

American Farm Bureau Foundation for Agriculture

AR# 2421-CI

AR Title: Beef-Based Curriculum Resources & On The Farm STEM

AR Purpose and Description:

"An investment in knowledge pays the best interest."

~Benjamin Franklin~

Primary Goal:

Provide science and STEM teachers and students with high-quality immersive experiences and materials to teach science through the lens of beef production, thereby increasing agricultural awareness and literacy in teachers and students, resulting in increased consumer trust and interest in the beef industry.

The American Farm Bureau Foundation for Agriculture (AFBFA) is driven by its mission to build awareness, understanding, and a positive public perception of agriculture through education. Over the course of the last eight years, with support from the Beef Checkoff, AFBFA has expanded its reach and engagement in science classrooms across the country. The goal of this AR is to continue building awareness and understanding of the cattle industry through science education.

Conceptual shifts in education have driven teachers to connect agriculture's relevancy to today's science challenges and authenticity in the lessons they teach. Traditional textbook companies cannot keep up with the rapid rate of information distribution in the 21st Century, nor can they address the new ways in which teachers engage with their students. As such, more and more teachers are creating their own curricula, turning to the internet for research, content, and guidance. As agriculture is highly relevant and connects with everyone's lives, it is a valuable context for teaching students how science is applied in the real world. More and more examples of lessons featuring agriculture as context can now be found online. However, these resources tend to be one-sided or inaccurate, and they are being implemented and taught to millions of students each year with little to no support.

As educators take on the challenge of building curricula, a unique opportunity exists to create collaborations between industries. The benefits to the beef industry from working with non-traditional partners like educators are broad, from a more educated consumer base to a clearer understanding of beef's sustainability practices to an expanded talent pool for jobs in the agriculture industry. These collaborative efforts ensure that accurate information about the beef industry reaches classrooms and that more people understand the industry's efforts in land stewardship, animal care, and sustainability.

Educating students and teachers about scientific concepts through the lens of beef production results in higher levels of critical thinking and an increased ability to recognize relevant misconceptions. Further, this deeper understanding leads to a more positive perception of the beef industry. This program's ability to build beef demand and protect beef's image was made apparent from the following data collected via a 2021 survey of science educators:

"Overall, those educators who have attended an event or participated in one of AFBFA's programs tend to have more positive perceptions of the beef industry as a result of the information they learned. Of educators who have attended at least one of the programs:

- 92% state that AFBFA programs have furthered their students' understanding of the importance of the beef industry to society 82% have a positive perception of how cattle are raised for beef production
- 85% believe that the beef industry is very important to society
- Those who have attended a program are, on average, 8 points more likely to trust positive statements about beef production than those who had not attended"

Additionally, educators provided explanations of why their perceptions of beef production changed positively after participating in the On the Farm STEM Immersive Experience. They shared that their existing perception of beef production was that of unsustainable agricultural practices carried out using an uncaring corporate-style management structure. They reported that the On The Farm STEM Program allowed them to:

- Observe how passionate farmers were about their work and how much they cared for the health and quality of their animals.
- Observe the amount of science and technology that goes into farming.**

* Data is sourced from AFBFA's third-party "External Program Review Report," which is managed through the Checkoff Evaluation Committee and conducted in 2020.

** Data is sourced through a third-party education group, West Ed. The "Participant Experiences Evaluation Report" was collected in 2021 at the On the Farm STEM Immersive Experience in Nashville, TN.

CBB Budget Category: Consumer Information

Start Date: 10/1/2023

End Date: 9/30/2024

FY24 CBB/BPOC Funding Request		
Direct Costs	Implementation	Total
\$680,000.00	\$120,000.00	\$800,000.00

Beef Industry Long Range Plan (LRP) Core Strategies Addressed by this AR:

- Grow Consumer Trust in Beef Production

AR Tactic(s)

Tactic A | 2421-CI

Immersive professional development and accurate science education materials for STEM educators

American Farm Bureau Foundation for Agriculture

Tactic Description:

NOTE: STEM stands for science, technology, engineering, and mathematics. In this AR, the term STEM is used to categorize teaching and learning that incorporates the concepts of these fields. Often, teachers work in departments made up of instructors from each discipline, or many districts offer courses that incorporate each field of study as a single class or section.

