American Association of Extension Veterinarians
22nd Annual Applied Animal and Public Health Research and Extension Symposium

3:00PM – 6:00PM (Central US Time) Sunday, October 18, 2026

Location: Hall of Ideas EH

Chairs: Drs. Kathy Whitman and Chloe Stenkamp-Stram

AGENDA

3:00pm-3:05pm	**Introduction to the AAEV Symposium** Carla Huston, AAEV Treasurer
3:05pm-3:15pm Presentation 3:15pm-3:20pm Q&A	**Capacity building to improve biosecurity and reduce disease spread in diversified small-scale farms in California -** Roselle Busch
3:20pm-3:30pm Presentation 3:30pm-3:35pm Q&A	**Illuminating antimicrobial stewardship through field necropsies -** Craig McConnel
3:35pm-3:45pm Presentation 3:45pm-3:50pm Q&A	**New World Screwworm Reference and Education Materials for Veterinary Practitioners, Animal Shelters, and Pet Owners -**Amanda Sorensen
3:50pm-4:00pm Presentation 4:00pm-4:05pm Q&A	**National Animal Health Monitoring System Backyard Animal Keeping Study 2024: National and City Survey Results Overview –** Andrea Beam
4:05pm-4:15pm Presentation 4:15pm-4:20pm Q&A	**Veterinary Students and Farm Safety: An Online Training Module for Veterinary Students and Practicing Professionals –** Gillermo Arcega Castillo
4:20pm-4:40pm	**Break-Virtual Poster Slide Show**
4:40pm-4:50pm Presentation 4:50pm-4:55pm Q&A	**Using systems thinking to model worker biosecurity behavior in U.S commercial layer systems: opportunities for extension support –** Sharon Samuel
4:55pm-5:05pm Presentation 5:05pm-5:10pm Q&A	**Feedyard caregiver perspectives on cattle euthanasia decision-making: A pilot survey –** Emiline Sundman
5:10pm-5:20pm Presentation 5:20pm-5:25pm Q&A	**What Do Veterinarians Want from Extension? –** Angela Varnum
5:25pm-5:35pm Presentation 5:35pm-5:40pm Q&A	**The Cost of New World Screwworm for Beef Cattle Producers by Cattle Class, Control Zone, and Fly Season Length –** Amy Hagerman
5:40pm-5:50pm Presentation 5:50pm-5:55pm Q&A	**Stakeholder perspectives on biosecurity adoption in the Colorado cattle supply chain: Lessons from foot-and-mouth disease preparedness –** Tais Menezes & Emilia Ravetta
5:55pm-6:00pm	**Meeting Wrap-Up**

We look forward to you joining us at the 23rd Annual AAEV Symposium October 2027 in Providence, RI!

Capacity building to improve biosecurity and reduce disease spread in diversified small-scale farms in California

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The rise of diversified small-scale farms (DSSF) in the U.S. reflects growing consumer demand for sustainably produced food. However, managing multiple livestock species and/or crops within the same operation creates unique challenges for implementing effective disease prevention and biosecurity practices. Recent studies conducted in the western U.S. reported significant gaps in DSSF access to veterinary services, biosecurity knowledge, and educational resources. Few outreach programs have been developed specifically to assess the biosecurity needs of DSSFs and translate those needs into tailored and practical resources. To address these gaps and challenges, we developed an outreach project in collaboration with six farm advisors from the University of California Agriculture and Natural Resources (UC ANR), representing different regions across California. The objectives of this project are 1) identify barriers to biosecurity adoption among DSSF through surveys targeting small scale farmers raising multiple livestock species, youth agricultural programs (FFA, 4-H), and crop-livestock operations, 2) develop and deliver biosecurity outreach based on identified needs through a dedicated website (FARM PPE: https://farmppe.netlify.app/), webinars, and in-person activities, biosecurity demonstrations, and developing customized farm biosecurity plans including mapping, and 3) develop a train-the-trainer program – a new extension resources for veterinarians, extension professional and other agricultural educators - to strengthen preparedness for disease outbreak, disaster, and foreign animal diseases. This program will equip these trainers to train and educate their own farming communities. Ultimately, this project aims to enhance animal health, reduce disease transmission risks, and strengthen veterinary outreach capacity for underserved small-scale farm communities.

