

Tactic Quick Guides
Preliminary FY25 Tactics



Safety & Product
Innovation Committee

SAFETY & PRODUCT INNOVATION COMMITTEE

TACTIC OVERVIEW

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TATIC A | 2510-R

Post-Harvest Beef Safety Research

Name of Contractor: Meat Foundation

Start Date: 10/1/2024

End Date: 9/30/2027

CBB/BPOC Funding Request for this AR: \$750,000

CBB/BPOC Funding Request for this Tactic: \$750,000

Tactic A | 2510-R
Post-Harvest Beef Safety Research
Meat Foundation

TACTIC DESCRIPTION:

Food safety is critical to ensuring confidence in the beef products consumers choose to buy and feed their families. Foodborne pathogens can be introduced to beef products during harvesting and processing, among other times. Shiga toxin-producing *Escherichia coli* (STEC) O157:H7; O26, O45, O103, O111, O121, and O145 are classified as adulterants and prohibited from the beef supply. Data from the Food Safety and Inspection Service (FSIS) show the prevalence of STEC O157:H7 at 0.15 percent for raw ground beef components and 0.04 percent for ground beef in fiscal year (FY) 2023.¹ The prevalence of *Salmonella* spp. on raw ground beef components is 4.25 percent and 1.95 percent in raw ground beef in FY 2023.² Contamination of ready-to-eat meat and poultry, which is not broken out by species, by *Listeria monocytogenes* has remained relatively steady at a little more than one-half of one percent over the last few years.³ While current levels of pathogen contamination are relatively low, there remain areas for improving beef's safety profile.

Because of the significant public health concerns around *Salmonella*, FSIS issued a "Roadmap to Reducing *Salmonella*" as well as held a public meeting on the state of science in 2020.^{4,5} While current regulatory activities focus on *Salmonella* reduction efforts in poultry, these efforts can be instructive. FSIS has indicated they are considering replicating activities undertaken to reduce *Salmonella* in poultry for beef if they are successful. FSIS is proposing a new regulatory framework targeted at reducing *Salmonella* illnesses associated with poultry products. This proposed framework includes final product standards that would define whether certain raw poultry products contaminated with certain *Salmonella* levels and serotypes are adulterated and prohibited from commerce; requirements pertaining to how establishments monitor and document whether their processes for preventing microbial contamination are in control; and focuses on a non-regulatory approach for controlling *Salmonella* on incoming flocks.⁶ Further on May 1, 2024, FSIS issued its final determination that not ready-to-eat (NRTE) breaded stuffed chicken products that contain *Salmonella* at levels of 1 Colony Forming Unit per gram or higher are adulterated within the meaning of the Poultry Products Inspection Act (PPIA).⁷ When proposing the determination in 2023, FSIS included the rationale that, "Comminuted products are those that are ground, mechanically separated, or hand- or mechanically deboned and further chopped, flaked, minced, or otherwise processed to reduce particle size. Because of the nature of comminuted processes, *Salmonella* contamination in

chicken skin and bone can spread throughout an entire batch or lot through cross contamination.”⁸ Through this logic FSIS has addressed previous lawsuits that ruled *Salmonella* was inherent to the product and therefore could not be an adulterant but claiming *Salmonella* is only inherent to certain products within a carcasses (i.e. lymph nodes) and not all products like intact muscle. Although the determination addresses chicken there likely could be an application of the same reasoning to comminuted beef products. An application of such logic to beef would likely be spurred by an event such as a widespread foodborne illness outbreak. Research shows that pre-harvest, 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 continually upgraded to address these emerging threats. Without these continuous improvements, incidence 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.

The Interagency Food Safety Analytics Collaboration (IFSAC) released foodborne illness attribution estimates for 2021 in late 2023. 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 75 percent coming from seven food categories. Beef is attributed as the source of 6.5 percent of foodborne *Salmonella* illnesses, up one-half of a percent from 2020. Over 80 percent of *E. coli* O157 illnesses were linked to vegetable row crops, e.g., leafy greens, and beef. Specifically, beef is estimated to cause 20.9 percent of STEC O157 illnesses, showing declines from 22.8 percent in 2020 and 23.4 percent in 2019.⁹

Pathogens in beef remain a critical public health concern and ground beef remains a significant vulnerability. Healthy People 2030 have set public health goals to reduce illnesses attributed to STEC, *Salmonella* and *Listeria* as well as to reduce outbreaks attributed to STEC, *Campylobacter*, *Listeria*, and *Salmonella* infections linked to beef.¹⁰ It is clear regulatory and public health agencies are committed to reducing foodborne illnesses attributed to beef. While most consumers trust America’s meat industry to create products that are safe to eat, research shows that food safety is an ongoing concern, with concerns about raw meat contamination higher than that of raw produce.¹¹

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. FSIS now includes the FSIS Number – the whole genome sequencing (WGS) identifier assigned for pathogens – and allele codes with date stamps in laboratory sampling datasets. The FSIS Number applies to sampling results for *Listeria monocytogenes*, *Salmonella*, *Campylobacter*, and Shiga toxin-producing *Escherichia coli*, and this information is posted publicly. 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 2013.¹² 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.