Tactic Description:

Tactic A continues the work that has been produced in prior years with the goal of expanding reach and impact. This AR will build the capacity of teachers to work directly with agricultural literacy groups in their states to deliver immersive events similar to the national On The Farm STEM events as well as develop the skills of educators to deliver professional development around beef-funded education materials at their local or regional education centers, creating a system in which state agricultural literacy groups could take the lead in planning and executing these types of events and could rely on “beef-trained” teacher facilitators.

Tactic A is built around three pillars: Professional Development, Education Resources, and Partnerships. Throughout all three categories, this program plans to expand its reach by providing the resources and materials needed to those facilitating these efforts at the state/local level and preparing teachers to accurately implement science lessons built with context from the beef industry. Efforts in the FY24 AR expand impact with direct teacher and student interactions. Programming continues to extend its reach as this program includes virtual and in-person learning experiences as well as e-learning opportunities.

The Need

The need to provide support and resources to educators that present scientifically accurate, unbiased messaging about the science of beef production is at an all-time high. Teachers and students are receiving information from educationally trusted sources that do not represent agriculture accurately or in a balanced way, and beef production might be the target of the misinformation.

As the Next Generation Science Standards (NGSS) and K-12 Framework are implemented in 44 states across the country, science teachers face a new educational landscape in which they must alter or rewrite their curricula. This new direction from the NGSS requires teachers to connect students with more tangible, real-world contexts. Agriculture continues to prove it is a useful context for science education in this regard. However, as teachers turn toward the internet for information when designing lessons, they are faced with sorting through misinformation and propaganda from various groups pushing agendas.

Furthermore, NGSS requires teachers to approach challenging topics such as climate change and sustainability. Teachers and students are receiving information from educationally trusted sources that do not represent agriculture accurately or in a balanced way, and beef production is often the target of the misinformation. To achieve balance and to ensure the accuracy of information, a concerted effort must be made to engage teachers in the conversation around these topics.

The cattle industry actively uses and implements research, technology, and science to seek solutions toward a sustainable future, and we intend to introduce teachers - and therefore students - to those efforts and concepts. This connection will lead to a deeper understanding and appreciation of the beef industry as current and future consumers become better equipped to sort fact from fiction.

The Proposed Solution

This tactic will continue to focus on strengthening relationships with State Beef Councils (SBCs) to maximize the number of educators and students reached with the program. AFBFA and select teachers from its expansive network will work with SBCs to implement aspects of this initiative to obtain a broader level of participation and further reach of resources. AFBFA will work at a national level to train facilitators that are prepared to lead additional state-level events put on by SBCs and educational partners. AFBFA will work to make these important connections and to support both SBCs and educational entities. This will create more opportunities for teachers to be reached in their own localities and will strengthen connections to key industry leaders. AFBFA proposes the following activities to continue building and supporting a community of science education change-makers:

In-Person Professional Development

1. On The Farm STEM – National Events (1 Event)

Elementary, middle, and high school science teachers and administrators will engage in extensive training on the NGSS and apply their learning through an immersive experience that connects teachers, cattle producers, and industry experts. This national event will serve to grow the pool of educators eligible to join the On The Farm STEM Train-the-Trainer Program (described in number 2). These teachers will work to accomplish the following:

- Gain an understanding of the relevancy of beef production to society and science education.
- Design materials for the On The Farm STEM Open Education Resource (OER) platform, the Food and Agriculture Center for Science Education (The Center). Open Education Resources are classroom materials that are freely available and contain a Creative Commons license, meaning other people have the right to share, use, and build upon a work that has been created. OER materials have been the leading trend in education for a number of years as teachers work toward acquiring more equitable resources.
- Implement and modify materials across their district's science curriculum.
- Create lasting partnerships with education and industry professionals and address common misconceptions about production, animal welfare, sustainability, and more.