Illuminating antimicrobial stewardship through field necropsies

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Although widely used in human health systems, antibiograms (collections of antimicrobial susceptibility data for particular bacteria and host species) are not often available in veterinary medicine. Similarly, livestock veterinarians are well aware that field necropsies can provide insight into underlying issues related to animal health and welfare, but their utility can be overlooked without a direct application of findings. An integrated approach to end-of-life assessments inclusive of antibiograms sets the stage for improved antimicrobial stewardship (AMS) and better farm management overall.

Our core stakeholder audience of livestock veterinarians have indicated that they 1) *want* to incorporate new services such as postmortem evaluations into routine management as a means for tying together loose diagnostic and therapeutic ends and improving AMS, but 2) *need* help demonstrating the value of the service through research that "is based on what actually happens on farms, not what people think should happen on farms." That is a reasonable expectation that forms the basis for this project's goal to demonstrate the development and application of a Veterinary Medicine Extension program of education that provides adult learners autonomy to develop effective tools based on personal experience, creative problem solving, and strategic planning.

Our project integrates veterinary students during their final clinical year into the provision of field necropsies as a first step toward establishing foundational technical needs for livestock-focused and mixed-species practitioners. Student input and involvement will help guide the performance of field necropsies of dairy and beef cattle to demonstrate the utility of necropsy protocols and death certificates to track underlying and proximate causes of death. This will generate data to establish regional livestock antimicrobial resistance patterns through the creation of antibiograms based on given antimicrobial drug/bacterial species/animal host combinations. Overall, this will serve as a model for the development of an Extension program focused on the tenets of needs assessment, program design, program implementation, and evaluation. The value of demonstrating a process for creating a coherent Veterinary Medicine Extension program that develops these tools is warranted and arguably overdue.

New World Screwworm Reference and Education Materials for Veterinary Practitioners, Animal Shelters, and Pet Owners

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New World screwworm (NWS) (*Cochliomyia hominivorax*) returned to the United States in June 2026, six decades since its eradication from the U.S. Although Arizona has no confirmed cases as of August 2026, its proximity to affected regions and the routine cross-border movement of livestock, pets, and wildlife place the state at significant risk for introduction of NWS. Initial federal and state guidance has targeted livestock producers and food animal practitioners. While comprehensive, these resources are often highly technical, limiting their accessibility and practical use for many stakeholders. In addition, few resources specifically address companion animals, despite confirmed canine infestations. Because most veterinarians, shelter/rescue workers, and pet owners have never encountered NWS, tailored resources with clear, step-by-step guidance for recognizing, reporting, and responding to cases are urgently needed.

To meet this need, the University of Arizona College of Veterinary Medicine has developed NWS reference and education materials to reach multiple audiences including livestock and companion animal veterinarians, pet owners, and shelter/rescue workers. Spanish-language versions for all materials are currently in development to reach the large and critical workforce, clientele, and communities throughout border regions and nationwide.

Companion animal and large animal veterinary resources present a stepwise algorithm that leads each target group from screening and identification through response complete with diagnostic images, life cycle information, reporting contacts, euthanasia considerations, and human exposure guidance. Embedded QR codes link to state animal health officials, diagnostic laboratories, approved products, and federal resources. The materials are available in a poster or desk reference format for easy access in a clinic or field setting. Pet owner and shelter/rescue posters include simplified step-by-step guidance on what to look for, where to look, steps to take if NWS is suspected, links to comprehensive resources, and a call to action to protect our communities.

All materials are available nationally through the University of Arizona Cooperative Extension website. This outreach initiative aims to empower communities at greatest risk of NWS infestation to serve as the front line of surveillance and response, enhancing early detection and safeguarding human, animal, and environmental health nationwide.

Supported by the United States Department of Agriculture.

National Animal Health Monitoring System Backyard Animal Keeping Study 2024: National and City Survey Results Overview

V. Fields, A. Green, R. McGuigan, B. Danek, A. Beam

Center for Epidemiology and Animal Health, Animal and Plant Health Inspection Service, United States Department of Agriculture

Introduction

The USDA's National Animal Health Monitoring System (NAHMS) Backyard Animal Keeping 2024 Study included two components: a national survey and a city survey. The national survey provided estimates on the percentage of adults who kept poultry, pigs, goats, or rabbits at their home or property (or community coop for poultry). Participants who kept any of the four species were asked to answer questions on animal management and biosecurity practices, including veterinarian use, where animals were obtained, where animals were kept at the home, and information sources used. The city survey estimated the percentage of households that own chickens, pigs, goats, or rabbits in Denver, Colorado, and Miami, Florida, and was a follow up to the NAHMS 2010 Urban Chicken study.

