Awards issued prior to January 20, 2025, were funded under previous Administrations and may not reflect the priorities and policies of the current Administration.

United States Department of Agriculture
Project Initiation

Project Data for Accession Number 1034534

Project Title

Stable to STEM: Translational Undergrad Equine Science Research and Extension Opportunities to Train and Retain Interest in Animal Science

Project Details

Sponsoring Institution National Institute of Food and Agriculture	**Project Status** ACTIVE
Funding Source NIFA Non Formula	**Grant Year** 2026
Grant No. 2026-67037-46155	**Cumulative Award Amt.** $750,000.00
Proposal No. 2024-09053	**Multistate No.** (N/A)
Project Start Date Aug 15, 2026	**Project End Date** Aug 14, 2031
Program Code [A7401] Research and Extension Experiences for Undergraduates	

Project Director

Wulster-Radcliffe, M.

Recipient Organization

UNIVERSITY OF KENTUCKY RESEARCH FOUNDATION, THE

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Performing Department

(N/A)

Non Technical Summary

Stable to STEM (S2S) is a five-year undergraduate education and research program designed to attract and support students interested in animal science by using horses as an engaging entry point into STEM careers. Horses are a species that naturally draw strong student interest, and S2S will use this interest to introduce students to research, education, and outreach careers that improve animal health, agriculture, and food systems.Through hands-on experiences, students will learn how science is used to solve real-world problems. Participants will gain practical skills in research, teamwork, leadership, and communication while working alongside faculty mentors and industry professionals. The program will also emphasize sharing scientific knowledge with agricultural stakeholders and the public, helping students understand how research moves from the laboratory to everyday use.S2S will create a learning environment that builds scientific literacy and encourages long-term involvement in animal science and

related STEM fields. By combining research, mentorship, and outreach, the program aims to strengthen the future workforce needed to support agriculture and animal health.The overall goal of S2S is to use the University of Kentucky's strong, collaborative equine research community to provide high-quality undergraduate training, mentorship, and scholarship in animal sciences. The program is designed to spark lasting interest in research and extension careers and to support students as they explore professional pathways in science and agriculture.To achieve this goal, S2S focuses on three core objectives:Training: Provide students with introductory education in scientific concepts, laboratory practices, animal care, data interpretation, communication skills, and outreach. Mentorship: Support students through close mentoring relationships with experienced faculty and extension professionals.Research: Engage students in meaningful research and extension projects that address real-world challenges in animal agriculture.Program outcomes will be evaluated using surveys and feedback collected before, during, and after participation to understand student learning, experiences, and career interests.

Animal Health Component

Animal Health Component: 100%

Research Effort Categories

Basic	0%
Applied	100%
Developmental	0%

Classification

Knowledge Area (KA)	Subject of Investigation (SOI)	Field of Science (FOS)	Percent
305	3810	3020	100%

Knowledge Area

[305] Animal Physiological Processes

Subject Of Investigation

[3810] Horses, ponies, and mules

Field Of Science

[3020] Education

Keywords

STEM, metabolism, nutrition, physiology, undergraduate research

Goals / Objectives

To create and retain interest and to influence student success in animal sciences programs, we are proposing Stable to STEM (S2S), a 5-year, multi-departmental, translational undergraduate research program highlighting the horse and nutritional science, a species of high interest to students (8 students per year for a total of 40 total students) and an integrated topic that teaches high level scientific concepts that will enhance scientific career readiness. Students

having completed their second or third year of undergraduate will be recruited nationwide or from our partners: Lincoln Memorial University, Kentucky State University and Bluegrass Community and Technical College. Creation and implementation of S2S will allow us to achieve our overall goal to leverage UK interdepartmental, translational horse research program to create an undergraduate research and extension program to provide quality training, mentorship, and student scholarship in animal sciences to develop robust, life-long, sustainable research and extension interest.To accomplish our Overall Goal, we will pursue the following objectives:Training: To educate and provide introductory training to academic career students on the following topics: scientific concepts and terminology, laboratory basics, animal care and use, statistics, communication, scholarship, and extension.Mentorship: To provide mentorship to students by assigning each student a primary research and/or extension mentor.Research: To increase students' research self-efficacy and identity and belonging to animal science.

