

POULTRY EUTHANASIA**1. PURPOSE**

To describe the decision-making process and methods to euthanize small and large populations of hatched poultry.

2. RESPONSIBILITY

- 2.1 Poultry Unit Technician
- 2.2 Farm manager
- 2.3 Veterinarian
- 2.4 Trained research personnel

3. SPECIAL CONSIDERATIONS

- 3.1 All personnel responsible for euthanizing birds must be trained and have the required competency for appropriate handling, euthanasia techniques, assessing insensibility and death, use and maintenance of equipment, and disposal of carcasses. Document all training.
- 3.2 Anesthesia or sedation is necessary prior to physical methods of euthanasia unless described in the Animal Use Protocol (AUP) and approved by the Facility Animal Care Committee (FACC).
- 3.3 Whenever possible, animals should not be present during the euthanasia of others, especially of their own species. This is particularly important when vocalization or release of pheromones may occur during the induction of unconsciousness.
- 3.4 All euthanasia procedures must be continuously monitored by the person(s) performing the procedure until confirmation of euthanasia is complete. Animals must not be left unattended until the procedure is complete.
- 3.5 It is important to euthanize without delay birds that:
 - are unlikely to recover
 - fail to respond to treatment and recovery protocols
 - have signs of chronic, severe, or debilitating pain and distress
 - are unable to access feed and water
 - are unable to stand or walk
 - show marked weight loss/loss of body condition.
- 3.6 It is important that everyone who works with birds is trained to recognize normal behavior as well as signs of pain, injury, illness, and distress that indicate that euthanasia may be necessary.
Examples of distress requiring euthanasia include:
 - Automutilation
 - Respiratory distress (ex. open mouth breathing)
 - Emaciated
 - Moribund
 - Excessive feather plucking
 - Multiple/severe fighting wounds and trauma
 - Fracture
 - Cloacal prolapse
- 3.7 For a technique to be considered acceptable as a method of euthanasia, it must;
 - 3.7.1 Render the bird unconscious quickly

- 3.7.2 Be able to be administered in a reliable (repeatable) manner
- 3.7.3 Must result in an irreversible loss of consciousness followed by cardiac or respiratory arrest and, ultimately, a loss of brain function.
- 3.8 Consideration for selecting a euthanasia method:
 - 3.8.1 The amount of pain and distress induced by the euthanasia method.
 - 3.8.2 Size and weight of the bird
 - 3.8.3 Number of birds
 - 3.8.4 Amount of restraint required
 - 3.8.5 Skill and comfort level of the operator
 - 3.8.6 Ready access to the necessary equipment.
 - 3.8.7 Human safety
 - 3.8.8 Carcass use and Disposal.
- 3.9 All equipment used for euthanasia must be well maintained, used correctly, and not overloaded.
- 3.10 Prior to being euthanized, birds must be handled in a manner that minimizes pain and suffering.
- 3.11 Mass depopulation of animals will be outsourced to a specialized company.

4. EUTHANASIA METHODS

Euthanasia must result in a **quick death without pain or distress**. The method depends on the number and type of birds being culled and it must be performed by **competent personnel**.

4.1 **MANUAL CERVICAL DISLOCATION** (recommended for groups under 10 animals)

- 4.1.1 Cervical dislocation is a conditionally acceptable method of euthanasia. Animals should be anesthetized prior to cervical dislocation, unless otherwise justified and approved by the Animal Care Committee.
- 4.1.2 Cervical dislocation must only be performed by trained individuals.
- 4.1.3 This method is restricted to smaller birds (e.g. ≤ 3 kg).
- 4.1.4 Operator fatigue can result in a euthanasia technique being delivered in an unreliable manner therefore, this technique must not be considered for depopulating large groups of birds.
- 4.1.5 **PROCEDURE FOR CHICKENS AND POULTS >7 days old:**
 The goal of cervical dislocation is to sever the spinal cord and separate the vertebrae so that the bird does not recover consciousness.



Figure 1

STEP 1: Pick up the bird by placing your hands over the top part of the wings (shoulders). Hold under arm to keep wings in place. Support the feet with one hand and restrain the legs between three fingers of the other hand. Never handle a chicken by its wings.

