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Recommendations for the Depopulation of Poultry Flocks

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 is required when urgent circumstances threaten animal populations, human beings, and/or the environment. Depopulation is not to be deployed under ordinary circumstances and should only be used during times of emergency.

This guidance has been created for veterinarians, poultry companies and producers/farmers to increase awareness about available emergency poultry depopulation methods, the limitations of each method and how they can be applied under various circumstances within the setting where poultry species are commonly raised, and additional considerations for depopulation during emergency situations.

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Depopulation defined

The American Veterinary Medical Association (AVMA) has defined depopulation as the rapid and efficient destruction of a complete population of animals in response to urgent circumstances with as much consideration given to the welfare of the animals as practicable. (*Reference: 2019 AVMA Guidelines for the Depopulation of Animals* <https://www.avma.org/sites/default/files/resources/AVMA-Guidelines-for-the-Depopulation-of-Animals.pdf>)

Ethical decisions during an emergency

Depopulation involves making ethical decisions within the context of an emergency situation. Depopulation, as a method of containment for effective emergency or disaster management and response, should account for human well-being, animals and their welfare. The hard decisions that need to be made during the extraordinary situation should be based on sound ethical grounding and standards. Ethical reasoning cannot be suspended or ignored. When unforeseen circumstances result in disruptions that do not result in increased risk for animal suffering and/or human health, the AVMA Guidelines for the Euthanasia of Animals should be used. (*Reference: 2020 AVMA Guidelines for the Euthanasia of Animals* <https://www.avma.org/sites/default/files/2020-01/2020-Euthanasia-Final-1-17-20.pdf>)

Emergency conditions that may necessitate depopulation of poultry flocks

Emergency events that may necessitate the consideration of depopulation of animals may include the widespread loss of essential survival resources during natural disasters (ex: tornados, earthquakes or floods); non-natural disasters (ex: incidents involving terrorism, bioterrorism, conventional or nuclear attack, or accidents that result in the loss of structural integrity to the poultry housing); toxic chemical spills or contamination of food and water supplies; zoonotic or pandemic disease that threatens public health and the food supply; reportable or highly infectious poultry disease in a geographic region or species; and severe market disruption.

Urgent circumstances that may require the rapid and efficient destruction of a population of poultry include, but are not limited to:

- **Natural disasters:** Depopulation may be required when poultry cannot be removed from harm's way to prevent or relieve animal suffering. Following a natural disaster, farms and/or poultry housing may be damaged to an extent that is hazardous for personnel to safely enter buildings. Additionally, if farms remain intact but basic services, including animal care and feeding, are unable to be restored in time to prevent animal suffering, depopulation may be required to prevent or relieve animal suffering.
- **Non-natural disasters:** Depopulation may be required during non-natural disasters, such as an incident of terrorism, bioterrorism, nuclear power plant incident, accident, loss of structural integrity to the poultry housing, etc. to prevent or relieve animal suffering and to protect worker and public health.
- **Intoxications or contamination of food/water supplies:** Depopulation of poultry exposed to toxic substances, to contaminants of food and water supplies or to other adulterants or intoxicants may require depopulation to prevent real or perceived threats to food safety or immediate or impending danger to poultry welfare from the toxicant exposure.
- **Zoonotic or pandemic diseases:** Depopulation may be required because of real or perceived public health threats, such that poultry can no longer be moved or marketed. Zoonotic or pandemic diseases may complicate or increase the burden of accomplishing depopulation owing to the level of personal protection required to prevent human exposure.
- **Reportable diseases:** Depopulation may be used by state and federal animal health officials as the first line of defense to quickly control and eradicate a reportable poultry disease by preventing further disease replication in infected, exposed, or at-risk flocks. Stop movements may be implemented in disease control areas and result in the need for depopulation of poultry on non-infected farms.
- **Highly infectious avian diseases:** Within a geographic area, depopulation of infected and susceptible poultry flocks may be required to prevent the rapid spread and further pathogen replication for a highly infectious disease so that additional flock infections and further losses are mitigated.
- **Severe market disruption:** Depopulation may be required for any eventuality that reduces or eliminates the marketability of poultry. However, depopulation for severe market disruption should only be considered when the disruption has created extraordinary circumstances where animals may need to be euthanized or depopulated as a final option when no other solutions exist. This circumstance should be considered to prevent animal suffering and negative poultry welfare outcomes.

Choosing a Depopulation Method

The challenge facing veterinarians and others tasked with depopulation is to balance aggressive management of and rapid response to an emergency situation with animal welfare concerns surrounding humane destruction. Veterinarians are positioned to offer sound professional judgment as the value of animals' lives and their welfare is weighed against immediate risk to human beings, other populations of animals, or the environment.

Although practical limitations may include availability of equipment and skilled expertise, biosecurity, finances or cost, and time, the method of depopulation must balance ethical responsibilities to animal welfare and the well-being of veterinarians and other responders, all while maintaining public trust and confidence. Therefore, the choice of terminal method, the handling of animals, and the disposal of animal carcasses should adhere to strong ethical standards and procedures and to state and federal laws.

Depopulation Methods

The decisions surrounding depopulation should be made with consideration of professional, ethical, and technical aspects as well as the availability of infrastructure, equipment, and trained personnel; human and animal welfare; and disposal and environmental outcomes. The methods involved in depopulation will also reflect the severity of the emergency in question, and responsible decisions with regards to depopulation will also include trade-offs.

Depopulation methods may not be congruent with euthanasia methods since they involve the mass termination of large populations of animals. The AVMA Guidelines for the Depopulation of Animals defines the methods as follows:

Preferred methods are given the highest priority and should be used preferentially when circumstances allow reasonable implementation during emergencies.