2. On The Farm STEM Train-the-Trainer Program

Through the On the Farm STEM Local Affiliate Program, this event will continue supporting the three SBCs (implementing organization) and their educational partners* (facilitation organization) identified in FY 23. These partners have already entered a yearlong program to learn how to facilitate the connections between science and beef production with accuracy and impact. Based on the successful On The Farm STEM program, this initiative is designed to empower state agricultural literacy groups and On the Farm STEM alumni, partnered with SBCs, to host immersive science education events in their own states.

State Beef Councils, along with educational partners, and AFBFA will collaborate to achieve the following results through this initiative:

- Train teachers on NGSS connections and how to contextualize science education through the lens of beef production.
- Produce a facilitator guide that state science education facilitators can use to plan and deliver events.
- Update the On The Farm STEM program website to include login access for implementing and facilitating organizations (e.g. On The Farm STEM program alumni).
- Formalize an instructor-led training that teachers can use when facilitating education and industry connections.
- Educational partners and SBCs deliver 3 state-level On The Farm STEM events.

*Educational partners could include science education facilitators familiar with NGSS, such as local education departments, informal education outreach groups, etc. Science education facilitators would be required to facilitate NGSS context while working closely with their State Beef Council for content and communications accuracy.

3. On The Farm STEM – State Events

This event, delivered by SBCs, introduces science teachers and administrators to the scientific concepts that drive the cattle industry. This immersive experience would link science teachers and influencers directly to beef farmers and ranchers, industry scientists, and other industry experts at the local level. These three On the Farm STEM- State Events will be in addition to the two state events conducted by SBCs that were trained in the FY23 AR. By scaling up this program, this training will build the capacity for more teachers and students to have awareness and understanding of beef production and deliver accurate science experiences in the K-12 classroom, while strengthening connections at the state level. State Beef Councils would be required to implement and meet certain benchmarks of the national On The Farm STEM model to ensure quality and consistency.

Virtual Professional Development

1. “*Science through the Lens of Agriculture*” Webinar Series – Beef Focused

This series of webinars is proposed to feature the materials created by AFBFA as a contractor to the Beef Checkoff. An observation from the FY22 third-party external program review (managed through the Checkoff Evaluation Committee) was that teachers are hungry for more materials and guidance on the implementation of those materials. This series of webinars will promote and support teacher efforts to include beef-funded education materials in their classroom.

Educational Resources

1. Classroom Resources (Lessons, Assessments, Teacher Guides, etc.)

According to the external review of AFBFA programming, 9 out of 10 teachers reported a high interest in obtaining more materials that feature agriculture and beef production as a context for teaching science.* AFBFA will maintain/update existing materials while creating additional beef-science resources, including:

- Iterative improvement of current units of instruction based on user feedback to make them better as a larger scope of students and teachers engage with the beef-science units of instruction. Keeping the units current and improving will ensure better implementation.
- Data from surveys conducted by AFBFA in FY22 demonstrate that 88% of teachers have a high need for the creation of week-long, NGSS, beef-science lessons. AFBFA will create materials to meet that need.
- Although creating and updating learning materials that feature agriculture and beef production has been a part of previous year's proposals, we have seen an increased desire (9 out of 10 teachers) for additional materials beyond what has already been created. By creating and updating additional NGSS curricula teachers and students will have a greater awareness and understanding of the beef industry through education.

- * Prompted by the Beef Checkoff Evaluation Committee – External Program Review Report distributed by CBB Staff

Partnerships

1. Collaborative Partnerships between Beef and Education

This effort continues to connect groups of educators with beef industry experts. These partnerships could include, but are not limited to, teacher support networks, school district partnerships, non-formal educational institutes such as national rangelands and museums, pilot programs, and more. AFBFA is dedicated to continuing efforts to keep educators engaged with beef producers and scientists.