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 safe and wholesome 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 and posing new risks to the safety of the beef supply. These changes can lead to new regulatory initiatives and require adaptations or scientific support for compliance. Yet, not all research is applicable to all facilities as they vary in size, capacity and types of beef products produced. 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. A one size fits all approach does not work when ensuring safe beef. As a result, while there may be a large body of scientific evidence in the literature, post-harvest beef safety research investments must continue to address these differences and emerging challenges. 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 experts 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. The Foundation, as a contractor to the Beef Checkoff, has a demonstrated history of bringing together funding partners. 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.

Citations:

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3. Ibid.
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11. Technomic. NAMI Protein PACT Q4 2023 Report. January 2024.
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▼ MEASURABLE OBJECTIVES

Measurable Objective #1

Manage the execution of a minimum of three research projects addressing current knowledge gaps. Topics may include but are not limited to: Evaluating points and indicators for *Salmonella* transmission and control in and throughout beef supply chain; determining the most effective location(s) from harvest to shipping to maximize reduction of microbial contamination in beef processing; identifying and validating antimicrobial interventions targeting *Salmonella*, *E. coli* O157:H7 and non-O157:H7 STECs in raw ground beef components; identifying and validate critical control points targeting *Salmonella*, *E. coli* O157:H7 and non- O157:H7 STECs in further processed beef items including dry fermented beef sausage.

Measurable Objective #2

Assess research impact over time by cataloging citations for research funded by the Beef Checkoff and administered by the Foundation. Initial target is to identify 10 references citing Beef Checkoff funded research used as a foundation for other research projects, to develop regulatory guidelines, standard operating procedures or best practices by the end date of this AR.

Measurable Objective #3

Facilitate the dissemination of research data and knowledge sharing through at least cumulatively four meetings, webinars, documents or other events targeted to safety professionals.

- Reaching at least 1,000 stakeholders through combined activities
- Newsletter distribution will achieve at least 27 percent open rate

Measurable Objective #4:

Conduct a webinar series, at least two per year, to highlight post-harvest safety research funded by the Beef Checkoff. Target cumulative audience of 500 food safety practitioners and interested stakeholders.

LRP INITIATIVES ADDRESSED BY THIS TACTIC

Improve the Business & Political Climate of Beef

- Drive continuous improvement in food safety

Safeguard & Cultivate Investment in Beef Industry Research, Marketing & Innovation

- Encourage the cooperation and collaboration of existing industry advisory committees to identify and prioritize research efforts

▼ CHECKOFF PROGRAM COMMITTEE(S) TO SCORE THIS TACTIC

Committee(s) to Score This Tactic:

Safety & Product Innovation

TACTIC A | 2511-R

Safety Research and Scientific Affairs

Name of Contractor: National Cattlemen's Beef Association

Start Date: 10/1/2024

End Date: 9/30/2027

CBB/BPOC Funding Request for this AR: \$9,642,800

CBB/BPOC Funding Request for this Tactic: \$1,217,800

Tactic A | 2511-R
Safety Research and Scientific Affairs
National Cattlemen's Beef Association

TACTIC DESCRIPTION:

NCBA, on behalf of the Beef Checkoff, leads the scientific research on improving beef safety in the segment where beef is raised, pre-harvest, and shares the insights gained across the industry and stakeholder community through scientific affairs. Research outcomes provide the pre-harvest beef production sector with evidence to evolve how cattle are raised to reduce the likelihood of cattle bringing chemical, physical, or biological hazards into the post-harvest production environment. Additionally, this research shows the dedication of producers to the broader community focused on improving the safety of beef. This is also the program that brings the industry together annually to hear food safety-related research and to tackle the industry's safety challenges at the Beef Industry Safety Summit. Building on the track record of tackling food safety issues and making scientifically valid recommendations for reducing *E. coli* O157 and the other shiga-toxin-producing *E. coli* (STECs) and *Salmonella* in the gastrointestinal tract, BSE and specified risk material, and recommendations for many of the post-harvest interventions utilized across the industry, this tactic has brought industry leaders together, commissioned key research and disseminated outcomes to stakeholders making daily beef safety decisions in the industry, to the regulatory environment and consumers.

This tactic targets the scientific community including established and emerging scientists recognized in their field of expertise, scientific organizations (American Meat Science Association, International Association for Food Protection, etc.), beef safety decision-makers throughout the industry (feedlot operators, packers, processors, retail, foodservice, corporate food safety scientist) and regulatory sectors.

In FY25, this program will invest in pre-harvest beef safety research that evaluates biological (pathogen) contamination/interventions/management strategies considering new regulatory requirements; physical contamination detection ante-mortem; and methodology advancements and contamination routes for detecting *Salmonella* as a leading cause of foodborne illness. Additionally, technical assessments/reviews will be commissioned to identify research gaps and/or to summarize existing research in the public domain to serve as an industry and scientific resource on a pre-harvest safety topic to reduce duplication of funding by entities (USDA, the beef industry, other Checkoff programs, private organizations, etc.). Scientific affairs programs will bring attention to beef safety research outcomes through

engagement with advisory groups, industry and regulatory thought leaders at briefings, research summits, conferences, and written and visual tools (infographics). Through collaborations with state beef councils (SBCs), other NCBA Checkoff programs, other Checkoff contractors (e.g., USMEF, AFBFA FMPRE, etc.), as well as other science-based organizations, universities, and institutions, program results will be shared widely through publications, scientific conferences, and deep-dive immersion experiences for broader impact. Strategic planning sessions will be conducted as needed to identify research gaps and collaborative research opportunities with third-party experts. This tactic directly addresses the demand drivers of eating experience and how beef is raised and grown.

