


## Euthanasia and Mass Depopulation During Animal Health Emergencies

*Overview and Considerations*



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## Definitions

- Euthanasia
  - “Good death”
  - As painless and stress free as possible
- Mass depopulation
  - Large numbers of animals
  - Safely, quickly and efficiently destroyed
- Moral obligation to ensure welfare

Euthanasia and Mass Depopulation

## Goals of Euthanasia

- Humane treatment at all times
- Acceptable method
  - Quick, efficient and humane
- Minimize negative psychological impact
  - Animal owners and caretakers, responders, public
- Prevent disease spread
- Prevent adulterated animal products from entering food chain

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## CONSIDERATIONS

- Guidelines
- Method Selection
- Procedure
- Personnel
- Animal Welfare
- Public Perception


## Euthanasia Guidelines

- American Veterinary Medical Association
  - Guidelines on Euthanasia (2013)
- FAD PReP/NAHEMS Guidelines:
  - Mass Depopulation and Euthanasia
- World Organization for Animal Health (OIE)
  - Terrestrial Animal Health Code (Ch. 7.6)
    - Killing Animals for Disease Control Purposes

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## Method Selection


- Species
- Number of animals
- Handling and restraint
- Technical skill
- Cost
- Residues
- Personnel safety
- Regulations



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### Procedure Considerations

- Humane treatment
  - Quickly rendered unconscious
  - Minimize pain and stress
- Skilled personnel
- Confirmation of death
  - Back-up method
- Site selection



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### Animal Welfare

- Calm, gentle handling
- Non-slip surfaces
- Indoors – consider access for removal and disposal
- Non-ambulatory animals euthanized where they are
- JIT Guidelines for handling/restraint
  - <http://www.cfsph.iastate.edu/Emergency-Response/just-in-time-training.php>

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### Public Perception

- Conduct indoors or away from public view
- Treat animals humanely at all times
- Media may help convey information
  - Necessity of depopulation
  - Updates
- Public Information Officer (PIO) should coordinate to treat the situation proactively

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### EUTHANASIA METHODS

- Physical
- Chemical

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### Physical Euthanasia Methods


- Captive bolt
- Gunshot
- Special circumstance
  - Electrocutation (swine)
  - Cervical dislocation, decapitation (poultry)
- Adjunct physical methods
  - Exsanguination and pithing



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### Chemical Euthanasia Methods

- Injectable drugs
  - Barbiturates/ barbituric acid derivatives
  - Documentation of controlled substances
- Gas
  - Anesthetic gases
  - Carbon monoxide
  - Carbon dioxide
- Adjunct injectable chemical methods



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### Methods of Euthanasia

- Physical methods
  - Quick, painless, humane, practical
  - Require technical skill, highly trained personnel
- Chemical methods
  - Pet livestock, companion animals
  - Impractical for mass depopulation of livestock
    - Chemical residues
    - Large volume of drugs required
    - Increased handling to inject drugs
    - Cost of chemicals

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### Unacceptable Methods of Euthanasia

- Manually applied blunt trauma
- Injection of any chemical not labeled for use as a euthanasia agent
- Injection of air into blood vessel
- Electrocution with a 120 or 220 volt electrical cord

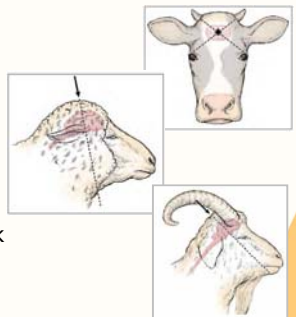
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## EUTHANASIA METHODS BY SPECIES

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### Bovine, Sheep, Goat Euthanasia

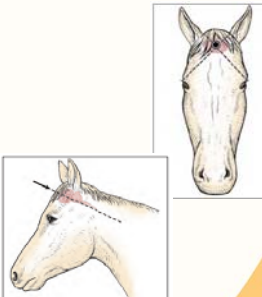
- Primary methods
  - Captive bolt
  - Gun shot
- Adjunct methods
  - KCL, Magnesium salts
  - Exsanguination, pithing
- Companion livestock
  - Injectable drugs
    - Barbiturates



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### Equine Euthanasia

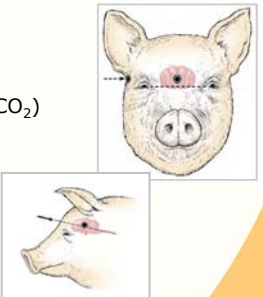
- Primary methods
  - Sedation then barbiturate
  - Captive bolt
  - Gunshot
- Adjunct method
- Safety issues



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### Swine Euthanasia


- Primary methods
  - Captive bolt
  - Gunshot
  - Gas: Carbon dioxide (CO<sub>2</sub>)
    - Only for smaller swine
- Adjunct methods
- Companion livestock
  - Injectable drugs



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### Poultry Euthanasia

- **Methods**
  - Inhaled anesthetics
    - Carbon dioxide (CO<sub>2</sub>)
    - Water-based foam
  - Injectable anesthetics
  - Cervical dislocation for smaller birds
  - Decapitation NOT recommended if other means available



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### Confirmation of Death

- Death must be confirmed on each individual animal
- **Parameters**
  - Lack of heartbeat
  - Lack of respiration
  - Lack of corneal reflex
    - The eyelid is not closed when the cornea/eyeball surface is touched
  - Presence of rigor mortis

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### PERSONNEL

- Training
- Safety
- Psychological Impact

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### Personnel Training


- Animal handling
- Approved euthanasia method to be used
- Safety issues
- PPE
- Biosecurity
- Cleaning and disinfection procedures



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### Safety


- **Specific considerations**
  - Size, weight,
  - Temperament
    - Dangerous animals
    - Animal familiarity humans
  - Restraint methods available
  - Euthanasia method and/or equipment available



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### Psychological Impact: Responders


- Compassion fatigue
- Post-traumatic stress disorder (PTSD)
- Recognition in self and others
- Psychological first aid
- Counselors and mental health experts should be available



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### Psychological Considerations: Owners and Stakeholders

- Owners should not be present
- If present, brief owners on
  - Chosen euthanasia method
  - Safety
  - Counseling services
- Public Information Office in charge of communications



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### References and Resources

- AVMA Guidelines for the Euthanasia of Animals
  - <https://www.avma.org/KB/Policies/Documents/euthanasia.pdf>
- FAD Prep/NAHEMS Guidelines Mass Depopulation and Euthanasia
  - <http://www.cfsph.iastate.edu/pdf/fad-prep-nahems-guidelines-mass-depopulation-and-euthanasia>
- Procedures for Humane Euthanasia. Iowa State University College of Veterinary Medicine
  - [http://vetmed.iastate.edu/humane\\_euthanasia/en/euthanasia-downloads#Index](http://vetmed.iastate.edu/humane_euthanasia/en/euthanasia-downloads#Index)
- World Organization for Animal Health (OIE) Terrestrial Animal Health Code
  - Killing of Animals for Disease Control Purposes
  - [http://www.oie.int/fileadmin/Home/eng/Health\\_standards/tahc/2010/en\\_chapitre\\_1.7.6.htm](http://www.oie.int/fileadmin/Home/eng/Health_standards/tahc/2010/en_chapitre_1.7.6.htm)

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### Acknowledgments

Development of this presentation was by the Center for Food Security and Public Health at Iowa State University through funding from the Multi-State Partnership for Security in Agriculture

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