These partnerships not only build trusting relationships but they help in evaluating all components of this programming through feedback, iterations, and test trials; bringing teachers together with the industry allows for honest conversations, further spreading the positive impact the beef industry has not only on the food supply chain but also on society at large.

Communications and Promotions

1. Teaching Association Partnerships

Continue strategic partnerships and promotion within the educational community to target educational influencers and key opinion leaders to broaden the network of people engaging with the beef-science units and professional development opportunities. This will be completed by engaging with the National Science Teaching Association (NSTA), along with direct engagement with district and state curriculum administrators.

2. Volunteer Engagement

Engage and equip volunteers (Farm Bureau members, past On The Farm STEM program participants, Cattlemen's Beef Board and Federation of State Beef Council members, and other organizations) to use beef resources in classroom visits, school engagements, and other promotional efforts. As part of a broader effort to engage local volunteers passionate about ag literacy, AFBFA is committed to equipping volunteers with strategies and tools to use the developed beef resources in classroom visits and administrative meetings and as part of the overall community support movement with educators using beef-science in their curriculum.

Measurable Objectives

Measurable Objective #1

Maintain an average satisfaction score (among participants) of 4 or higher on a 5-point Likert scale for all professional development events.

Measurable Objective #2

At least 80% of participants of professional development events or use Checkoff-funded AFBFA educational materials will report a positive perception of the beef industry.

Measurable Objective #3

Equip at least three State Beef Councils with standardized resources to hold On The Farm STEM immersive state events that engage educators and students on beef production scientific concepts such as animal care, sustainability, and environmental stewardship to increase their understanding and positive perceptions of the beef industry.

Performance Efficiency Measures

General Target Audience:

Educator Reach Goal: 2,500,000
Educator Engagement Goal: 300,000

Key Opinion Leaders:

Key Opinion Leader Reach Goal: 125,000
Key Opinion Leader Engagement Goal: 10,000

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

Checkoff Program Committee(s) to Score This Tactic

Committee(s) to Score This Tactic:

Consumer Trust

Supplemental Information for This AR

1. Please explain changes from the FY23 approved AR:

The focus on expanding SBC connections and providing the resources from a national level to support state-level efforts will ensure better, localized support and implementation.

AFBFA has greatly expanded its virtual offerings in this year's AR. This effort is to support teachers in asynchronous learning opportunities that can be enhanced by state-level agricultural literacy groups and SBCs. This change was made to expand reach at the national level while deepening engagement at the local level.

2. List any proposed vendors/agencies that will be used to complete the work in this AR.

Instructional Design and Project Management: Vivayic, Inc. (Lincoln, NE) www.vivayic.com

3. Will all work with vendors/agencies be competitively bid?

No, this program will leverage an ongoing relationship between AFBFA and Vivayic, Inc. Vivayic's agricultural education experts fulfill the responsibilities of the Foundation Education Director.

4. Please list any relationships between this AR and projects previously funded by the Beef Promotion Operating Committee (BPOC).

This AR extends the reach and impact established through AR1708-CI, AR1606-CI, AR 1509-CI, AR 1921-CI, AR 2021-CI, AR 2121-CI, and AR 2321-CI.

5. If applicable, explain how this AR can be extended by State Beef Councils or other contractors.

State Beef Councils (SBCs) will play a large role in the proposed AR. SBCs will deliver professional development immersive events at the state level. SBCs will lead and assist in the teacher recruitment efforts and event planning. AFBFA will generate support materials for these events and assist in training teachers and SBC personnel to deliver these immersive On The Farm STEM workshops/farm tours.

Potential Partnerships

Please list all potential partners/collaborators for this AR, and 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.