▼ MEASURABLE OBJECTIVES

Measurable Objective #1

Fund Research Projects: Conduct a minimum of four (4) original pre-harvest safety scientific research projects or technical assessments focused on biological contamination, interventions, and/or management strategies considering new regulatory requirements, physical contamination detection ante-mortem, and/or methodology advancements and contamination routes for detecting *Salmonella*.

Measurable Objective #2

Build Research Acceptance: To build broader scientific understanding in beef safety, conduct science briefings with targeted safety thought leaders on new beef research and key topics such as beef's safety evolution and progress, pathogen reduction methods and beef's role in a OneHealth approach (minimum of 35). Reach at least five (5) new thought leaders (ex. emerging investigators) to expand the quantity and quality of scientists with interest in conducting and communicating beef research.

Measurable Objective #3

Place Research Results: Increase the visibility of pre-harvest beef safety findings by securing placement of research results (minimum of 45) internally (in other tactics/ARs or SBC partners) or externally (conferences, industry meetings, supply chain partners, communication/educational outlets, etc.) to improve the understanding of beef safety and research advancements.

LRP INITIATIVES ADDRESSED BY THIS TACTIC

Improve the Business & Political Climate of Beef

- Drive continuous improvement in food safety

Safeguard & Cultivate Investment in Beef Industry Research, Marketing & Innovation

- Encourage the cooperation and collaboration of existing industry advisory committees to identify and prioritize research efforts

CHECKOFF PROGRAM COMMITTEE(S) TO SCORE THIS TACTIC

Committee(s) to Score This Tactic:

Safety & Product Innovation

TACTIC C | 2511-C R
Product Quality Research and Technical Expertise

Name of Contractor: National Cattlemen's Beef Association

Start Date: 10/1/2024

End Date: 9/30/2027

CBB/BPOC Funding Request for this AR: \$9,642,800

CBB/BPOC Funding Request for this Tactic: \$1,289,900

Tactic C | 2511-R

Product Quality Research and Technical Expertise

National Cattlemen's Beef Association

TACTIC DESCRIPTION:

NCBA, on behalf of the Beef Checkoff, leads the sole tactic focused on beef product quality and extends those findings to industry stakeholders. The outcomes of this tactic build the scientific foundation and expand the opportunities to increase product consistency, utilization, and ultimately consumer satisfaction. Additionally, the findings of this tactic fill an essential industry need for disseminating product quality research findings outside of a competitive environment. This research initiative focuses on the product and ultimate consumer satisfaction through product diversity, cooking methodology and enhancing product consistency. Historically, this program has generated scientific evidence for utilizing the carcass through product management (tenderness, aging, muscle utilization/optimization/value cuts) for continuously improving consumer satisfaction. This research tactic has been essential to safeguard the foundation of eating experience and continue to provide opportunities for increasing product consistency.

This tactic engages key decision-makers and emerging leaders who are responsible for product management and scientific solutions. The audience consists of supply chain members, academia, government, and scientific associations (American Meat Science Association and International Community of Meat Scientists) focusing on the breadth of the industry from production influences on product management and ultimate end-user decisions. The expertise provided by these thought leaders delivers the opportunity to elevate them on technical agendas, symposia and outreach opportunities.

In FY25, this tactic will continue to build the scientific foundation by funding research focused on product optimization of today's carcasses population, cold chain management to reduce inconsistencies in eating experience, and opportunities to ensure product integrity for the ultimate consumer eating experience. Additionally, technical assessments/reviews will be commissioned to identify research gaps and/or to summarize existing research in the public domain to serve as an industry and scientific resource on a product quality topic to reduce duplication of funding by entities (USDA, Beef, and other Checkoff programs, private organizations, etc.). Key results are activated through technical summaries, peer-reviewed manuscripts, research presentations, science briefings, and other scientific affairs strategies. Furthermore, these will be leveraged through collaborations with state beef councils (SBCs), other NCBA Checkoff programs, other Checkoff contractors (USMEF, FMPRE, AFBFA, etc.), and scientific associations. Strategic planning sessions will be conducted as needed to identify research gaps and collaborative research opportunities with third-party experts. Taste is the top

reason consumers choose beef, and this topic addresses the demand drivers of eating experience, convenience/versatility, and price.^[1]

Citations:

^[1] Consumer Beef Tracker. Dec 2023

▼ MEASURABLE OBJECTIVES

Measurable Objective #1

Fund Research Projects: Conduct a minimum of 12 original product quality scientific research projects or technical assessments focused on product optimization, cold chain management, product integrity, and ensuring consistency of eating experience that leads to discoveries about beef quality and strengthens the scientific foundation and/or balances the body of evidence to reinforce beef's quality attributes within the scientific community.

Measurable Objective #2

Build Research Acceptance: To build broader scientific understanding in beef quality, conduct science briefings with targeted product quality thought leaders and provide industry relevant insights around product uniformity, opportunities to overcome eating quality inconsistencies, and optimization of product quality practices across the supply chain (minimum of 35). Target at least ten (10) new thought leaders (ex. emerging investigators) to expand the quantity and quality of scientists with interest in conducting and communicating research on beef.

