

Department of Animal Science

USDA-APHIS HPAI Response: Goals, Depopulation Policy, And Ventilation Shutdown Plus (+) Use

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Highly pathogenic avian influenza (HPAI) is a highly contagious respiratory disease among the poultry population with high avian mortality, creating significant economic losses and elevated costs for disease control and outbreak eradication. The first HPAI virus was identified in 1880 in Northern Italy in domestic birds (Swayne, 2008). In 1996, the H5N1 virus was identified in waterfowl in China (Centers for Disease Control (CDC), 2022). A new outbreak of a novel H5N1 subtype was reported in Asia, Africa, Europe and the Middle East by the end of 2021 and in Canada and the United States (U.S.) by early 2022 (CDC, 2022). At this writing, since the start of the outbreak on February 8, 2022, 208 million birds have been affected in the U.S. in all 50 states and one territory. Of those, 1,031 flocks have been commercial, and 1,210 flock have been backyard. The prevalence of animal health diseases can be addressed by implementing an increased level of biosecurity at the farm level. Biosecurity, surveillance and control strategies aim to reduce the introduction and the spread of HPAI, with emphasis on commercial producers (Thompson et al., 2025). However, measuring biosecurity adoption in commercial poultry operations is challenging due to producers' reluctance to publicly share their adoption, investment and ongoing efforts as well as a broader lack of standardized reporting across the industry (Thompson et al., 2025). The following HPAI response goals and depopulation policies were developed by USDA Animal and Plant Health Inspection Service (APHIS) and released on July 16, 2026 (USDA-APHIS, 2026a). These procedures may be revised as the situation develops or more information becomes available. The information is provided here in hopes that every poultry producer (backyard and commercial) will become familiar with the USDA's response goals and depopulation policies in event of HPAI striking your operation.

USDA HPAI Response Goals and Policy (Stamping Out)

The USDA-APHIS goals for HPAI response are to 1) detect, control and contain HPAI in poultry as quickly as possible; 2) eradicate HPAI virus using strategies to protect public health and the environment, and stabilize animal agriculture, the food supply and the economy; and 3) provide science- and risk-based approaches and systems to facilitate continuity of business for non-infected animals and non-contaminated animal products. In event of HPAI detections, achieving these three goals will allow individual poultry facilities, states, tribes, regions and industries to resume normal production as rapidly as possible. The objective is to allow the U.S. to regain disease-free status without the response effort causing more disruption and damage than the disease outbreak itself.

The primary control and eradication strategy for HPAI in domestic poultry in the U.S., as defined by international standards and the World Organisation for Animal Health (WOAH), is “stamping out.” “Stamping out” is defined in the WOAH Terrestrial Animal Health Code (2022) Chapter 4.19.6 as the “killing of all the animals infected or suspected of being infested, including those that have been directly or indirectly exposed to the casual pathogenic agent... The slaughter or killing of animals should be performed in accordance with Chapter 7.5 or Chapter 7.6, respectively.” The USDA will continue to evaluate, with states, producers and industry, the potential use of HPAI vaccine. However, stamping out of HPAI-infected poultry will always be part of any HPAI response policy, even if a protective vaccination strategy is implemented.

Rapid stamping out is necessary to prevent continued HPAI virus shedding and amplification. The amount of virus produced by infected birds is significant; the more virus that exists, the harder it is to control and contain an outbreak. In particular, environmental contamination becomes a significant challenge when depopulation is delayed and can result in further HPAI transmission. A depopulation delay creates a serious biosecurity challenge for responders, who must consider sick birds, their feces and everything in contact with those materials as infectious. Even with strict and well-enforced biosecurity measures, the raw amount of infectious material makes effective biosecurity during a response effort extremely challenging.

USDA-APHIS Epidemiological Principles of an HPAI Response

Three basic epidemiological principles form the foundation to control, contain, and eradicate HPAI in the U.S. poultry population:

1. *Prevent contact between the HPAI virus and susceptible poultry.*
 - a. This is accomplished through quarantine of infected poultry and movement controls in the Infected Zone(s) and Buffer Zone(s) (which comprise the Control Areas), along with biosecurity procedures to protect non-infected poultry.
 - b. Certain circumstances may warrant accelerating the depopulation or euthanasia of poultry at risk for exposure to HPAI to decrease the population density of susceptible poultry.
 - c. There is a serious transmission risk posed by people, material, conveyances and animals that may have been in contact with HPAI and serve as mechanical vectors. Contact between poultry and these items should be prevented, and transmission risk mitigated through stringent biosecurity and cleaning and disinfection measures.
2. *Stop the production of HPAI virus by infected or exposed animals.* This is accomplished by rapid mass depopulation (and disposal) of infected and potentially infected poultry.
3. *Increase the disease resistance of susceptible poultry to the HPAI virus or reduce the shedding of HPAI in infected or exposed poultry.* This may be accomplished by strategic emergency vaccination if a suitable vaccine is available and can be administered in a timely manner.