Potential Partnership List:

- | | |
|--|---|
| 1. Cornell University & New York State Extension | 7. New York Beef Council |
| 2. American Farm Bureau Federation | 8. Colorado Beef Council |
| 3. NSTA - National Science Teaching Association | 9. Oklahoma Beef Council |
| 4. WestEd: NextGenScience Team | 10. United States Department of Agriculture |
| 5. National/State Agriculture in The Classroom | 11. Boston University |
| 6. State Departments of Education | 12. Iowa State University |
| • Nebraska | 13. Ohio State University |
| • Louisiana | 14. Northern Illinois University |
| • Washington | 15. Washington State University |
| • Michigan | 16. WA STEM |
| • Colorado | |

Detailed Budget Summary

The tables in the following three sections report program budget information from the following funding sources:

1. Cattlemen's Beef Board/Beef Promotion Operating Committee (CBB/BPOC) Funding
2. "Other Funding" sources such as:
 - Federation of State Beef Councils (FSBC) Funds
 - Individual Qualified State Beef Council (QSBC) Funds
 - Government Funds (e.g., Market Access Program, Foreign Market Development)
 - Grain/Oilseed Funds (e.g., National Corn Growers Association, American Soybean Association)
 - Corporate Funds (e.g., tech and pharma companies)
 - Other

Section 1 - Funding Requested by Tactic

CBB/BPOC Funding Requested by Tactic

The following table outlines the amount of CBB/BPOC funding that is being requested for each tactic within this AR, and the committee(s) that has been selected to score each tactic.

CBB/BPOC Funding Requested by Tactic					
Committee Name	Tactic	Tactic Name	Direct Costs	Implementation	Total
Consumer Trust	Tactic A	Immersive professional development and accurate science education materials for STEM educators	\$680,000.00	\$120,000.00	\$800,000.00
		Total	\$680,000.00	\$120,000.00	\$800,000.00

Other Funding Sources Requested by Tactic

The following table reports the amount of proposed and/or anticipated "Other Funding" sources that would be applied to this AR's tactics. The funding information in this table is for informational purposes only and demonstrates external collaboration as delineated in the 2021-2025 Beef Industry Long Range Plan.

Other Funding Sources Requested by Tactic (Informational Only)			
Funding Source	Tactic	Tactic Name	Total
Other: American Farm Bureau Foundation for Agriculture	Tactic A	Immersive professional development and accurate science education materials for STEM educators	\$10,000.00
Other Funding Total			\$10,000.00

Use the space below if you wish to provide additional comments/information on the FY24 CBB/BPOC or Other Funding amounts that are being requested for this AR's tactic(s).

The American Farm Bureau Foundation maintains the My American Farm online game platform, on which two Checkoff-funded games are housed. The Foundation also maintains the Food and Agriculture Center for Science Education, on which Checkoff-funded educational materials and professional development opportunities are promoted. The Foundation expects to expend \$10,000 of its funds to maintain these two sites.

Section 2 - Summary of FY23 AR Budgets and Expenses

Classification:

This AR is a continuation of, or builds upon, program work from last year. CBB will report information in the "FY23 CBB/BPOC Funding" table and we will provide information for the "FY23 Other Funding Sources" table.

FY23 CBB/BPOC Funding

This table reports the amount of awarded and expended CBB/BPOC funding for this Authorization Request in FY23.

FY23 CBB/BPOC Funding

Note: The Cattlemen's Beef Board will complete the fields in this table.

	AR# 2321-CI		
	Direct Costs	Implementation	Total
Funds Awarded	\$810,000.00	\$90,000.00	\$900,000.00
Actual Expenses (October 1, 2022 - June 30, 2023)	\$400,813.00	\$57,497.00	\$458,310.00

FY23 Other Funding Sources

The following table reports the amount of committed and expended "Other Funding" sources for this AR in FY23. The funding information in this table is for informational purposes only and demonstrates external collaboration as delineated in the 2021-2025 Beef Industry Long Range Plan.

FY23 Other Funding Sources (Informational Only)

	AR# 2321-CI		
	Other Funding Source	Funds Committed	Funds Expended (October 1, 2022 – June 30, 2023)
A	Other: Dairy Management Inc.	\$37,000.00	\$32,000.00
B	Other: American Farm Bureau Foundation for Agriculture	\$10,000.00	\$5,000.00

Use the space below if you wish to provide additional comments/information on the FY23 CBB/BPOC or Other Funding budget and expense summaries.