Measurable Objective #3

Place Research Results: Increase the visibility of research findings through placement of product quality research results (minimum of 45) internally (other tactics/ARs or SBC partners) or externally (conferences, industry meetings, supply chain partners, communication/education outlets, etc.) to improve the understanding of beef quality and research advancements.

LRP INITIATIVES ADDRESSED BY THIS TACTIC

Develop and Implement Better Business Models to Improve Price Discovery and Value Distribution Across All Segments

- Use innovative methods and technologies to value carcasses based on eating satisfaction and red meat yield

Promote & Capitalize on the Multiple Advantages of Beef

- Engage consumers in a memorable beef eating experience
- Promote underutilized beef cuts and new variety meat products

Safeguard & Cultivate Investment in Beef Industry Research, Marketing & Innovation

- Encourage the cooperation and collaboration of existing industry advisory committees to identify and prioritize research efforts

▼ CHECKOFF PROGRAM COMMITTEE(S) TO SCORE THIS TACTIC

Committee(s) to Score This Tactic:

Safety & Product Innovation

TACTIC A | 2531-II 14th Annual NIAA Antibiotics Symposium

Name of Contractor: National Institute for Animal Agriculture

Start Date: 10/1/2024

End Date: 9/30/2025

CBB/BPOC Funding Request for this AR: \$228,716

CBB/BPOC Funding Request for this Tactic: \$113,078

Purpose and Description

**The section of the AR is being included, along with Tactic A, to provide Stakeholder Engagement committee members with more context about the NIAA's program(s).*

PURPOSE AND DESCRIPTION:

Science demonstrates significant improvements have been made in how farmers, ranchers, and veterinarians utilize antimicrobials in beef production over the past several decades. Improvements have been achieved through implantation of judicious use guidelines[1], regulatory updates[2], vaccination programs[3], improved animal husbandry, biosecurity, data-driven decision making, development of antibiotic alternatives[4],[5], genetic selection[6], and educational programs[7].

Yet, U.S. and global consumers still have significant concerns about livestock farming [beef production.]

Farmers and ranchers continue to face an ever-changing landscape of issues and areas they are asked to address. From environmental stewardship to worker health and safety, and animal health [antibiotic use] to human nutrition. There is never a shortage of topics to address via research, education, and promotion.

Antibiotic use in beef production continues to be a robust topic of conversation within the scientific community as well as the public [consumer influencers and consumers]. Even with significant changes in on-farm/ranch practices and new rules and regulations affecting antibiotic use, public opinion in the United States regarding livestock farming, antibiotic use, and its connection to antimicrobial resistance (AMR) is increasingly critical, with concerns largely focused on public health implications.

Leading “voices” that are influential amongst consumers and influential leaders who affect the beef industry’s *Freedom to Operate*, are “vocal.” Many online discussions and articles highlight that a significant portion of antibiotics sold in the U.S. is used in livestock production, not for treating sick animals, but for promoting growth and preventing disease in healthy animals. Through published articles and blog posts, critics of beef production report that the widespread use of antibiotics is linked to the rise in antibiotic-resistant bacteria, which poses a serious health threat. [8]

Organizations like the Natural Resources Defense Council (NRDC) and scientific journals have reported that the intensity of antibiotic use in U.S. livestock is nearly double that of Europe.[9] Correlating that this high level of use contributes significantly to the development and spread of antibiotic-resistant bacteria. They note that European policies have successfully reduced antibiotic use in livestock through stringent regulations, and advocate that this is a model many experts suggest the U.S. should follow.

Public concern is also reflected in the increasing demand for antibiotic-free meat and calls for stricter regulations on antibiotic use in farming[10]. Reports from Nature and other academic sources emphasize the need for urgent action to mitigate the risk of antimicrobial resistance, which threatens both human and animal health.

Overall, the popular opinion is that while antibiotics are essential for treating infections, their overuse in livestock farming is dangerous and unsustainable. There is a strong push for different [better in their mind] management practices and policies to curb unnecessary antibiotic use to protect public health.

Additionally, AMR is recognized as one of the most significant threats to global public health, posing severe challenges across human, animal, and environmental health sectors. Topics of significant interest based on prevalent research areas:

Global Public Health Threat

AMR is increasingly viewed as a critical issue due to its widespread impact and the potential for severe outcomes.[11] According to the World Health Organization (WHO), AMR is one of the top ten global public health threats facing humanity. The rise in drug-resistant infections undermines advances in modern medicine, leading to prolonged illness, higher mortality rates, and increased healthcare costs.[12]

Impact on Human Health

AMR results in infections that are harder to treat and more likely to spread, leading to prolonged hospital stays, higher medical costs, and increased mortality. The Centers for Disease Control and Prevention (CDC) estimate that in the United States alone, at least 2.8 million people get an antibiotic-resistant infection annually, and more than 35,000 people die as a result. Globally, it's estimated that AMR could cause 10 million deaths per year by 2050 if no action is taken.[13]

One Health Perspective

The One Health approach, which integrates human, animal, and environmental health, is essential for combating AMR. The interconnectedness of these sectors means that antimicrobial use and resistance in one area can directly affect the others. For instance, the use of antibiotics in livestock can lead to the development of resistant bacteria, which can then be transmitted to humans through the food chain or environmental pathways.[14]