Methods

The national survey was carried out using the AmeriSpeak survey panel at NORC at the University of Chicago, which was supplemented by an opt-in panel to increase responses by animal owners. The city survey used an address-based sample and was multi-modal.

Results

The national study had responses from 760 backyard animal keepers and 901 adults who did not keep backyard animals. Overall, 6.7 percent of U.S. adults reported keeping any poultry, 1.5 percent kept pigs, 1.3 percent kept goats, and 2.8 percent kept rabbits, and 9.6 percent of adults kept any of these four animal types. Overall, 25.7 percent of adults who kept poultry, 57.4 percent of adults who kept pigs, 44.2 percent of adults who kept goats, and 41.5 percent of adults who kept rabbits used the services of a veterinarian for their animals in the past 12 months. The city survey had 1,347 respondents from Denver and 848 from Miami. For the two cities, a higher percentage of adults (2.5 percent) owned chickens than any of the other three species (0.5 percent of adults owned pigs, 0.4 percent owned goats, and 1.3 percent owned rabbits).

Conclusion

This study helps to improve our understanding about backyard animal keeping and provides information on owner knowledge gaps, opportunities for outreach, as well as animal health and

management practices used. Descriptive reports and informational sheets/infographics are published or forthcoming.

Veterinary Students and Farm Safety: An Online Training Module for Veterinary Students and Practicing Professionals

JB Bender[1,2], A LimBybliw[2], GA Castillo[3], S Godden[1], D Charlier[2]

[1]Upper Midwest Agricultural Safety and Health Center (UMASH), [2]School of Public Health, University of Minnesota), [3]Center for Animal Health and Food Safety,[4]College of Veterinary Medicine, Department of Veterinary Population Medicine,

Objective: Veterinary students entering large animal externships and practicing professionals working in agricultural settings face significant occupational risks, yet farm safety training is often limited in veterinary curricula. This module prepares veterinary students to recognize hazards on farms, take precautions, and serve as a resource to protect themselves, producers, and workers.

Methods/Program Description: The module, "Introduction to Veterinary Medicine Farm Safety," was developed with content experts in agricultural safety and veterinary medicine. The self-paced, online format covers four core areas: (1) farm hazards and equipment safety, (2) farm injury prevalence and emergency management, (3) farm animal safety and handling, and (4) zoonotic disease prevention and biosecurity planning.

Results/Status: The module will be offered to all University of Minnesota veterinary medicine students and to all U.S. veterinary schools free of charge to support the safety of students working in large animal practice. Ongoing evaluation of its effectiveness and learner feedback will inform future revisions to keep content current and responsive to the needs of students entering bovine practice.

Discussion/Implications: This module addresses a critical gap in veterinary education by providing accessible, standardized farm safety training grounded in UMASH's One Health approach, which recognizes the connections between human, animal, and environmental health in agricultural settings. By equipping future and current practitioners to recognize and mitigate agricultural hazards, this resource has the potential to reduce injury rates and improve occupational safety among veterinarians working in food animal practice and their clients.

Abstract

Using systems thinking to model worker biosecurity behavior in U.S commercial layer systems: opportunities for extension support

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Background: Commercial table-egg farms are highly vulnerable to highly pathogenic avian influenza (HPAI), and preventing entry into farms and barns requires consistent implementation of biosecurity practices by workers. While research has identified risk factors, these factors are often studied in isolation. Moreover, studies on the behavioral influences on biosecurity compliance are limited in the U.S commercial layer system.

Objective: To identify feedback interactions between human behavior and biosecurity bypass within a commercial table-egg farm with the aim of identifying opportunities for extension intervention.

Method: Evidence from published studies and our current understanding of the system was used to identify behavioral factors contributing to biosecurity bypass. A Causal Loop Diagram (CLD) was utilized to model the identified factors and their causal relationships. The model assumed environmental HPAI load as a boundary condition while focusing on worker-mediated pathways that may modify the likelihood that exposure to the virus results in virus introduction. Vensim® DSS, a specialized software package for system dynamics modeling, was used to build the model.