STEP 2: Hold it until it is calm. (Fig.1)

STEP 3: Hold the bird above the hocks for good control of the body and to decrease the chance of causing injury. (Fig.2)



Figure 2

STEP 4A: With your dominant hand, hold head by placing first two fingers on either side of the neck, against the bony outcroppings of the skull near the ears. (Fig.3)



Figure 3

STEP 4B: ALTERNATIVE GRIP: hold head by placing the thumb and index finger around the neck, at the base of the head. This is an acceptable grip, provided the head of the bird can be flexed towards its back sufficiently. (Fig.4)



Figure 4

STEP 5: Anchor the bird's legs against your body. (Fig.5)

STEP 6: Position the bird's head by bending backward until it is perpendicular to its back.

STEP 7: In a single, smooth motion, apply increasing force to stretch the neck as far as it will go then snap the head back sharply to separate the vertebrae and sever the spinal cord. To perform cervical dislocation correctly, the cervical vertebrae must be separated (dislocated), not crushed.

STEP 8: Hold the bird until the involuntary movements have stopped.

STEP 9: Ensure the procedure has been correctly performed by feeling the disconnect of the neck directly behind the skull. When performed properly, this technique results in a dislocation of the skull from the first vertebra. (Figures 6 and 7)



Figure 5. Anchor bird against your body/legs



Figure 6. Ensure the dislocation of the skull from the first vertebra.

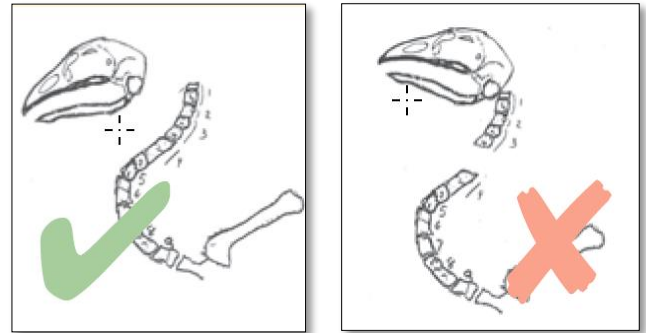


Figure 7. Cervical dislocation requires damage to the brainstem

4.1.6 PROCEDURE FOR CHICKS & POULTS LESS THAN 7 DAYS:

STEP 1: Place the bird's chin on a narrow, strong edge. (Fig.8)

STEP 2: Press firmly on the back of the neck where the skull joins the neck. This will cause the vertebra to separate from the skull resulting in unconsciousness and death.

STEP 3: Ensure the procedure has been correctly performed by feeling the disconnect of the neck directly behind the skull.

STEP 4: Death must be confirmed before the disposal of birds. (Refer to Section 4.6)



Figure 8. Place bird's chin on a narrow, strong edge.

4.2 MECHANICAL CERVICAL DISLOCATION: (only for SMALL GROUPS)

For all classes of poultry.

- 4.2.1 Operator fatigue can result in a euthanasia technique being delivered in an unreliable manner therefore, this technique must not be considered for depopulating large groups of birds.
- 4.2.2 Operators must possess sufficient strength to easily close the jaws of the tool in one motion.
- 4.2.3 The device must be proven effective by a veterinarian or published scientific paper for the size and type of bird it will be used upon.
- 4.2.4 The device must be purpose-designed and appropriate for the size of bird.
- 4.2.5 The device must not be modified in any way and must be well maintained.
- 4.2.6 The device must be used according to the manufacturer's recommendations.



Figure 9. Apply the device as close to the head as possible, with the handles in a vertical position

4.2.7 PROCEDURE:

- 4.2.7.1 Restrain the bird placing your hands over the top part of the wings (shoulders) to facilitate the proper placement of the device.
- 4.2.7.2 Apply the device as close to the head as possible, with the handles in a vertical position. (Figures 9 and 10)
- 4.2.7.3 Close the jaws of the device in a vigorous, swift, and uninterrupted motion.
- 4.2.7.4 Ensure the procedure has been correctly performed by feeling the disconnect of the neck directly behind the skull.
- 4.2.7.5 Death must be confirmed before disposal of birds. (refer to Section 4.6)