Economic Impact

The economic burden of AMR is substantial. It includes direct costs such as increased healthcare expenses and indirect costs like loss of productivity. A report by the World Bank projected that AMR could have significant economic consequences, potentially reducing global GDP by up to 3.8% annually by 2050, with the cost of healthcare rising sharply due to more expensive treatments and longer hospital stays.[15]

Comparison with Other Public Health Issues

While other public health challenges, such as non-communicable diseases (NCDs), infectious diseases like HIV/AIDS and tuberculosis, and emerging pandemics (e.g., COVID-19), are also critical, AMR's unique characteristic is its potential to undermine the effectiveness of antibiotics that are essential for treating a wide range of infections. This cross-cutting impact makes AMR a distinct and pressing issue compared to other health concerns. The failure to address AMR effectively can exacerbate other health

problems by reducing the efficacy of treatments for infections that complicate conditions such as surgery, cancer therapy, and chronic diseases.[16]

AMR is a paramount public health issue with wide-ranging implications for human, animal, and environmental health. Its management requires a coordinated, multi-sectoral approach as advocated by the One Health framework. Given its potential to significantly impact healthcare outcomes and economic stability globally, AMR remains a high-priority topic in the grand scheme of public health. And, for the beef sector and other animal agriculture sectors of today's food system.

When scientific communities and influential organizations and consumers are "leading" conversations about antibiotic use, stewardship, and antimicrobial resistance, farmers, ranchers, veterinarians, and allied animal agriculture leaders need to be in the conversation.

The National Institute for Animal Agriculture (NIAA) believes continuous improvement on topics such as the responsible use of antibiotics will be shaped by engaging consistently and effectively through the communication of scientific collaboration, and a commitment on the part of the broad animal agriculture sector and its allies to combat antimicrobial resistance (AMR).

The 14th Annual NIAA Antibiotics Symposium and subsequent activities is a foundational convening that continues to support Beef Checkoff contractors, NIAA members, and all animal agriculture leaders in their work – engaging with influencers and consumers in meaningful ways. The knowledge and skills garnered and honed at Symposium allow beef producers to engage with influential leaders, including:

- Association of State & Territorial Health Officials
- Consumer packaged goods companies
- Food & Agriculture Organization of the United Nations
- General Assembly of State Veterinarians
- Meat and poultry processors
- National Association of Public Health Veterinarians
- Presidential Advisory Council to Combat Antimicrobial Resistance
- Restaurants and retailers
- The Centers for Disease Control and Prevention
- University and college researchers
- U.S. Food & Drug Administration
- U.S. Department of Agriculture
- U.S. Department of State
- U.S. Environmental Protection Agency
- World Health Organization

Citations:

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- [15] Jonas, Olga B.; Irwin, Alec; Berthe, Franck Cesar Jean; Le Gall, Francois G.; Marquez, Patricio V.. March 1, 2017. *Drug-resistant infections : a threat to our economic future* (Vol. 2) : final report (English). HNP/Agriculture Global Antimicrobial Resistance Initiative Washington, D.C. : World Bank Group. <http://documents.worldbank.org/curated/en/323311493396993758/final-report>
- [16] United Nations Interagency Coordination Group on Antimicrobial Resistance. (2019). *No Time to Wait: Securing the future from drug-resistant infections*. Accessed May 31, 2024. www.who.int/publications/i/item/no-time-to-wait-securing-the-future-from-drug-resistant-infections

TACTIC DESCRIPTION:

The 14th Annual NIAA Antibiotics Symposium continues the work and collaborations established in prior symposia, funded in part by the Beef Checkoff. The FY '25 Symposium focuses on continued knowledge and insights about responsible antibiotic use and the primary efforts aimed at combating antimicrobial resistance (AMR). All components of the Symposium impact the beef value chain:

- 1) **Science:** understanding causal links, resistance mechanisms, bacterial genomics, the microbiome, current/future research, and more.
- 2) **Alternatives:** preventative and intervention strategies, ensuring antibiotic stewardship, needs and challenges, innovation, and technology.
- 3) **Communication:** How to effectively engage beef producers with reliable information, which can be shared when beef producers are engaging with influencers and consumers.
- 4) **Education:** How are all educators – K-12, colleges, and universities, are preparing the next generation to utilize antibiotics responsibly while engaging in AMR conversations and solutions?

The Symposium is unique in its design as it follows the **One Health¹** approach. **One Health** recognizes the health of people is connected to the health of animals and the environment. Building upon previous Symposia and current societal drivers, the Symposium explores and connects the responsible use of antibiotics to sustainable beef production as defined by the U.S. Roundtable for Sustainable Beef - *environmentally sound, socially responsible, and economically viable beef*.

The Symposium creates a synergistic environment where stakeholders from Qualified State Beef Councils, national beef organizations, the Centers for Disease Control & Prevention (CDC), the U.S. Food & Drug Administration (FDA), United States Department of Agriculture (USDA), American Veterinary Medical Association (AVMA), National Institute for Antimicrobial Resistance Research and Education (NIAMRRE), state public health offices, and experts from all points along the animal agriculture supply chain (producers, packers, retailers, etc.), industry associations, and other animal agriculture leaders can come together to recognize the progress and diligent efforts of industry and veterinary medicine and the work that has broadened the **One Health** collaboration with human medicine and environmental activities. In addition, the Symposium fosters shared learning, networking, and collaboration as, together, food and agriculture system leaders continuously improve the responsible use of antibiotics in animal agriculture while ensuring animal agriculture is doing its part to combat antimicrobial resistance (AMR).

