attributed to ground beef. In 2018, there were 18 illnesses associated with *E. coli* O26 in four states, 33 percent of those infected were hospitalized and there was one death. There was also an outbreak of *Salmonella* Newport beginning in 2018 and ending in 2019 which resulted in over 400 illnesses in 40 states with 34 percent requiring hospitalization. Currently, there is an outbreak associated with *E. coli* O103 resulting in nearly 200 illnesses in 10 states with 16 percent of patients being hospitalized and two cases were diagnosed with hemolytic uremic syndrome. It is clear pathogens in beef remain a critical public health concern and ground beef remains a significant vulnerability.

Like pathogens, science and detection technologies have also continued to evolve. Public health officials and regulatory agencies are using whole genome sequencing (WGS) technology for genetic typing of bacteria, including pathogens relevant to food safety. WGS allows for significant improvement in foodborne disease outbreak detection and source traceback compared to earlier technologies. To improve public health, it is important to gain a better understanding of the virulence factors of pathogens found on beef. Learning why and how pathogens cause illness will enable the beef industry to more appropriately target interventions to minimize their presence and make improvements in public health.

The economic burden of illness is another factor in the costs associated with pathogen contamination. According to the U.S. Department of Agriculture's Economic Research Service, illnesses attributed to *Salmonella* cost \$3.6 billion, STEC (non-O157 and O157) cost nearly \$300 million, and *Listeria* costs \$2.8 billion in the 2013.¹⁰ These costs resulted from medical costs, lost productivity, and death. There are no acceptable levels for pathogenic organisms in beef products as evidenced by the level of foodborne illnesses in the United States. Because *Salmonella* is a significant source of illnesses, hospitalizations, deaths and related costs, research efforts focused on mitigating this threat in the beef supply will continue to be a key priority.

⁹ Dewey-Mattia D, Manikonda K, Hall AJ, Wise ME, Crowe SJ. Surveillance for Foodborne Disease Outbreaks — United States, 2009–2015. MMWR Surveill Summ 2018;67(No. SS-10):1–11. DOI: <http://dx.doi.org/10.15585/mmwr.ss6710a1>. Accessed June 14, 2019.

¹⁰ Hoffmann, Sandra, Bryan Macculloch, and Michael Batz. *Economic Burden of Major Foodborne Illnesses Acquired in the United States*, EIB-140, U.S. Department of Agriculture, Economic Research Service, May 2015. https://www.ers.usda.gov/webdocs/publications/43984/52807_eib140.pdf?v=42136. Accessed June 14, 2019.

Another beef industry cost associated with pathogen contamination is the reduced value of products testing positive. When a raw material or finished product tests positive for a pathogen, it cannot enter commerce unless it is thermally processed. If the product has already entered commerce, the product is subject to a recall. In both cases, a substantial reduction in value for the pathogen positive product and significant recall costs are incurred by the packer or processor.

The total costs of safety interventions and processes, medical and missed opportunity claims, recalls and reduced value of contaminated products cannot always be passed on to consumers. Most often these costs are borne by the industry and eventually passed on to beef producers through reduced live cattle values. Accordingly, there is a direct economic incentive for beef producers to invest in beef safety research to further reduce pathogenic contamination levels in raw materials and finished products to increase the value of their cattle and their return on investment.

For the foregoing reasons, foundational, applied research is the focus in this program. Integrated communication and educational initiatives will ensure that the data collected are shared with targeted audiences for application across the processing sectors. Outreach with stakeholder groups will inform and impact collaborative research and communication programs addressing the safety of U.S. beef products.

The beef industry must consistently produce products that are wholesome and safe to maintain and bolster consumer trust and grow demand. International and domestic consumers must have confidence that the U.S. beef items they and their families consume are produced using the best processes available, which are supported by science-based research. The threats in the microbial environment are constantly evolving. It is imperative that the beef processing industry have access to the most up-to-date science-based research to mitigate both current and emerging threats. This tactic provides practical, science-based research that can be used by in-plant personnel and others to ensure the safety of the U.S. beef supply.

A standing advisory committee of industry and academic experts, including other contractors to the beef checkoff, and practitioners will establish research priorities and evaluate proposals. As needed, a select group of beef industry members may be identified to develop and evaluate specific research projects in consultation with the standing advisory committee. Based upon their recommendations, contracts are awarded based on merit and priority need. Funding partners are identified as appropriate. After the award, the research contracts will be closely monitored to ensure timely and complete research work products are available for distribution to the industry.