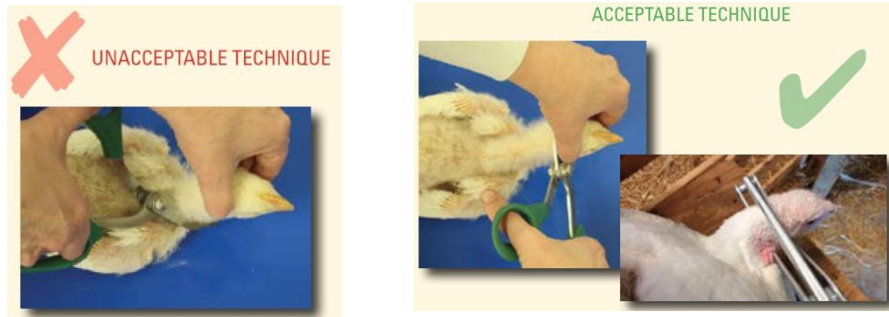


Fig. 10. Placement of mechanical cervical dislocation device

4.3 DECAPITATION:

4.3.1 Decapitation is a conditionally acceptable method of euthanasia and should only be applied as a secondary physical means for the confirmation of death unless otherwise scientifically justified and approved by the Animal Care Committee.

4.3.2 Instruments must be of appropriate size and sharpness to cut through the neck swiftly and smoothly. Blades must overlap when closed, not merely meet. The sharpness of the blade must be assessed before performing the procedure.

4.3.3 Procedure:

- 4.3.3.1 Restraint the animal securely
- 4.3.3.2 Place the cutting instrument as close to the head as possible. (Refer to figure 11)
- 4.3.3.3 Use one swift motion to cut the neck, resulting in complete severance of the head. The neck must be cut and not crushed in the procedure.



Figure 11.

4.4 GAS INHALATION

For all classes of poultry

- 4.4.1 It is preferable to anesthetize animals with isoflurane prior to exposure to CO₂ to minimize pain and distress.
- 4.4.2 Gas euthanasia should be followed by other, physical methods (i.e. cervical dislocation) to ensure death.
- 4.4.3 Assure that adequate quantities of gas are available and that all equipment is functioning properly.
- 4.4.4 Ensure proper scavenging of anesthetic gases
- 4.4.5 Use compressed CO₂ from cylinders: dry ice is not permitted as a CO₂ source.
- 4.4.6 Use a chamber that is clear so that the bird can be observed.
- 4.4.7 **ISOFLURANE FOLLOWED BY A PHYSICAL METHOD (Acceptable method):**
 - 4.4.7.1 Place the birds in the chamber in a single layer. Do not overcrowd the chamber.
 - 4.4.7.2 Ensure that the chamber lid is securely closed,
 - 4.4.7.3 Administer 5% isoflurane anesthesia at a maximum oxygen flow rate.
 - 4.4.7.4 Maintain until the animal is immobile and unresponsive.
 - 4.4.7.5 Remove the animal from the chamber
 - 4.4.7.6 Apply a secondary, physical method of euthanasia (e.g., cervical dislocation) to confirm death.
 - 4.4.7.7 Sanitize the chamber after each session.
- 4.4.8 **ISOFLURANE FOLLOWED BY CO₂ AND A PHYSICAL METHOD (Acceptable Method)**
 - 4.4.8.1 Place the birds in the chamber in a single layer. Do not overcrowd the chamber.
 - 4.4.8.2 Ensure that the chamber lid is securely closed,
 - 4.4.8.3 Administer 5% isoflurane anesthesia at a maximum oxygen flow rate.
 - 4.4.8.4 Maintain until the animal is unconscious and the respiration rate is still relatively high.
 - 4.4.8.5 Immediately Introduce CO₂ at a displacement rate of 30% and maintain until indications of death (cessation of movement and rhythmic breathing) are observed.
 - 4.4.8.6 Increase CO₂ concentration and maintain until indications of death (cessation of movement and rhythmic breathing) are observed.
 - 4.4.8.7 Remove the animal from the chamber and assess for signs of sensibility as described in section 4.7.
 - 4.4.8.8 Apply a secondary physical method of euthanasia (e.g., cervical dislocation) to confirm death.
 - 4.4.8.9 Flush out the chamber and sanitize after each session.
- 4.4.9 **CO₂ Asphyxiation**

CO₂ asphyxiation is a conditionally acceptable method of euthanasia. Animals should be anesthetized prior to CO₂ exposure with the exception that it is otherwise justified and approved by the Animal Care Committee, under the direction of a veterinarian, or for mass depopulation as indicated in section 3.11.