Through keynote addresses, panel conversations and breakout sessions that allow for further exploration and application of knowledge, beef producers leave the Symposium and allied activities with skills, knowledge, and insights to more effectively engage with key opinion leaders as they preserve and enhance trust in beef production, safety, and products. Farmers and

ranchers also leave with additional resources to add to the 2020 Beef Checkoff-funded toolkit of resources to ensure they are able to engage with influencers and consumers on a variety of platforms – social media, traditional media, in-person, etc.

Citations:

¹ World Health Organization. "One Health" - [One health \(who.int\)](https://www.who.int). Accessed 13 June 2024.

MEASURABLE OBJECTIVES

Measurable Objective #1

Stakeholders from all segments will attend the 2024 Symposium: Animal agriculture leaders (including beef producers), processors, retailers, research scientists, academia, environmental NGOs, human health professionals, and government. Success is:

- At least 80 percent of attendees sharing that the Symposium improves their knowledge and understanding of responsible antibiotic use and measure to combat AMR.
- A successful Symposium will have 80 percent of attendees reporting increased knowledge and skills about communicating with influencers and consumers.

Measurable Objective #2

Engage at least two state beef councils in pre- and post-Symposium media interviews, such as commercial radio, podcasts, farm news, etc. that reach a minimum of 65,000 beef producers with key take-aways advanced by the Symposium agenda.

Measurable Objective #3

Creation of a comprehensive White Paper detailing insights shared during the 14th Annual NIAA Antibiotics Symposium with a specific webinar for Qualified State Beef Councils (QSBCs) following Symposium to discuss application of key insights from the White Paper to support the work of QSBCs.

LRP INITIATIVES ADDRESSED BY THIS TACTIC

Grow Consumer Trust in Beef Production

- Align and collaborate with traditional and nontraditional partners to tell the positive story of beef cattle production
- Educate medical, diet and health professionals about beef and beef production
- Engage positively in the sustainable nutrition conversation
- Intensify efforts in educating consumers as well as supply chain decision makers about the benefits of animal care programs like BQA and their impacts on animal well-being

Improve the Business and Political Climate of Beef

- Demonstrate beef's positive sustainability message and key role in regenerative agriculture
- Drive continuous improvement in food safety

Safeguard and Cultivate Investment in Beef Industry Research

Marketing and Innovation

- Encourage the cooperation and collaboration of existing industry advisory committees to identify and prioritize research efforts
- Increase industry funds for beef marketing, promotion and research
- Educate producers, lawmakers, and industry stakeholders on the benefits and the impact of the Beef Checkoff
- Cultivate preventative animal care and wellness technologies

▼ CHECKOFF PROGRAM COMMITTEE(S) TO SCORE THIS TACTIC

Committee(s) to Score This Tactic: Safety & Product Innovation, Stakeholder Engagement

TACTIC B | 2531-II

Beef Producer Engagement with Public Health Leaders

Name of Contractor: National Institute for Animal Agriculture

Start Date: 10/1/2024

End Date: 9/30/2025

CBB/BPOC Funding Request for this AR: \$228,716

CBB/BPOC Funding Request for this Tactic: \$115,638.00

Purpose and Description

**The section of the AR is being included, along with Tactic A, to provide Stakeholder Engagement committee members with more context about the NIAA's program(s).*

PURPOSE AND DESCRIPTION:

Science demonstrates significant improvements have been made in how farmers, ranchers, and veterinarians utilize antimicrobials in beef production over the past several decades. Improvements have been achieved through implantation of judicious use guidelines[1], regulatory updates[2], vaccination programs[3], improved animal husbandry, biosecurity, data-driven decision making, development of antibiotic alternatives[4],[5], genetic selection[6], and educational programs[7].

Yet, U.S. and global consumers still have significant concerns about livestock farming [beef production.]

Farmers and ranchers continue to face an ever-changing landscape of issues and areas they are asked to address. From environmental stewardship to worker health and safety, and animal health [antibiotic use] to human nutrition. There is never a shortage of topics to address via research, education, and promotion.

Antibiotic use in beef production continues to be a robust topic of conversation within the scientific community as well as the public [consumer influencers and consumers]. Even with significant changes in on-farm/ranch practices and new rules and regulations affecting antibiotic use, public opinion in the United States regarding livestock farming, antibiotic use, and its connection to antimicrobial resistance (AMR) is increasingly critical, with concerns largely focused on public health implications.

Leading “voices” that are influential amongst consumers and influential leaders who affect the beef industry’s *Freedom to Operate*, are “vocal.” Many online discussions and articles highlight that a significant portion of antibiotics sold in the U.S. is used in livestock production, not for treating sick animals, but for promoting growth and preventing disease in healthy animals. Through published articles and blog posts, critics of beef production report that the widespread use of antibiotics is linked to the rise in antibiotic-resistant bacteria, which poses a serious health threat. [8]

Organizations like the Natural Resources Defense Council (NRDC) and scientific journals have reported that the intensity of antibiotic use in U.S. livestock is nearly double that of Europe.[9] Correlating that this high level of use contributes significantly to the development and

spread of antibiotic-resistant bacteria. They note that European policies have successfully reduced antibiotic use in livestock through stringent regulations, and advocate that this is a model many experts suggest the U.S. should follow.