Research findings will be disseminated to stakeholders and safety professionals through many means. Investigators will present their research at regional, national and international technical conferences as well as publish work in peer-reviewed materials. Research findings will also be shared with regulatory agencies to ensure they have all the evidence when making decisions impacting beef safety. AR activities and related

outcomes will be shared during sponsorship events and exhibits. The dissemination of research findings to the food safety community will aid the safety of, and consumer confidence in, beef products.

Measurable Objectives *(List at least three outcome-based objectives for this tactic):*

- Manage the execution of a minimum of three research projects addressing current knowledge gaps. Topics may include but are not limited to:
 - Identify the combination of virulence factors that cause human illness in pathogenic *Salmonella* and *E. coli*.
 - Evaluate how *Salmonella* exists and moves throughout the supply chain, including regional, seasonal and production practice differences on the prevalence, level and serotype on products, including lymph nodes.
 - Evaluate the efficacy of interventions during the grinding process to maximize reduction of microbial contamination in ground beef.
- Facilitate the dissemination of research data and knowledge sharing through at least four meetings, webinars, documents or other events targeted to safety professionals.
- Develop at a minimum three tools (web content, reviews, fact sheets, videos, etc.) that share post-harvest research results or summarize research to provide guidance and information for small and very small beef processing facilities including mobile slaughter units.

Performance Efficiency Measures

Consumer Reach Goal:

Consumer Engagement Goal:

Voice/KOL Reach Goal:

Voice/KOL Engagement Goal:

LRP Strategic Initiatives Addressed by this Tactic *(Check all that apply)*

Drive Export Growth	Grow Consumer Trust	Protect & Enhance Business Climate	Beef's Value Proposition
<input type="checkbox"/> Adopt animal I.D. traceability systems	<input type="checkbox"/> Ensure antibiotic stewardship	<input type="checkbox"/> Research & innovate new production technologies	<input type="checkbox"/> Develop crises management plans
<input type="checkbox"/> Increase market access	<input type="checkbox"/> Certify & verify production practices	<input type="checkbox"/> Ensure beef's inclusion in dietary recommendations	<input checked="" type="checkbox"/> Defend beef's product identity
<input type="checkbox"/> Promote unique attributes of U.S. beef	<input checked="" type="checkbox"/> Ensure beef safety	<input type="checkbox"/> Motivate producers & stakeholders to engage in issues	
	<input checked="" type="checkbox"/> Protect beef's image		
	<input type="checkbox"/> Engage beef advocates		

- Revolutionize beef marketing & merchandising
 Measure & improve sustainability
 Research & communicate beef's nutritional benefits
 Connect & communicate
 directly with consumers
 Improve our product

Committee(s) to Score this Tactic *(Check all that apply)*

Consumer Trust	Export Growth	Innovation	Nutrition & Health	Safety	Investor Relations	Mkt. Research
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Tactic B

Tactic Name: *Science-Based Research on the Nutritional and Health Benefits of Processed Beef, Knowledge Dissemination and Stakeholder Engagement*

Tactic Description:

All meat is processed to varying degrees. This can include any meat product produced via the physical or biochemical transformation of meat from its native form (*i.e.* carcass, wholesale cut) into a final or finished product deemed desirable by consumers.

For this purpose, the definition of further processed, as defined by the American Meat Science Association Meat Science Lexicon, will serve as the definition of processed meat.

Further Processing:

Any process where meat products undergo a transformation, beyond minimal processing, containing approved ingredients, and may be subjected to a preservation or processing step(s) through the application of salting, curing, fermentation, thermal processing (smoking and/or cooking), batter/breading, or other processes to enhance sensory, quality, and safety attributes. These products may include ready-to-cook and ready-to-eat products.¹¹

Within this definition, there are varying degrees or levels of complexity of processing ranging from seasoning and drying to make a product like beef jerky to multipart recipes requiring ingredients, formation and cooking for products like beef hot dogs. Given the differences in preparation, there are thousands of different varieties of processed meats.