Results: Five balancing loops (B1 -B5) and one reinforcing loop (R1) were identified in the CLD. Feedback indicates that a state of no outbreaks may increase threat salience and management requests for education, creating an opportunity for veterinary and extension engagement before an

outbreak by increasing worker-perceived self-efficacy and reducing protocol bypass. Specifically, the CLD identifies an outbreak prevention pathway in which worker-tailored biosecurity education improves comprehension, reduces execution difficulty, supports routine practices such as vegetation management, reduces the presence of wildlife and pests, and strengthens perceived self-efficacy, thereby reducing anxiety-associated protocol bypass. The reinforcing pathway suggests that an increase in outbreak-associated workload and time pressure reduces willingness to learn, increases apathy, reduces attention to biosecurity procedures and increases biosecurity execution difficulty, which increases protocol bypass.

Conclusion: Extension support may be more valuable before an outbreak occurs, during heightened HPAI concern. Conversely, comprehension and implementation of educational materials may decline due to the workload associated with an outbreak. The model offers a framework for the development of targeted Extension strategies to counter HPAI in commercial table-egg systems.

Feedyard caregiver perspectives on cattle euthanasia decision-making: A pilot survey

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In feedyards, timely euthanasia of cattle with poor prognoses are difficult but critical decisions with significant animal welfare implications. Yet, little information is available regarding feedyard caregiver perspectives on euthanasia decision-making. The aim of this pilot study was to characterize feedyard caregiver perspectives on euthanasia decision-making and implementation. A convenience sample of feedyard caregivers were invited to participate in an in-person survey. Eleven participants from eight Midwest feedyards were enrolled. Male (8) and female (3) participants were employees (3), managers (3), owners (3) or veterinarians (2) associated with the feedyard. All but one participant had >5 yrs experience in their role and all but 3 had received formal cattle euthanasia training. Overall, participants expressed confidence in euthanasia decision-making and performance. Despite this, some open-response answers highlighted a possible disconnect between reported confidence and decision-making in specific scenarios that is worth further investigation. Six respondents reported stress related to euthanasia decision-making, with “I find it difficult to end the life of an animal” and “I worry that the first attempt will not be successful” as top concerns. When asked why euthanasia was important for cattle management, the most frequent keywords were “pain and/or suffering” (10 respondents), “likelihood of recovery” (7 respondents), “quality of life” (3 respondents), and “time/resource costs” (3 respondents). Consistent with these responses, participants most frequently rated obvious pain/suffering (8 respondents), likelihood of recovery (8 respondents), and condition severity/duration (6 respondents) as "extremely important" euthanasia decision-making criteria. When asked about five specific conditions, broken legs were ranked as the easiest condition for euthanasia decision-making, followed by brainer conditions, and non-responsive BRD and non-weight-bearing/non-responsive lameness were tied for third. These preliminary results suggest that surveyed caregivers were generally confident in euthanasia decision-making and considered animal welfare factors. The lack of inexperienced participants is a study limitation. Future work should investigate whether responses differ in less experienced caregivers, as well how well reported confidence aligns with decisions in specific scenarios. These findings provide initial information that may inform future cattle euthanasia training and extension efforts.

What Do Veterinarians Want from Extension?

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Beef and dairy veterinarians experience quality-of-life challenges due to workload and after-hours calls, which contribute to burnout. Extension services are obligated to provide outreach programs that address these needs for both livestock producers and veterinarians.

As part of a needs assessment, a survey of Minnesota large and mixed animal practitioners identified key client education areas desired from Extension, specifically regarding emergency skills and needs of new bovine and small ruminant producers.

A 27-question survey was conducted via Qualtrics with the Minnesota Veterinary Medical Association in May-June 2026. Out of 860 recipients, 116 responses were recorded, and 80 eligible practitioners in MN (mixed/large animal practitioners employed in the veterinary profession) completed the survey.

Top skills which bovine veterinarians desired of their clients were safely restraining the animal, identifying a malpresentation during a dystocia, and administering basic injections (SQ or IM) safely. Top skills which veterinarians desired of their small ruminant clients were checking mucous membrane color (FAMACHA scoring), administering basic injections (SQ or IM) safely, and identifying an animal in labor. Examples of practices which veterinarians wished Extension would influence their clients to do included record-keeping, providing species-specific nutrition, consulting DVMs on management, calling when a problem is first noticed, and small ruminant husbandry/basic skills.