Dairy Management, Inc. is providing funding for an On The Farm STEM program similar in scope to the On The Farm STEM program funded by the Beef Checkoff. By co-promoting the two programs through paid social media, at conferences such as the National Science Teaching Association conference, and professional development opportunities presented through AFBFA's Food and Agriculture Center for Science Education, we have been able to gain greater leverage to reach more educators for the programs described in this AR.

The American Farm Bureau Foundation maintains the My American Farm online game platform, on which two Checkoff-funded games are housed. The Foundation also maintains the Food and Agriculture Center for Science Education, on which Checkoff-funded educational materials and professional development opportunities are promoted. The Foundation expends approximately \$10,000 of its funds per year to maintain these two sites.

Section 3 - Historical Summary of AR Budgets and Expenses

Classification:

This AR is a continuation of, or builds upon, program work from the last two years (or longer). CBB will report information in the "CBB/BPOC Historical" table, and we will provide information for the "Other Funding Sources Historical" table.

CBB/BPOC Funding – Historical Summary

The following table reports the amount of awarded and expended CBB/BPOC funding for this AR in FY20, FY21, and FY22.

CBB/BPOC Funding - Historical Summary

Note: The Cattlemen's Beef Board will complete the fields in this table.

		FY22 AR# 2221-CI	FY21 AR# 2121-CI	FY20 AR# 2021-CI
AR Period¹	<i>Start Date:</i>	<i>Oct. 1, 2021</i>	<i>Oct. 1, 2020</i>	<i>Oct. 1, 2019</i>
	<i>End Date:</i>	<i>Sep. 30, 2022</i>	<i>Dec. 31, 2021</i>	<i>Sep. 30, 2020</i>
Funds Awarded		\$926,000.00	\$670,996.00	\$698,300.00
Actual Expenses²		\$895,344.00	\$575,514.00	\$630,176.00

¹For multiyear ARs, the "End Date" reflects the date that the AR is scheduled to be completed.

²If the AR "End Date" has not year occurred, actual expenses will be reflective of the following time period:
AR Start Date - June 30, 2023

Other Funding - Historical Summary

The following table reports the amount of "Other Funding" source expenditures for this AR in FY20, FY21, and FY22. The funding information in this table is for informational purposes only and demonstrates external collaboration as delineated in the 2021-2025 Beef Industry Long Range Plan.

Other Funding Sources – Historical Summary (Informational Only)

	FY22 AR# 2221-CI		FY21 AR# 2121-CI		FY20 AR# 2021-CI	
	Other Funding Source	Total Expenditures	Other Funding Source	Total Expenditures	Other Funding Source	Total Expenditures
A	Other: American Farm Bureau Foundation for Agriculture	\$11,789.00	Other: American Farm Bureau Foundation for Agriculture	\$6,000.00	Other: N/A	
B	Other: Dairy Management Inc.	\$2,250.00				

Use the space below if you wish to provide additional comments/information on the historical CBB/BPOC or Other Funding budget and expense summaries.

FY22: AFBFA created and launched the Food and Agriculture Center for Science Education (The Center) to showcase our resources and professional development opportunities for science educators. The curricula, resources, and professional development created and offered with funding from the Beef Checkoff are prominently featured on this site. AFBFA use its own funds to create the site and create a brochure to promote the site. The site and brochure cost a total of \$11,789.

With the addition of an On The Farm STEM program funded by Dairy Management Inc. (DMI), DMI paid for a banner ad on the National Science Teaching Association website to encourage applications for the program. This elevated the profile of the On The Farm STEM program focused on beef. The cost of the banner ad was \$2,250.

FY21: AFBFA spent \$6,000 of its own funds for the early development of the Food and Agriculture Center for Science Education platform, which features Checkoff-funded resources and professional development.