Processed beef products can fit easily into healthy meals. Products such as marinated beef fajita strips and beef dinner sausage can be center of the plate food items joining

¹¹ Seman, D. L., D. D. Boler, C. C. Carr, M. E. Dikeman, C. M. Owens, J. T. Keeton, T. D. Pringle, J. J. Sindelar, D. R. Woerner, A. S. de Mello, and T. H. Powell. 2018. Meat Science Lexicon*. Meat and Muscle Biology 2:1-15. doi:10.22175/mmb2017.12.0059. <https://dl.sciencesocieties.org/publications/mmb/articles/2/3/1>. Accessed June 14, 2019.

vegetables and grains which together can lead to greater nutrition and nutrient absorption. Deli roast beef can easily be incorporated into a sandwich or as a salad topping for a healthy meal. Menu models have demonstrated how these processed products fit in a dietary pattern.

Research conducted within this tactic will provide scientific evidence to support the beef industry's ability to produce, market and maintain the public enjoyment of processed beef products as a convenient, affordable and safe source of high-quality protein. While the scope of processed beef products is broad in general, specific product types will be selected for research. These products may include, but are not limited to, beef jerky, beef snack sticks, deli beef products, beef hot dogs and beef sausages. Through science-based research, the role of processed beef products in a healthy, well-balanced diet will be defined. Data collected will be shared with key nutrition opinion leaders, regulatory authorities and all stakeholders, including State Beef Councils and producers.

Promoting processed beef products is critical to the bottom line of producers. A major component of many ready-to-eat and ready-to-cook processed beef items is 50 percent chemical lean (CL) beef trim. Approximately 10 percent of the weight of a fed steer carcass ends up as 50 percent CL trim, which is essentially, the largest "wholesale cut" on the beef carcass. Accordingly, the market value of the 50 percent CL trim, like the cut-out values of whole muscle cuts, directly affects live cattle prices. By creating demand for processed beef items, demand is created for 50 percent CL, which in turn bolsters live cattle prices and ROI for producers. That's why promoting this growing market segment impacts cattle prices.

Current retail reports underscore how promoting processed beef products is critical to the bottom line of cattle producers. The *Power of Meat 2019* report provides insights into consumer purchasing behaviors, preferences and beef's role in the meat case.

- Last year's retail data indicates that the processed meat category represents over \$34 billion in sales. Beef alone has approximately \$5.9 billion in sales.
- Nielsen data from January 2019 cites that \$23 billion of meat items are sold beyond the fresh meat department – including \$13 billion in the deli department.¹²
- In a given month, shoppers are buying meat across the store including 37% in the deli, 39% fully-cooked, and 49% frozen.¹³
- "The *Sealed Air/Cryovac National Meat Case Study* finds that 66 percent of the packages in the self-service case are fresh meat (beef, pork, lamb, veal, chicken and turkey) with the remaining 34 percent being items such as processed, fully-cooked and value-added meat/poultry."¹⁴

Applying the Meat Science Lexicon definition, fully-cooked meat products are processed meats. Fully-cooked meat and poultry products accounted for nearly \$11 billion in

¹² 202 Analytics. *2019 Power of Meat: An In Depth Look at Meat Department Through the Shoppers Eyes*. Food Marketing Institute and Foundation for Meat and Poultry Research and Education. p. 21

¹³ *Ibid.* p. 21.

¹⁴*Ibid.* p. 11.

storewide sales last year, an increase of 2.5 percent in dollar sales. A majority of fully-cooked meat sales come from the deli department, which represents \$6.1 billion in sales, growing 5.4 percent over last year. Fully-cooked beef accounted for \$117 million in sales, a 7 percent increase. While fully-cooked chicken and pork currently have greater shares of sales, sales of each decreased by 2 to 7 percent respectively.¹⁵ Sales of fully-cooked beef are growing faster than other species in this category.

Sixty-four percent of processed meat buyers surveyed had a brand preference.¹⁶ According to IRI, branded meat products, both manufacturer and private, accounted for \$32 billion in sales and beef's share is \$10.9 billion. Beef saw increases in both sales and volume, 1.3 and .5 percent respectively. While chicken had a similar increase in sales, pork sales decreased by 8 percent. Beef was the only species to increase in volume.¹⁷ Data did not detail sales or volume for branded processed beef.

Value-added meat products provided for \$4.6 billion in sales in 2018. Sales in dollars increased by 5.1 percent and volume by 3.4 percent. Beef represented half of value-added meat sales at \$2.3 billion. The 443 million pounds of value-added beef provided for an increase in dollars by 3.6 percent and .5 percent in pounds.¹⁸ According to the *Power of Meat*, value-added products are “addressing several trends driving growth in the perimeter and center-store categories: convenience and adventurous eating, the quest for fun and different flavor profiles, and the growing popularity of international cuisines, such as pre-marinated fajita meat.”¹⁹

The Report also notes, “younger shoppers are more likely to serve fully-cooked meat and poultry, either exclusively or in combination with fresh. Likewise, they are more likely to use value-added items when purchasing fresh – driving solid growth in both value-added and fully-cooked meat/poultry.”²⁰ No matter how you slice it, processed beef is extremely valuable to our industry.

