



SWINE DEPOPULATION

Modified from the AVMA Guidelines for the Depopulation of Animals: 2019 Edition

IMPLEMENTATION WITH PRIORITIZATION

Methods for depopulation are used when the rapid destruction of a population of pigs must occur in response to urgent circumstances. Various physical, chemical, and inhalant methods may be used for depopulation provided the method can be applied by competent personnel in the time frame allotted. Not all methods will induce death in a manner that is consistent with euthanasia. The welfare of swine must be considered when methods are selected, such that the most humane method of depopulation is used whenever possible.

PREFERRED METHODS

Physical Methods: All physical methods considered acceptable or acceptable with conditions outlined in the AVMA Guidelines for the Euthanasia of Animals (gunshot, PCB, and nonpenetrating captive bolt) or techniques covered by the AVMA Guidelines for the Humane Slaughter of Animals are considered preferred methods with appropriate consideration for the size and age of the animal.

In addition, the following physical methods not outlined in the euthanasia guidelines are considered preferred.

- **Gunshot:** For nursery, growing, finishing, and mature pigs, a gunshot to the head can be used for depopulation if done correctly. Gunshot is not appropriate for depopulation of suckling pigs. The practicality of using gunshot decreases as the number of swine to be depopulated increases. Ideally, the pig should be outdoors and on soil to reduce the chance of ricochet. Gunshot should not be used for depopulation if human safety cannot be assured, the size of the gun and ammunition cannot ensure the effectiveness of the technique, or users are not trained in firearm safety.
- **Nonpenetrating Captive Bolt:** For suckling and nursery pigs, a nonpenetrating captive bolt can be used for depopulation. A nonpenetrating captive bolt is not appropriate for grower, finisher, or mature pigs. The practicality of using a captive bolt decreases when time is a factor and the number of swine to be depopulated increases. A nonpenetrating captive bolt should not be used if the force achieved is not effective for the weight of the pig being depopulated. Captive bolts should not be considered for depopulation if the pigs cannot be properly restrained and the captive bolt cannot be properly applied or human safety cannot be assured.
- **Penetrating Captive Bolt (PCB):** For nursery, growing, and mature pigs, a PCB can be used for depopulation. The practicality of using a captive bolt decreases when time is a factor and as the number of swine to be depopulated increases. Captive bolts should not be used for depopulation if the bolt length and cartridge combinations are not appropriate to the size and age of the pig being depopulated. Captive bolts should not be considered for depopulation if the pigs cannot be properly restrained and the captive bolt cannot be properly applied or human safety cannot be assured.

- **Electrocution:** Electrocution can be used for depopulation for pigs over 10 lb (4.5 kg). If head-only electrocution is selected for depopulation, a secondary method is needed such as head-to-heart electrocution, across-the-chest electrocution, or exsanguination. Electrocution should not be used for depopulation if human safety cannot be ensured and if adequate amperage and voltage cannot be achieved for the age of the pig to render the brain insensible and initiate cardiac fibrillation and death. Head-only electrocution should not be used if a secondary method cannot be applied within 15 seconds of initial stunning of the pig.
- **Manual Blunt Force Trauma:** Blunt force trauma is effective only for suckling and young pigs where the frontal bones are not fully developed, leaving the brain susceptible to blunt, and high-velocity impact. This method may not be practical for the depopulation of large numbers of swine.
- **Movement to Slaughter:** Transport to processing plants with routine use of stunning and kill methods should be used for grower or adult pig depopulation, whenever possible. Processing plants are purpose built to handle humane killing of large numbers of pigs on a daily basis. This method may be recommended provided that certain circumstances are met, including the following:
 - A competent authority grants permission to transport pigs to a processing plant.
 - The processor is willing to conduct emergency slaughter.
 - The pigs being killed do not pose a public safety risk.
 - The pigs are mobile with minimal outward signs of disease.
 - Animal movement during transit poses minimal risk to other animals.
 - Swine pass pre- and postmortem inspection at the plant.

Inhaled Methods:

- **Carbon Dioxide:** Carbon dioxide is a practical means for depopulation provided certain criteria are met to address the numbers and size of pigs. Carbon dioxide can be used for suckling or nursery pigs (up to 70 lb [154 kg]). In properly constructed chambers, a CO₂ displacement rate of 20% of the container volume/min for 5 minutes will result in unconsciousness within 2 minutes and death within 10 minutes. Methods described would also be expected to reduce physical demands on animal workers and veterinarians engaged in depopulation. Inadequate flow rates can result in lack of death or can result in the pig's suffocating before it becomes anesthetized or loses sensibility.

Noninhaled Methods:

- **Anesthetic Overdose:** Anesthetic overdose can be used for depopulation but is not practical for the depopulation of large numbers of swine. Overdose should not be used for depopulation if IV administration cannot be achieved or carcasses cannot be disposed of appropriately.

PERMITTED IN CONSTRAINED CIRCUMSTANCES

- **Compounded or Non-Pharmaceutical Grade Injectable Anesthetics and Euthanasia Agents:** Use of compounded or non-pharmaceutical-grade injectable anesthetics and euthanasia agents is justified for depopulation. The veterinarian may make a professional judgment about the use of agents that have exceeded their product expiration date.
- **Ventilation Shut Down (VSD):** Ventilation shutdown involves closing up the barn, shutting inlets, and turning off fans. Body heat from the herd raises the temperature until animals die from hyperthermia. Numerous variables may make the time to death of 100% of animals in the barn subject to a range of times. The Panel on Depopulation (POD) recommends that VSD only be used in facilities with the capability to adequately increase air temperature to a level that causes the

generation of latent heat that results in a > 95% death rate in < 1 hour. The goal of any depopulation is 100% mortality, and this remains true for VSD. To achieve this goal, additional heat sources or the addition of CO2 may be needed.

- **Sodium Nitrite:** High doses of sodium nitrite have been used in various bait forms for the control of feral swine through the induction of methemoglobinemia when an adequate amount of bait is ingested. Sodium nitrite baits have been tested in domestic and feral swine and are efficacious provided pigs consume a toxic dose in a short period of time. Sodium nitrite could be used for depopulation provided there is an adequate supply of sodium nitrite available in a form that ensures ingestion at a level that results in a toxic dose and death within an acceptable time frame.

CONFIRMING INSENSIBILITY AND DEATH

Regardless of the depopulation method used, it is important that every effort be taken to confirm insensibility and death provided it does not cause a risk to human health or safety.



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