Project Methods

Stable to STEM (S2S) is a five-year, multi-departmental undergraduate research and extension training program designed to recruit, engage, and retain students in animal sciences and related STEM fields using equine nutrition as a high-interest, translational gateway discipline. The program will support 8 students per year for five cohorts (40 total students), emphasizing interdisciplinary research, mentorship, and extension scholarship. Students will be recruited nationally and through institutional partners,with at least 50% of each cohort drawn from outside the University of Kentucky (UK).Equine nutrition provides an ideal translational research platform for undergraduate education. Students apply foundational biology and chemistry concepts to real-world questions related to animal health, forage systems, metabolism, microbiology, and immune function. Because nutritional principles studied in horses readily translate to other livestock species, the horse serves as a "gateway species" to broader agricultural and food system sciences. The interdisciplinary nature of equine nutrition--integrating animal science, plant and soil science, veterinary medicine, biochemistry, and agricultural economics--offers students a holistic and applied STEM learning experience. Overall project management and budget oversight will be led by the Co-PIs, Drs. Wulster-Radcliffe and Urschel. Dr. Hanley will oversee program evaluation. A multidisciplinary team of research and extension mentors from Animal and Food Sciences, Veterinary Science, and Plant and Soil Sciences will deliver training and mentorship. All mentors are affiliated with the UK Equine Science and Management (ESM) program and have demonstrated records of undergraduate mentorship, scholarly productivity with undergraduates, and student career development.The Co-PIs will develop the 9-week curriculum and coordinate all translational research and extension activities. Student management and communications will be shared among PIs and mentors to ensure cohort cohesion and positive mentoring experiences.The program will recruit its first cohort in September 2026, with the first 9-week residential experience in Summer 2027. One cohort will be completed each year for five years.Eligible participants include undergraduate students who have completed their second or third year of study and intend to continue toward a degree. Recruitment will begin each September through three primary pathways:Applications will be submitted via a secure UK OUR platform and include a personal statement, résumé, transcripts, and two letters of recommendation. Selection will prioritize academic readiness, motivation, and diversity of background. A waitlist will be maintained.S2S consists of a 9-week, in-residence summer program integrating training, mentorship, research, and extension. Orientation: Students receive program and safety orientation, facility and farm tours, and industry exposure. Individual training plans and required certifications (e.g., IACUC, lab safety) will be initiated.Academic and Cohort Training: Weekly cohort meetings provide instruction in research methods, data analysis, ethics, and extension communication while fostering cohort cohesion. The final two weeks focus on synthesis, presentation preparation, and extension product development.Research Experience: Each student is paired with a faculty mentor and embedded in an active research program. Students participate in study design, animal care, sample collection, laboratory analysis, data interpretation, and presentation. Weekly peer discussions reinforce interdisciplinary learning and communication skills. Industry and Extension Engagement: Weekly site visits to equine farms and related industries reinforce translational science concepts, expose students to science-based career pathways, and support extension skill development.Each student receives intensive short-term and sustained long-term mentorship from faculty, graduate students, and research staff. Mentors will define achievable projects, meet regularly with students, and support increasing independence. Monthly virtual mentoring meetings will continue during the academic year following the residency.

United States Department of Agriculture
Project Initiation

Mentors will participate in two 2-hour training sessions covering curriculum goals, mentoring strategies, and professional conduct. Mentors will establish clear expectations using a signed undergraduate research contract, expose students to the full research process, foster resilience, encourage independence, and address professional development. All mentors will comply with UK ethical conduct policies and safety training requirements.Students will complete two tangible products:A 3-minute research poster presentation suitable for adaptation to professional conferences.A single extension or outreach product (e.g., factsheet, social media, web resource) translating research to stakeholder audiences.A mixed-methods evaluation will assess program effectiveness relative to objectives. Formative evaluation will occur through ongoing meetings with leadership and instructional teams, while summative evaluation will integrate annual quantitative and qualitative data from students, mentors, and stakeholders.Evaluation questions address student learning, mentoring effectiveness, cohort diversity, research self-efficacy, program barriers, scalability, and integration of research and extension. Data will be collected using validated or adapted instruments administered via Qualtrics, analyzed using MAXQDA and R, and managed in compliance with IRB requirements. Annual summative reports will guide continuous improvement.