Extension can proactively address husbandry issues alongside veterinarians in private practice, strengthening the veterinarian-client-patient relationship and reducing the emergency burden caused by unprepared clientele.

The Cost of New World Screwworm for Beef Cattle Producers by Cattle Class, Control Zone, and Fly Season Length.

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Cattle production practices and veterinary health tools have evolved since the last widespread incursion of new world screwworm (NWS) that lasted from the 1960s into the early 1980s. Limited nearby infestations near detections in Texas and New Mexico in 2026 likely reflect advancements in detection, communication, treatment, and prevention. However, NWS is now endemic throughout Mexico and Central America, as the barrier at the Darién Gap that held for four decades will take time and effort to regain. Producers want to know the cost of operating under a higher risk of repeated incursions that is likely to last for years. Actual costs from 2026 have not been published, but previous estimates of NWS cost ($732.6 million in 2024 dollars) are based on a uniform cost per head. Most producers will incur prevention and compliance costs rather than widespread infestation costs based on ranch level conditions, which highlights a need for new economic cost estimates.

This presentation offers extension veterinarians a cost that is built from the ranch up. We price the medication, labor, and facilities a producer would need under both surveillance and infestation statuses, by cattle class, scaled by how many months of the year the local climate allows a complete fly life cycle. The result is a per-head monthly figure a producer can multiply by herd size a county's fly season length. We hold management practices to observed levels for different types of operations using a 2022 Cow-Calf Biosecurity Survey.

Preliminary results highlight that labor is the largest cost, and a limiting factor for medium sized producers. We also find a need to calibrate expectations on producer demands to local operational norms, fly season length, and management practices. The timing of wounding activities matters. In Oklahoma, only 14% of calves were born in high fly risk months but 63% of male calves were castrated in high fly risk months. If temporary facilities must be put in place, costs for the producer expands by almost 20%. These results help move impacts past a general economic cost for an industry to tangible farm-level cost for producers and the veterinarians they work with.

Stakeholder perspectives on biosecurity adoption in the Colorado cattle supply chain: Lessons from foot-and-mouth disease preparedness

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An incursion of foot-and-mouth disease (FMD) into the United States would trigger movement restrictions, disrupt supply chains, and impose severe economic losses across the livestock sector. Continuity-of-business frameworks such as the Secure Beef Supply Plan depend on voluntary adoption of biosecurity measures before an outbreak occurs. However, preparedness depends not only on technically effective measures but also on whether practices are practical, trusted, and sustainable across the cattle supply chain. We asked: what would make biosecurity feasible for Colorado cattle operations before an emergency occurs?

We used a two-phase, stakeholder-engaged qualitative design. Between November 2024 and July 2025, we conducted 12 focus groups and 18 individual interviews with 75 participants representing cow-calf and stocker operations, dairy production, feedlots, processing/packing facilities, sale barns, brand inspection, veterinarians, and Extension. In early 2026, four cross-sector workshops engaged 56 participants in voting on biosecurity practices by feasibility, impact, and urgency and identifying system-level "critical shifts" needed to improve preparedness. In total 110 stakeholders participated. Transcripts were thematically and openly coded, and workshop voting and discussion outputs were synthesized across locations.

Participants generally viewed FMD as a low-priority but high-consequence threat. Time, labor, cost, operation size, geography, seasonality, traceability burdens, and limited veterinary access constrained adoption, while stakeholders preferred concise, action-oriented tools over complex plans. Local veterinarians, Extension agents, and brand inspectors were identified as trusted messengers. Uncertainty about reporting consequences and skepticism toward top-down mandates could undermine cooperation. In workshops, visitor/vendor hygiene and controlled access received the most feasibility votes. Quarantining new or returning animals were identified as the most impactful and urgent measures. Cleaning and disinfection for service providers and transport vehicles also ranked highly for impact, while knowing source-herd disease status ranked highly for urgency. Participants also prioritized stronger cross-sector communication and clearer outbreak protocols.

These findings suggest that FMD preparedness may be strengthened by pairing low-burden everyday biosecurity practices with targeted financial and technical support for more demanding measures, delivering guidance through trusted local messengers, and establishing cross-sector communication protocols before an emergency occurs. Overall, these findings highlight practical opportunities to improve preparedness and reduce the potential impacts of FMD outbreaks.