Public concern is also reflected in the increasing demand for antibiotic-free meat and calls for stricter regulations on antibiotic use in farming[10]. Reports from Nature and other academic sources emphasize the need for urgent action to mitigate the risk of antimicrobial resistance, which threatens both human and animal health.

Overall, the popular opinion is that while antibiotics are essential for treating infections, their overuse in livestock farming is dangerous and unsustainable. There is a strong push for different [better in their mind] management practices and policies to curb unnecessary antibiotic use to protect public health.

Additionally, AMR is recognized as one of the most significant threats to global public health, posing severe challenges across human, animal, and environmental health sectors. Topics of significant interest based on prevalent research areas:

Global Public Health Threat

AMR is increasingly viewed as a critical issue due to its widespread impact and the potential for severe outcomes.[11] According to the World Health Organization (WHO), AMR is one of the top ten global public health threats facing humanity. The rise in drug-resistant infections undermines advances in modern medicine, leading to prolonged illness, higher mortality rates, and increased healthcare costs.[12]

Impact on Human Health

AMR results in infections that are harder to treat and more likely to spread, leading to prolonged hospital stays, higher medical costs, and increased mortality. The Centers for Disease Control and Prevention (CDC) estimate that in the United States alone, at least 2.8 million people get an antibiotic-resistant infection annually, and more than 35,000 people die as a result. Globally, it's estimated that AMR could cause 10 million deaths per year by 2050 if no action is taken.[13]

One Health Perspective

The One Health approach, which integrates human, animal, and environmental health, is essential for combating AMR. The interconnectedness of these sectors means that antimicrobial use and resistance in one area can directly affect the others. For instance, the use of antibiotics in livestock can lead to the development of resistant bacteria, which can then be transmitted to humans through the food chain or environmental pathways.[14]

Economic Impact

The economic burden of AMR is substantial. It includes direct costs such as increased healthcare expenses and indirect costs like loss of productivity. A report by the World Bank projected that AMR could have significant economic consequences, potentially reducing global GDP by up to 3.8% annually by 2050, with the cost of healthcare rising sharply due to more expensive treatments and longer hospital stays.[15]

Comparison with Other Public Health Issues

While other public health challenges, such as non-communicable diseases (NCDs), infectious diseases like HIV/AIDS and tuberculosis, and emerging pandemics (e.g., COVID-19), are also

critical, AMR's unique characteristic is its potential to undermine the effectiveness of antibiotics that are essential for treating a wide range of infections. This cross-cutting impact makes AMR a distinct and pressing issue compared to other health concerns. The failure to address AMR effectively can exacerbate other health problems by reducing the efficacy of treatments for infections that complicate conditions such as surgery, cancer therapy, and chronic diseases.[16] AMR is a paramount public health issue with wide-ranging implications for human, animal, and environmental health. Its management requires a coordinated, multi-sectoral approach as advocated by the One Health framework. Given its potential to significantly impact healthcare outcomes and economic stability globally, AMR remains a high-priority topic in the grand scheme of public health. And, for the beef sector and other animal agriculture sectors of today's food system.

When scientific communities and influential organizations and consumers are “leading” conversations about antibiotic use, stewardship, and antimicrobial resistance, farmers, ranchers, veterinarians, and allied animal agriculture leaders need to be in the conversation.

The National Institute for Animal Agriculture (NIAA) believes continuous improvement on topics such as the responsible use of antibiotics will be shaped by engaging consistently and effectively through the communication of scientific collaboration, and a commitment on the part of the broad animal agriculture sector and its allies to combat antimicrobial resistance (AMR).

The 14th Annual NIAA Antibiotics Symposium and subsequent activities is a foundational convening that continues to support Beef Checkoff contractors, NIAA members, and all animal agriculture leaders in their work – engaging with influencers and consumers in meaningful ways. The knowledge and skills garnered and honed at Symposium allow beef producers to engage with influential leaders, including:

- Association of State & Territorial Health Officials
- Consumer packaged goods companies
- Food & Agriculture Organization of the United Nations
- General Assembly of State Veterinarians
- Meat and poultry processors
- National Association of Public Health Veterinarians
- Presidential Advisory Council to Combat Antimicrobial Resistance
- Restaurants and retailers
- The Centers for Disease Control and Prevention
- University and college researchers
- U.S. Food & Drug Administration
- U.S. Department of Agriculture
- U.S. Department of State
- U.S. Environmental Protection Agency
- World Health Organization

Citations:

[1] Beef Quality Assurance. *Antibiotic Stewardship for Beef Producers*. (2020). National Cattlemen's Beef Association, Accessed May 31, 2024. www.ncba.org/Media/NCBAorg/Docs/bqa-antibiotics-2020.pdf