However, a number of significant challenges face the processed beef category and are rooted in the same dogma—limit the consumption of red and processed meat for optimum health. The process to develop the 2020-2025 *Dietary Guidelines for Americans (Guidelines)* process is underway. During the 2015-2020 *Guidelines* process, nutritional experts questioned whether red and processed meat consumption are part of a “healthy” dietary pattern which ensure positive health outcomes and a sustainable environment. Continued research on the role of processed beef in healthy dietary patterns is critical to ensure they remain a part of federal dietary guidance.

In January 2019, the EAT-*Lancet* report on “Food in the Anthropocene: the EAT-*Lancet* Commission on healthy diets from sustainable food systems” was published. The report

¹⁵ *Ibid.* p. 23.

¹⁶ *Ibid.* p. 25.

¹⁷ *Ibid.* p. 27

¹⁸ *Ibid.* p. 13

¹⁹ *Ibid.* p. 14.

²⁰ *Ibid.* p. 3.

outlined dietary recommendations it claims are ideal for human and planetary health. The diet suggested that people limit red meat consumption to one serving per week and poultry to two servings per week. A large public relations effort and worldwide promotion tour have also been launched in conjunction with the report and it is already being cited by some policy makers as evidence in efforts to reduce meat consumption in schools. In March 2018, the International Agency for Research on Cancer (IARC) published the monograph declaring processed meats and red meats as carcinogenic agents.²¹ IARC is an authoritative body and this monograph can be included as support for federal or state policies or regulations. IARC is also expected to publish an updated World Cancer Report in September 2019. The report offers a unique global view of cancer, including cancer patterns, causes, and prevention. Recognized as an authoritative source of global perspective and information on cancer, the first edition appeared in 2003. IARC will not confirm if the report refers to red and processed meats' association with cancer. However, given the focus of the report and the growth of scientific evidence in this area, it is likely that it will be included.

The World Cancer Research Fund's (WCRF) *Third Expert Report: Diet, Nutrition, Physical Activity and Cancer: a Global Perspective*, released in May 2018 is another challenge. The Report's Cancer Prevention Recommendations include "limit red and processed meat – eat no more than moderate amounts of red meat, such as beef...eat little, if any, processed meat."²² The International Food Information Council in partnership with American Institute for Research on Cancer, the American branch of WCRF, will be releasing a report in the fall of 2019 focused on how cancer-prevention influences food choices among Gen X consumers. Together, these findings and anticipated reports continue to call into question whether red and processed meat can be included in a healthy diet. This tactic directly addresses these challenges with science-based research.

By demonstrating how processed beef products fit in a healthy dietary pattern associated with positive health outcomes, the conversation can be turned towards how these products can contribute to overall health and well-being and away from the focus on negative health outcomes. Research findings will be critical to ensure processed beef remains in the 2020-2025 *Dietary Guidelines for Americans* and future editions of dietary guidance. Every opportunity will be pursued to submit scientific research to add to the body of evidence in support of this effort.

A standing advisory committee of industry and academic experts, including other contractors to the beef checkoff, and practitioners will establish research priorities and evaluate proposals. Based upon their recommendations, contracts are awarded based on merit and priority need. After the award, the research contracts will be closely monitored to ensure timely and complete research work products are available for

²¹ IARC Monographs on the Evaluation of Carcinogenic Risks to Humans Volume 114: Red Meat and Processed Meat. <http://publications.iarc.fr/564>. Accessed June 14, 2019.

²² World Cancer Research Fund Third Expert Report, "Diet, Nutrition, Physical Activity and Cancer: a Global Perspective." 2018. <https://www.wcrf.org/dietandcancer/recommendations/limit-red-processed-meat>. Accessed June 4, 2019.

distribution to the industry. This tactic is focused on processed beef. If complementary research with other meat animal species is developed, they will be expected to contribute proportionally to the research funding.