Permitted in constrained circumstances methods are permitted only when the circumstances of the emergency are deemed to constrain the ability to reasonably implement a preferred method. Potential constraints include, but are not limited to, constraints on zoonotic disease response time, human safety, depopulation efficiency, deployable resources, equipment, animal access, disruption of infrastructure, and disease transmission risk.

Not recommended methods should be considered only when the circumstances preclude the reasonable implementation of any of the preferred or permitted in constrained circumstances methods and when the risk of doing nothing is deemed likely to have a reasonable chance of resulting in significantly more animal suffering than that associated with the proposed depopulation technique. Examples include, but are not limited to, structural collapse or compromise of buildings housing animals, large-scale radiologic events, complete inability to safely access animals for a prolonged period of time, or any circumstance that poses a severe threat to human life.

Depopulation Methods for Poultry

	Preferred Methods	Permitted in constrained circumstances	Not recommended
Floor-reared / confined poultry:	<ul style="list-style-type: none"> • water-based foam generators, water-based foam nozzles • whole-house gassing, partial-house gassing, containerized gassing • cervical dislocation, mechanically assisted cervical dislocation, and captive bolt gun 	<ul style="list-style-type: none"> • gunshot • VSD plus • controlled demolition • exsanguination, decapitation 	<ul style="list-style-type: none"> • VSD alone
Cage-housed poultry	<ul style="list-style-type: none"> • whole-house gassing, partial-house gassing and containerized gassing 	<ul style="list-style-type: none"> • compressed air foam • cervical dislocation, mechanically assisted cervical dislocation, captive bolt gun, and decapitation • VSD plus 	<ul style="list-style-type: none"> • water-based foam generators, water-based foam nozzles • gunshot, • VSD alone
Outdoor-access poultry	<ul style="list-style-type: none"> • containerized gassing • captive bolt gun, cervical dislocation, mechanically assisted cervical dislocation 	<ul style="list-style-type: none"> • water-based foam generators, water-based foam nozzles, • partial-house gassing • gunshot via firearm or pellet gun, exsanguination, decapitation, cervical dislocation • controlled demolition 	<ul style="list-style-type: none"> • whole-house gassing • VSD alone

Note: Ventilation shutdown (VSD) plus (ex: VSD plus heat, VSD plus CO2, and VSD plus heat and CO2) applied in a manner that will produce a 100% mortality rate meets the classification category permitted in constrained circumstances. Ventilation shutdown (VSD) alone is categorized as not recommended.

The methods listed above have been shown to be appropriate for poultry depopulation based on the available scientific literature and experience. However, this list may not be all-inclusive. The appropriateness of alternative options should be assessed using the following criteria:

- Ability to induce loss of consciousness followed by death in a timely manner with a minimum of pain or distress.
- Reliability and irreversibility of the method to result in death of the animal.
- Compatibility with the safety of humans, other animals, and the environment.
- Potential psychological or emotional impacts on personnel and sensitivity to public sentiment regarding the destruction of large numbers of animals.
- Availability of agents and carcass-processing and disposal venues to handle the volume.
- Ability to maintain equipment needed for depopulation in proper working order.
- Compliance with legal requirements.

Additional Depopulation Considerations

Every situation where depopulation is considered will be unique due to the limitations and constraints imposed by the type of the poultry, the emergency situation, resource availability, geography, site variation, local regulations, etc. When choosing a depopulation method, the factors highlighted here must be considered. Producers should work with their poultry and/or state veterinarian to discuss these factors of the situation and justification for choosing the depopulation method used.

Legal requirements

Become familiar with state laws that may influence the depopulation process. This includes laws related to animal abuse and neglect, firearm usage, mortality management, or restrictions on access to needed resources.

Poultry disease characteristics

The scope of the outbreak will impact the number of poultry to be depopulated and resource availability.

- Understand how the epidemiology, transmission route, and pathogenesis of the disease-causing agent will impact the timeline for depopulation, labor needs and worker safety precautions, the physical condition of poultry, scope of depopulation, carcass disposal method, and cleaning and disinfection.
- Evaluate the current and ongoing disease status (ex: infected, contact, or clean) of the site which will help define the timeline and scope of depopulation.

Time constraints

Select a method with the ability to achieve the necessary throughput to accomplish depopulation within the established time constraint.

- State or federal regulatory authorities will establish the timeline for depopulation during a notifiable disease outbreak.

Ownership and indemnity

Depopulation planning and coordination is essential when the owner of the poultry differs from the owner of the farm.

- Approval before depopulation occurs must be factored into any plan where there is an appraisal and indemnity process to offset the financial losses to owners. For example, insurance company or government authority approval may be required.

Personnel availability

Determine the number of personnel needed and the training required to perform the depopulation method.

- Consider the amount of downtime required if personnel are moving between sites to perform depopulation.
- Create work/shift schedules that allow for some downtime to protect human well-being and safety.

Worker health and safety

The cause for depopulation will pose varying risks for worker health and safety, which should be a primary consideration when choosing a depopulation method. Responders will need to wear appropriate personal protective equipment (PPE).

- The type and/or availability of PPE required may impact which method can be utilized and/or how the chosen depopulation method is performed.
- Designate an individual to address and ensure worker health and safety during all phases of the depopulation process.

Operator and observer impact

Consider the aesthetics of the chosen depopulation method and the impact the depopulation process will have on observers, operators, and producers. Make appropriate social services and mental health support resources available to all participants in the depopulation process, regardless of method used.

Public perception

The scope of depopulation and the chosen depopulation method should be proportional to the scope and urgency of the situation. Consider how and where the method can be performed to limit the number of observers and to protect public health and safety. When appropriate, especially for large-scale depopulation events, the use of law enforcement to protect boundaries and maintain public safety is advisable.