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- [4] Callaway, T. R., et al. *Probiotics, prebiotics and competitive exclusion for prophylaxis against bacterial disease*. Animal Health Research Reviews (2008).
- [5] Wallace, R. J., et al. *Phytochemicals in animal health: Flavonoids and related compounds*. Journal of Animal Science (2010).
- [6] Berry, D. P., & Kearney, J. F. *Genetics of feed efficiency in dairy and beef cattle*. Journal of Animal Science (2011).
- [7] Checkley, S. L., et al. *Antimicrobial stewardship programs: an essential measure to combat antimicrobial resistance in animals and humans*. Canadian Veterinary Journal (2018).
- [8] Wallinga, MD, David, Natural Resource Defense Council. December 1, 2022. *U.S. Livestock Industries Persist in High-Intensity Antibiotic Use*. Accessed May 31, 2024. <https://www.nrdc.org/resources/us-livestock-industries-persist-high-intensity-antibiotic-use>
- [9] Reardon, Sara, Nature. February 6, 2023. *Antibiotic use in farming set to soar despite drug-resistance fears*. Accessed May 31, 2024. <https://www.nature.com/articles/d41586-023-00284-x>
- [10] Anne-Marie Roerink, Principal, 210 Analytics LLC, *The Power of Meat 2022*, Report sponsored by Sealed Air Food Care Division/Cryovac® and Published by FMI and the Foundation for Meat & Poultry Research & Education
- [11] Food and Agriculture Organization of the United Nations. *Antimicrobial Resistance*. Accessed May 31, 2024. <https://www.fao.org/antimicrobial-resistance/en/>
- [12] World Health Organization. November 21, 2023. *Antimicrobial resistance*. Accessed May 31, 2024. <https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance>
- [13] Centers for Disease Control and Prevention. March 20, 2024. *2019 Antibiotic Resistance Threats Report*. Accessed May 31, 2024. https://www.cdc.gov/antimicrobial-resistance/data-research/threats/?CDC_AAref_Val=https://www.cdc.gov/drugresistance/biggest-threats.html
- [14] Centers for Disease Control and Prevention. February 29, 2024. *One Health*. Accessed May 31, 2024. <https://www.cdc.gov/one-health/about/index.html>
- [15] Jonas, Olga B.; Irwin, Alec; Berthe, Franck Cesar Jean; Le Gall, Francois G.; Marquez, Patricio V.. March 1, 2017. *Drug-resistant infections : a threat to our economic future* (Vol. 2) : final report (English). HNP/Agriculture Global Antimicrobial Resistance Initiative Washington, D.C. : World Bank Group. <http://documents.worldbank.org/curated/en/323311493396993758/final-report>
- [16] United Nations Interagency Coordination Group on Antimicrobial Resistance. (2019). *No Time to Wait: Securing the future from drug-resistant infections*. Accessed May 31, 2024. www.who.int/publications/i/item/no-time-to-wait-securing-the-future-from-drug-resistant-infections

TACTIC DESCRIPTION:

Previously, the Beef Checkoff has provided specific funding for beef producers to engage in antibiotic Symposia events and a subsequent meeting with the Centers for Disease Control and Prevention (CDC) and related public health groups. Building on the positive outcomes of previous producer engagement with the CDC, a group of state beef council producer leaders will attend and participate in the Antibiotic Symposium and after the Symposium host CDC leaders to specifically learn about beef and dairy production during a NIAA-facilitated farm/ranch tour.

Beef producers will be empowered to use face-to-face presentations to share information on both scientific developments learned at the Symposium and at the CDC meeting specifically within the beef industry to influence their peers' commitment toward continuous improvement, related to responsible antibiotic use. In addition, they will share the results of communication strategies and effectively communicating the safety and wholesomeness of beef.

This tactic includes support for working with Qualified State Beef Councils (QSBCs) to attend Symposium and host CDC and public health leaders during a far/ranch tour.

▼ MEASURABLE OBJECTIVES

Measurable Objective #1:

20 QSBC farmer/rancher leaders and state staff participating in the 14th Annual NIAA Antibiotics Symposium.

Measurable Objective #2:

20 QSBC farmer/rancher leaders and state staff participating in a FY '25 CDC and public health officials farm/ranch tour focused on beef and dairy production.

Measurable Objective #3:

At least five (5) social media post assets showcasing the engagement between farmers and ranchers and CDC and public health officials prepared for Qualified State Beef Councils (QSBCs) to utilize in their consumer engagement. Social media assets will include pictures, graphics, and verbiage.

LRP INITIATIVES ADDRESSED BY THIS TACTIC

Grow Consumer Trust in Beef Production

- Align and collaborate with traditional and nontraditional partners to tell the positive story of beef cattle production
- Educate medical, diet and health professionals about beef and beef production

- Intensify efforts in educating consumers as well as supply chain decision makers about the benefits of animal care programs like BQA and their impacts on animal well-being

Improve the Business and Political Climate of Beef

- Demonstrate beef's positive sustainability message and key role in regenerative agriculture
- Drive continuous improvement in food safety

Safeguard and Cultivate Investment in Beef Industry Research Marketing and Innovation

- Attract innovation and intellectual capital and cultivate the next generation of talent into the beef industry
- Encourage the cooperation and collaboration of existing industry advisory committees to identify and prioritize research efforts
- Increase industry funds for beef marketing, promotion and research
- Educate producers, lawmakers, and industry stakeholders on the benefits and the impact of the Beef Checkoff.

▼ CHECKOFF PROGRAM COMMITTEE(S) TO SCORE THIS TACTIC

Committee(s) to Score This Tactic: Safety & Product Innovation, Stakeholder Engagement