Measurable Objectives *(List at least three outcome-based objectives for this tactic):*

- Manage the execution of a minimum of three research projects addressing current knowledge gaps. Topics may include:
 - Risk-benefit analysis on the consumption of processed beef products as a component of a healthy diet and lifestyle.
 - How does dietary intake, particularly dietary patterns, track across life stages from the introduction of foods, including processed beef, into childhood, and through older adulthood?
 - What is the relationship between types of dietary fat found in processed beef products consumed at each stage of life and neurocognitive development (birth to 18 years) or neurocognitive health (for those 18 years and older)?
- Facilitate the dissemination of research data and knowledge sharing through four meetings, webinars, documents or other events targeted to nutrition and beef industry professionals, key opinion leaders, registered dietitians, healthcare professions and retail influencers.
- Develop three tools (web content, infographics, reviews, fact sheets, videos, etc.) that substantiates processed beef product's role in a healthy, sustainable diet and active lifestyle. Tools will be targeted to registered dietitians, healthcare professionals, retail influencers, nutrition and beef industry professionals and key opinion leaders.

Performance Efficiency Measures

Consumer Reach Goal:

Consumer Engagement Goal:

Voice/KOL Reach Goal:

Voice/KOL Engagement Goal:

LRP Strategic Initiatives Addressed by this Tactic (Check all that apply)

Drive Export Growth	Grow Consumer Trust	Protect & Enhance Business Climate	Beef's Value Proposition
<input type="checkbox"/> Adopt animal I.D. traceability systems <input type="checkbox"/> Increase market access <input type="checkbox"/> Promote unique attributes of U.S. beef	<input type="checkbox"/> Ensure antibiotic stewardship <input type="checkbox"/> Certify & verify production practices <input type="checkbox"/> Ensure beef safety <input checked="" type="checkbox"/> Protect beef's image <input type="checkbox"/> Engage beef advocates	<input type="checkbox"/> Research & innovate new production technologies <input checked="" type="checkbox"/> Ensure beef's inclusion in dietary recommendations <input type="checkbox"/> Motivate producers & stakeholders to engage in issues <input type="checkbox"/> Develop crises management plans <input type="checkbox"/> Defend beef's product identity	<input type="checkbox"/> Revolutionize beef marketing & merchandising <input type="checkbox"/> Measure & improve sustainability <input checked="" type="checkbox"/> Research & communicate beef's nutritional benefits <input type="checkbox"/> Connect & communicate directly with consumers <input type="checkbox"/> Improve our product

Committee(s) to Score this Tactic (Check all that apply)

Consumer Trust	Export Growth	Innovation	Nutrition & Health	Safety	Investor Relations	Mkt. Research
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SUPPLEMENTAL INFORMATION FOR THIS AR

1. Will all work detailed in this AR be completed by the end of the fiscal year?
No

If not, please provide an explanation.

This is a three-year AR and work will be completed by September 30, 2022.

2. Please explain changes from FY 2019 approved AR:
Potential research topics have been updated in each tactic. Provided additional context on the importance of the research topics based on foodborne outbreaks attributed to beef in Tactic A and the potential for additional reports questioning the role of processed beef in a healthy dietary pattern in Tactic B.
3. List any proposed subcontractor/agencies that will be used to complete the work in this AR.
To be determined
4. Will all work with subcontractors be competitively bid?
No

If not, why not?

Work will be awarded through an RFP process and evaluation of research proposals by a standing committee comprised of industry and academic food safety and nutrition practitioners.

5. Please list any relationships between this AR and projects previously funded by the Operating Committee:

The Foundation for Meat and Poultry Research and Education and the North American Meat Institute previously administered post-harvest beef safety research through ARs # 1405, 1504, 1603, 1705 and 1811. FMPRE currently administers post-harvest beef safety and processed beef nutrition research through AR # 1910.

DETAILED BUDGET SUMMARY:

Source of Funding	Direct Costs	Implementation	Total
CBB/BPOC Funding Request:	\$950,000	\$450,000	\$1,400,000

Other Potential Funding	Direct Costs	Implementation	Total
Federation of SBCs Pledges: (Informational Only)	\$0	\$0	\$0
Other Funding: (Informational Only)	\$0	\$0	\$0
Total Cost	\$950,000	\$450,000	\$1,400,000

CBB/BPOC Funding Request:

