



# **AVMA Guidelines on Euthanasia 2011/2012 Edition**

Gail C. Golab, PhD, DVM, MANZCVS  
Director, Animal Welfare Division



# POE Definitions and Approach

- **Euthanasia** = “good death”; kill in a way that minimizes or eliminates pain and distress
- **Unconsciousness** = loss of individual awareness; in animals, loss of the righting reflex (assumes absence of other drugs/injury inducing paralysis)
- Organize as a process → minimize pain and distress
  - Pre-euthanasia assessment
  - Methods and agents
  - Animal handling
  - Post-euthanasia assessment
  - Disposal of remains
- Depopulation and slaughter to be handled in separate AVMA Guidelines (estimate 2013)



# Criteria Evaluated



- Induce loss of consciousness and death with **minimal pain and distress**
- Time to induce loss of consciousness
- Reliability
- Safety of personnel
- Irreversibility
- Compatibility with intended animal use and purpose
- Documented performance and emotional effects on operators and observers
- Compatibility with evaluation, examination, use of tissue
- Drug availability and human abuse potential
- Compatibility with species, age and health status
- Ability to maintain equipment in proper working order
- Legal requirements
- Environmental/safety impacts of the method or remains



# Classifying Methods

- **Acceptable**—Consistently produces a humane death when used as the sole means of euthanasia
- **Acceptable with Conditions**
  - Specific conditions required to consistently produce a humane death
  - Greater potential for human error or safety hazard
  - Not well documented in the literature
  - May require a secondary step to ensure death
- **Adjunctive**—Should not be used as sole method, but may be used with others to bring about euthanasia
- **Unacceptable**
  - Methods found to be inhumane under any conditions
  - Methods found to pose substantial risk to humans applying technique



# Equivalence Statement

***“Acceptable with Conditions” is equivalent to “Acceptable” when criteria for application are met.***

# Who Made These Recommendations?

## Our Experts



Dr. Steven Leary, **Panel Chair**

Dr. Wendy Underwood, **Panel Vice Chair**

Dr. Raymond Anthony, Ethicist

### **Method Working Group Chairs**

Dr. Temple Grandin, Physical Methods

Dr. Sharon Gwaltney-Brandt, Non-Inhalants

Dr. Robert Meyer, Inhalants

### **Species/Use Working Group Chairs**

Dr. Samuel Cartner, Laboratory Animals

Dr. Douglas Corey, Equids

Dr. Cheryl Greenacre, Birds

Dr. MaryAnn McCrackin, Companion Animals

Dr. David Miller, Reptiles, Zoo and Wild Animals

Dr. Jan K. Shearer, Farmed Animals

Dr. Roy Yanong, Aquatic Animals

### **Supported by staff**

Dr. Gail Golab, Director, Animal Welfare

Dr. Emily Patterson-Kane, Animal Welfare Scientist

Kathy Sikora, Administrative Assistant

# Farmed Animal Working Group



<b>Poultry</b>	<b>Swine</b>	<b>Bovine/Small Ruminants</b>
<b>Dr. Eric Benson</b> University of Delaware	<b>Dr. Scanlon Daniels</b> Circle H , LLC	<b>Dr. Dee Griffin</b> University of Nebraska
<b>Dr. Robert Evans</b> Cargill Turkey Prod., LLC	<b>Dr. John Deen</b> University of Minnesota	<b>Dr. Glen Johnson</b> Reedsburg, Wisconsin
<b>Dr. Richard Reynnells</b> USDA /NIFA/IFPS/AS	<b>Dr. Jerome Geiger</b> Pig Improvement Co.	<b>Dr. Jim Reynolds</b> Western University CVM
<b>Dr. Bruce Webster</b> University of Georgia	<b>Dr. Christa Irwin</b> Iowa State University	<b>Dr. Jan Shearer, Chair</b> Iowa State University



# Covered Species and When

- Includes poultry, ratites and other domesticated birds used for egg, meat or feather production
- Choose euthanasia
  - Birds unable to access nutrition (food/water) = blindness, weakness
  - Trauma = birds with serious injury
  - Cull = birds unlikely to survive
  - Should not be delayed in any situation where birds may suffer







# Poultry—Acceptable



- ***Barbiturates, barbituric acid derivatives; injectable anesthetics***

- Appropriate for small numbers of birds
- Requires restraint
- Involves controlled substances and requires veterinarian
- Tissue residues limit carcass disposal options