Mass Depopulation and Euthanasia as Defined by AVMA

Mass depopulation and euthanasia are not synonymous, and APHIS recognizes a clear distinction. Euthanasia involves the use of humane techniques to induce the most rapid and

painless and distress-free death possible (American Veterinary Medical Association (AVMA), 2020). Mass depopulation is a method by which large numbers of animals must be destroyed quickly and efficiently with as much consideration given to animal welfare as practicable, given extenuating circumstances. Mass depopulation is employed in an HPAI outbreak as a response measure to prevent or mitigate the spread of HPAI through the elimination of infected or potentially infected poultry. As stated by the AVMA (2026),

Depopulation refers to the rapid destruction of a population of animals in response to urgent circumstances with as much consideration given to the welfare of the animals as practicable. It may be required in response to natural or human-caused disasters, and it may be crucial to control disease spread or minimize public health and safety risks,,,, Animals designated for depopulation should be killed using methods that minimize pain and distress and result in rapid loss of consciousness and brain function. Methods must be effective and should consider impacts on animals, humans, and the environment.

In any event, euthanasia or mass depopulation should be provided to affected poultry as safely, quickly, efficiently and humanely as possible. In addition, the emotional and psychological impact on animal owners, caretakers, their families and other personnel should be minimized.

USDA-APHIS Stamping Out and Depopulation Policy

When criteria for a presumptive positive case have been met, the APHIS Administrator or Veterinary Services Deputy Administrator (Chief Veterinary Officer of the United States) or their designee will authorize APHIS personnel—in conjunction with state and tribal officials, and Incident Command personnel—to initiate depopulation on the Infected Premises.

Investigation of Contact Premises (any premises that house susceptible poultry that may have been exposed to HPAI) is also authorized at this time. Depopulation of poultry on contact premises, or poultry meeting the suspect case definition may also be authorized by APHIS officials—in coordination with state and tribal officials and Incident Command—depending on epidemiological information and outbreak characteristics. Preemptive depopulation of poultry on other premises in the Infected Zone (typically 3 kilometers around the index case, also known as the Infected Premises) may also be authorized.

Indemnity for depopulated poultry is authorized by APHIS as funds are available. The final determination to depopulate entire Infected Premises, specific houses/barns on Infected Premises, or depopulate Contact Premises, is made by state or tribal officials and APHIS. Best practices to contain and eradicate HPAI require rapid depopulation of infected poultry. Swift stamping out is required to prevent the amplification of HPAI virus and subsequent environmental contamination. In all cases, depopulation activities must incorporate effective biosecurity practices to control the HPAI virus and prevent further transmission.

Due to the risk of virus amplification in infected poultry, poultry that meet the HPAI presumptive positive case definition are depopulated as soon as possible, with the depopulation goal within 24 to 48 hours or less. Poultry on contact premises, or those meeting the suspect case definition, may also be depopulated as soon as possible, if such depopulation is determined necessary by state/tribal and APHIS officials. Again, the final determination to depopulate the entire infected premises, or specific houses on infected premises, or to depopulate contact premises will be made by state animal health officials, tribal officials, and APHIS.

AVMA Approved Depopulation Methods for Poultry

In 2026, the AVMA published an updated version of the AVMA Guidelines for the Depopulation of Animals. Table 1 provides a summary of AVMA approved depopulation methods with specific recommendations for methods preferred (Tier 1), methods permitted in constrained circumstances (Tier 2), and methods that are used as a last resort/extraordinary circumstances (Tier 3) situation. Section 6.4 of the AVMA guidelines describes the various tiers (AVMA, 2026). Different depopulation methods for poultry are described with consideration for the various farm type settings (e.g., floor reared, caged and aviary poultry housing systems, outdoor-access poultry, etc.) and poultry types (chicken, turkey, duck, farmed game, and ratites). In almost all cases, Tier 1 and Tier 2 depopulation methods will be used to rapidly “stamp out” the HPAI virus in poultry. However, to meet the goal of depopulation within 24 to 48 hours and halt virus production, other alternative methods may also be considered by state, tribal and APHIS officials. Each premises is evaluated individually, considering epidemiological information, housing and environmental conditions, currently available resources and personnel, and other relevant factors.

When no other preferred or alternative methods can be implemented to meet the 24-to48-hour depopulation goal, the AVMA Depopulation Guidelines permits ventilation shutdown (+) heat and humidity (VSD Plus (+)) as a Tier 2 depopulation method. The USDA-APHIS HPAI Response: Ventilation Shutdown Plus (+) Policy, further elaborates on use of this depopulation method (AVMA, 2026). The AVMA defines VSD Plus (+) as the addition of heat and/or humidity sources to accelerate or amplify the ambient building temperature to cause death by hyperthermia. Although VSD Plus (+) is permitted when there are constrained circumstances, its effectiveness can vary depending on the environment, temperature and humidity of where the outbreak takes place, and characteristics of the poultry barn including the ventilation system.