Committee Name	Tactic	Tactic Name	Funding Source	Direct	Implementation	Total
<i>Safety</i>	A	Post-harvest Beef Safety Research, Knowledge Dissemination and Stakeholder Engagement	BPOC	\$ 600,000	\$ 300,000	\$ 900,000
<i>Nutrition and Health</i>	B	Science-Based Research on the Nutritional and Health Benefits of Processed Beef, Knowledge Dissemination and Stakeholder Engagement	BPOC	\$ 350,000	\$ 150,000	\$ 500,000
AR Totals				\$ 950,000	\$ 450,000	\$ 1,400,000

Total Cost Summary for All Funding Sources: (Informational only)

Committee	Tactic	Tactic Name	Funding Source	Direct	Implementation	Total
<i>Safety</i>	A	Post-harvest Beef Safety Research, Knowledge Dissemination and Stakeholder Engagement	All	\$ 600,000	\$ 300,000	\$ 900,000
<i>Nutrition and Health</i>	B	Science-Based Research on the Nutritional and Health Benefits of Processed Beef, Knowledge Dissemination and Stakeholder Engagement	All	\$ 350,000	\$ 150,000	\$ 500,000
AR Totals				\$ 950,000	\$ 450,000	\$ 1,400,000

Summary of Prior Year Budget:	FY 2019 Approved Budget						
	CBB/BPOC	FSCBs	Other Source(s)	Total	Direct Cost	Impl.	Total
AR Totals	\$ 800,000			\$ 800,000	\$ 560,000	\$ 240,000	\$ 800,000

FY 2019 Actual Expenses (through June 30, 2019)	FY 2019 Approved Budget						
	CBB/BPOC	FSCBs	Other Source(s)	Total	Direct Cost	Impl.	Total
AR Totals	\$ 231,840			\$ 231,840	\$ 109,661	\$ 122,179	\$ 231,840

Historical Summary of Budgets and Expense:	Total Approved Budgets			Total Actual Expenses		
	FY 2018	FY 2017	FY 2016	FY 2018	FY 2017	FY 2016
AR Totals	\$ 500,000	\$ 500,000	\$ 500,000	\$ 323,804	\$ 468,378	\$ 478,991

**POTENTIAL PARTNERSHIP LIST
FY 2020
AR Number: 2010-R**

Please list all potential partners/collaborators* for the related AR and details including the nature and extent of collaboration: (include any partnership and/or collaborations with a third party by identifying the third party, the nature of the collaboration and extent of the collaboration.)

1. **North American Meat Institute** – Collaborations could include in-kind staff support, research co-funding, dissemination of research, outreach and education opportunities.
2. **Foundation for Meat and Poultry Research and Education** – Collaboration could include research co-funding with non-Checkoff funds, dissemination of research, outreach and education opportunities.
3. **National Cattlemen’s Beef Association** – Collaborations could include co-funding research, dissemination of research, outreach and education opportunities.
4. **National Pork Board** - Collaborations could include co-funding research, dissemination of research, outreach and education opportunities.
5. **U.S. Poultry and Egg Association** - Collaborations could include co-funding research, dissemination of research, outreach and education opportunities.
6. **Beef Industry Food Safety Council** - Collaborations could include co-funding research, dissemination of research, outreach and education opportunities.
7. **American Meat Science Association** – Collaborations could include dissemination of research, outreach and education opportunities.
8. **American Association of Meat Processors** - Collaborations could include dissemination of research, outreach and education opportunities.
9. **Eastern Meat Packers Association** - Collaborations could include dissemination of research, outreach and education opportunities.
10. **Southwest Meat Association** - Collaborations could include dissemination of research, outreach and education opportunities.

11. **Food Marketing Institute** – Collaborations could include dissemination of research, outreach and education opportunities.
12. **National Grocers Association** – Collaborations could include dissemination of research, outreach and education opportunities.
13. **International Association for Food Protection** - Collaborations could include dissemination of research, outreach and education opportunities.
14. **Institute of Food Technologists** - Collaborations could include dissemination of research, outreach and education opportunities.
15. **Academy of Nutrition and Dietetics** - Collaborations could include dissemination of research, outreach and education opportunities.
16. **American Society for Nutrition** - Collaborations could include dissemination of research, outreach and education opportunities.
17. **International Food Information Council** - Collaborations could include dissemination of research, outreach and education opportunities.
18. **Niche Meat Processors Assistance Network** - Collaborations could include dissemination of research, outreach and education opportunities.

*Partners/collaborators does NOT include subcontractors listed in AR section V.C.
Subcontractor Info.

Required per USDA Letter dated June 19, 2013