

**Board Research Initiative
Request for Proposals**

On-Farm Poultry Depopulation Using Nitrogen

Background

Whole-house nitrogen gas depopulation and nitrogen-infused foam depopulation have emerged as a potential emergency depopulation method for commercial poultry during outbreaks of highly pathogenic avian influenza (HPAI), foreign animal diseases and other emergency scenarios. While the use of nitrogen for both methods offers the potential to reduce labor requirements, improve health and safety parameters for farm staff and first responders, minimize live bird handling and accelerate the efficiency and effectiveness of mass depopulation of poultry flocks, additional research is needed to validate its effectiveness under commercial conditions. Specific research is needed to identify best management practices, optimize application parameters, evaluate bird welfare outcomes, assess operational feasibility and determine the practicality of implementing this technology across various poultry species and production systems.

Research Areas

Evaluate the efficacy, welfare outcomes, operational feasibility and biosecurity implications of whole-house nitrogen foam and/or whole-house nitrogen gas depopulation systems under commercial poultry production conditions to support emergency depopulation and disease response implementation.

Research Questions

- How effective is whole-house nitrogen foam depopulation across different poultry species, ages, flock densities and housing systems? How effective is whole-house nitrogen gas depopulation across different poultry species, ages, flock densities and housing systems?
- What nitrogen concentration, foam expansion characteristics, application rate and exposure time consistently achieve rapid and humane depopulation? What additional parameters need to be considered for different flock ages, poultry species (layers, turkeys, broiler/breeders) and in various commercial poultry production systems?
- How do bird welfare indicators—including time to loss of posture (unconsciousness), time to death, behavioral responses and physiological stress measures—compare with currently approved depopulation methods? How can these welfare indicators be practically measured on-farm?
- What engineering modifications improve uniform foam/gas distribution throughout commercial poultry houses and maintenance of nitrogen concentration to achieve consistent and efficient depopulation outcomes?
- How do environmental conditions (house design, ventilation, external and barn temperature, humidity and litter conditions) affect system performance?

- What are the occupational safety risks associated with whole-house nitrogen application (foam or gas methods), and what engineering controls and personal protective equipment are needed to protect farm depopulation teams and emergency responders?
- Can whole-house nitrogen foam reduce virus aerosolization, environmental contamination, and pathogen spread compared with existing depopulation methods?
- What equipment configurations and deployment strategies minimize setup time while maximizing operational efficiency during emergency response?
- What are the labor requirements, equipment needs, costs, personnel and logistical considerations associated with implementing whole-house nitrogen depopulation methods (foam/gas) on a commercial scale?
- What protocols can be developed to standardize whole-house nitrogen depopulation procedures (foam/gas) for use during HPAI and other foreign animal disease outbreaks?

Proposal Submission

Researchers should submit only a maximum two-page pre-proposal summary that describes the parts of the objectives they wish to address and what they propose to do. A title, the researcher's name, affiliation and email address should be included in the pre-proposal. Details of procedures or specifics of the budget should not be included in the pre-proposal submission. Pre-proposals should be submitted electronically at: <https://www.uspoultry.org/programs/research/>.

DEADLINE FOR PRE-PROPOSAL SUBMISSION IS NOVEMBER 2, 2026.

The outcome of the pre-proposal review will be one of three responses from USPOULTRY:

- Send a full research proposal for consideration.
- Please make specific modifications to what you are proposing and send a full proposal.
- Do not send a full research proposal.

Full proposals will follow established USPOULTRY guidelines as seen at <http://www.uspoultry.org/>. Funds can be used for graduate students, technicians, research supplies and work and meeting travel. Funds cannot be used for professional (faculty or postdoc) salaries or equipment purchase. Up to 15% overhead is allowed. No budget, including overhead, may exceed \$125,000.