USDA Recommendations for VSD Plus (+) Under Constrained Circumstances for Poultry

The USDA notes the use of VSD Plus (+) provides additional health and safety considerations for responders performing field operations. In the event VSD Plus (+) is used, heat should be added to reach a temperature of 128 F within 15 minutes, for a minimum of three hours. Whenever VSD Plus (+) is used in constrained circumstances, the USDA also has the AVMA goal of achieving 100 percent mortality rate in as short of time as possible.

The USDA can grant the use of VSD Plus (+) in constrained circumstances; however, the following six requirements must be met:

1. Other methods are not available or will not be available in a timely manner.
2. The amplification of the virus on the premises poses a significant threat for further transmission and ongoing spread of HPAI.
3. The questions in the VSD Plus (+) policy document have been reviewed and discussed by APHIS officials, state or tribal officials, and the incident management team.
4. Incident management team approval.
5. State official’s approval.
6. National Incident Coordinator approval.

When these criteria are met, VSD Plus (+) may be implemented. Depending on the premises or state, written or electronic documentation of these criteria may be required.

Factors Considered to Implement Use of VSD Plus (+)

The need to implement alternative depopulation methods to meet the depopulation goal, and the use of VSD Plus (+), will be handled on a premises-by-premises basis, with close coordination and collaboration by state/tribal and APHIS officials. Three sets of issues will be considered: resources, epidemiology, and state/APHIS concurrence on the decision. In selecting the depopulation method, and considering VSD Plus (+), the following interrelated questions can help guide the decision (USDA-APHIS, 2026b):

- Which depopulation methods can be executed safely and effectively on the premises within 24 to 48 hours?
- What are the potential epidemiological consequences of virus amplification on the premises should the 24-to-48-hour goal not be met on the premises?
- Are there large densities of poultry in the surrounding area that would be at risk from virus amplification on the premises?
- Are there high-value or breeder flocks in the surrounding area that would be at risk from virus amplification on the premises?
- Could a depopulation time of greater than 24 to 48 hours be feasible if lateral spread can be mitigated through biosecurity measures, particularly in a facility without large densities of poultry or high value flocks in the surrounding area?
- Is there strong opposition from the state animal health official, or designee, on any given method given the answers to the previous questions?
- Is there strong opposition from the producer/owner on any given method, given the answers to the previous questions?
- What resources are required for AVMA Tier 1 or Tier 2 (besides VSD Plus (+)) depopulation methods?
- For AVMA Tier 1 or Tier 2 (besides VSD Plus (+)) depopulation methods, how quickly (in hours) can resources and personnel deploy and complete the depopulation safely and effectively?
- Are sufficient resources available to conduct AVMA Tier 1 or Tier 2 (besides VSD Plus (+)) depopulation methods within 24 to 48 hours?
- How many personnel are required for the completion of AVMA Tier 1 or Tier 2 (besides VSD Plus (+)) depopulation methods?
- Are sufficiently trained personnel available to conduct the preferred (Tier 1) depopulation method identified within 24 to 48 hours?
- Is VSD Plus (+) possible on the premises, given house construction and environmental factors?
- Is VSD Plus (+) the only option that will achieve rapid depopulation meeting the 24 to 48-hour goal, given personnel and resource constraints?
- What is the added risk of increased numbers of personnel on (and off) the premises from AVMA Tier 1 or Tier 2 (besides VSD Plus (+)) depopulation methods, such as CO₂ and water-based foam, in terms of biosecurity?

Summary

After only two reported cases of HPAI in the U.S. in July, four cases were reported between August 20 and 27 (one in Idaho and three in South Dakota) as fall waterfowl migration season begins to ramp up. The USDA-APHIS recently released updated response goals, depopulation and VSD Plus (+) policies to deal with the ongoing outbreak. Biosecurity continues to play a major role in protecting at-risk flocks. Integrators and producers should be familiar with current USDA-APHIS policies and guidelines related to HPAI in event of an outbreak as we enter the fall/winter waterfowl migration season. Continue to take the ongoing HPAI threat seriously as it appears to be making a resurgence as we head into fall. Maintain a strong biosecurity program as the first line of defense to protect your flock and your farm. Mass mortality, whether from HPAI or stamping out euthanasia, is a challenging situation to find yourself in, financially, physically, and emotionally. Take whatever steps are necessary to avoid such a situation.

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Table 1. AVMA depopulation methods in poultry¹.

Tier 1 (preferred)	Tier 2 (permitted in constrained circumstances)	Tier 3 (last resort/extraordinary circumstances)
Commercial or private humane slaughter processing	Containerized gassing	Potassium chloride and magnesium salts
Whole house gassing (CO ₂ or N ₂)	Whole-house gassing with gas mixtures	Oral anesthetics
Low-atmospheric-pressure stunning	Manual blunt force trauma	Exsanguination
Barbiturate/barbituric acid derivatives	Medium/low density foams (water-based)	Compressed air foams
Nonpenetrating captive bolt	Ventilation shutdown plus heat and humidity (VSD+)	VSD alone
Cervical dislocation		
Electricity		
Gunshot		
Captive needle		
High-expansion N ₂ -filled foam		

¹Adapted from USDA-APHIS, 2026.



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