# Poultry—Acceptable With Conditions



- ***Carbon dioxide (CO<sub>2</sub>)***

- Mechanism of action = hypoxia
- Most common gas used for euthanasia of poultry
- Extensively studied in chickens, turkeys and ducks
- Adult birds, newly hatched poultry, non-hatched eggs (pips)
- Conditions
  - Must be in purified form without contaminants
  - Pressure-reducing regulator and flow meter or equivalent to ensure appropriate delivery/concentration
  - Gradual displacement preferred; birds must be rendered unconscious prior to exposure to 100% CO<sub>2</sub>
  - Newly hatched birds and pips more resistant to CO<sub>2</sub> and often require higher concentrations (80-90%) for euthanasia compared with adult birds
- Often invokes unconscious motor activity (wing flapping); can damage tissue and be unsettling to observers
- Narcosis is a human safety risk





# Poultry—Acceptable With Conditions

- ***Carbon monoxide (CO)***
  - Must achieve and maintain a concentration of 6%
  - Convulsions are more common
  - Human exposure risk is significant
- ***Nitrogen or argon***
  - Used alone or mixed with 30% CO<sub>2</sub>
  - Residual atmospheric O<sub>2</sub> must be brought to and held at ≤ 2%
  - Convulsions frequently occur
- ***For all gases...confirmation of death is critical***



# Poultry—Acceptable With Conditions



- ***Cervical dislocation*** (CD, performance standards)
  - Grasp legs (or wings at base) and pull head while applying ventrodorsal rotational force to the skull
  - Must result in luxation of cervical vertebrae without primary crushing of the vertebrae and spinal cord.
  - For some classes of poultry (esp large birds) there is some evidence that CD may not cause immediate unconsciousness
- ***Manually applied blunt force trauma***
  - For birds too large for CD
  - Fatigue can make application to large numbers of birds difficult



# Poultry—Acceptable With Conditions



- ***Decapitation***
  - Use sharp instrument to accomplish rapid and unobstructed severing of head from neck
  - Bleeding cone may facilitate restraint
  - After CD or manually applied blunt force trauma to ensure death
- ***Electrocution***
  - Individual birds
  - Some birds may not develop ventricular fibrillation even at high amp
  - Observe to confirm death; use adjunctive method as necessary
  - Human safety a concern
- ***Gunshot***
  - Free-ranging poultry and ratites when restraint not feasible/desirable
  - Not recommended for captive poultry; human safety a concern



# Poultry—Acceptable With Conditions

- ***Penetrating and non-penetrating captive bolt***
  - Large poultry (e.g., turkeys, broiler breeders, ratites, waterfowl)
  - Powered by cartridges, compressed air or spring
  - Optimal position at right angles to the frontal surface
  - Should lead to immediate destruction of skull and brain and, hence, immediate death
  - Confirm death; if not, second shot or other means acceptable for conscious bird
  - Essentially blunt force trauma, but more aesthetic; greater acceptance in multiple species (e.g., rabbits, pigs, sheep)
  - Concerns about cost





# Poultry—Adjunctive

- ***Potassium chloride or magnesium sulfate***
  - Must be anesthetized or stunned
  - Unacceptable in conscious bird
- ***Exsanguination***
  - Must be anesthetized or stunned
  - Unacceptable in conscious bird
  - Biosecurity precautions



# Poultry—Embryos and Neonates

- ***Embryonated eggs***
  - Prolonged exposure to CO<sub>2</sub>
  - Cooling (4 hr at 40F) or freezing
  - Anesthetics in air cell
  - Addling
- ***Maceration***
  - Embryonated eggs, pips, newly hatched up to 72 hours old
  - Specialized equipment kept in excellent working order
  - Poultry must be delivered to the macerator in a way that prevents backlog, and without causing injury, suffocation or avoidable distress





# Always



- Appropriate and well-maintained equipment, training and monitoring for competency applies across all methods
- Aesthetics becoming increasingly important—perception is reality
- *Guidelines* evolve, based on current science and practicalities of implementation; goal of continued improvement
- Where is 2011-2012 edition?...in final editorial stages

# Thank You For Your Time and Attention



Questions?

[ggolab@avma.org](mailto:ggolab@avma.org)  
[ekane@avma.org](mailto:ekane@avma.org)