 - 4.4.9.1 Place the birds in the chamber in a single layer. Do not overcrowd the chamber.
 - 4.4.9.2 Set the CO₂ flow to a displacement rate of 10-30% of the chamber volume per minute.
Note: Concentrations of CO₂ greater than 30% may cause pain and respiratory distress before loss of consciousness.

- 4.4.9.3 Newly hatched chicks have a greater tolerance to high concentrations of CO₂ so a concentration of 60-70% (AVMA = 80-90%) with prolonged exposure will be required to produce death (e.g., up to 5 minutes)
- 4.4.9.4 Once the animals lose consciousness, increase CO₂ concentration and maintain it until indications of death (cessation of movement and rhythmic breathing) are observed.
- 4.4.9.5 Remove the animal from the chamber and assess for signs of sensibility as described in section 4.7.
- 4.4.9.6 Apply a secondary method of euthanasia (e.g., cervical dislocation) to confirm death.
- 4.4.9.7 Flush out the chamber and sanitize after each session.

4.5 INJECTABLE ANESTHETIC OVERDOSE:

- 4.5.1 Apply to chicken > 1 week old
- 4.5.2 Because these drugs are controlled substances they must be administered by personnel who are registered on the Health Canada exemption licence. Strict record keeping is required of all who use and store these drugs
- 4.5.3 Anesthetics should be injected intravenously unless the animal is too small.
- 4.5.4 PROCEDURE:
 - 4.5.4.1 Administer a sedative as described in an Approved animal Use Protocol and/ or in consultation with a veterinarian. (Refer to SOP [PU-602: Substance Administration for Poultry](#))
 - 4.5.4.2 Place the bird in a small cage in a quiet area to minimize excitement and trauma, as birds may be slow to become sedated.
 - 4.5.4.3 Gently and quietly pick up and restrain the bird.
 - 4.5.4.4 Administer Sodium Pentobarbital intravenously (IV) at a dose of 120 mg/kg.
 - 4.5.4.5 The intraperitoneal route can be used for smaller animals.
- 4.5.5 Apply a secondary physical method of euthanasia (e.g., cervical dislocation) to confirm death.
- 4.5.6 Where barbiturates have been used, carcasses must be properly identified for disposal; they must not enter the food or feed chain.

4.6 EMBRYOS, EGGS:

- 4.6.1 For embryos, eggs >50% gestation, use methods appropriate for hatched birds (e.g., decapitation, overdose of anesthetic).
- 4.6.2 For embryos, eggs <50% gestation, (under field conditions), destroy the viability of eggs by one of the following methods: shaking, puncturing, freezing, or coating eggs with oil.

4.7 CONFIRMATION OF INSENSIBILITY AND DEATH

- 4.7.1 Assess the bird(s) for signs of sensibility after the euthanasia method has been applied.
- 4.7.2 If signs are observed, then a second application of the euthanasia method or an alternate method must be IMMEDIATELY applied.
- 4.7.3 Death must be confirmed on EVERY bird (except if the decapitation method is used) before leaving birds and disposing of carcasses.
- 4.7.4 Signs of loss of successful euthanasia:
 - 4.7.4.1 Absence of corneal reflex: (Fig 12 and 13)



Fig.12 The bird does not blink when the surface of the eye is touched.



Fig.13 Dilated and fixed pupil is a sign of unconsciousness and/or death.

- 4.7.4.2 Absence of neck muscle tone. The lack of reflex to raise the head indicates deep unconsciousness or death. Death should be confirmed with other methods such as absence of corneal reflex. (Figures 14 and 15)



Fig.14 Absence of muscle tone - adult



Fig.14 Absence of muscle tone - chick

- 4.7.4.3 No breathing (check for abdominal movement in the vent area).
 - 4.7.4.4 No vocalization (other than exhalation that occurs when the lungs deflate).
 - 4.7.4.5 No jaw tone.
 - 4.7.4.6 Absence of heartbeat.
- 4.7.5 Following confirmation of death, all anatomical waste must be disposed of in the appropriate waste containers and in accordance with McGill University's Biosafety Program. Refer to SOP PU-116: Carcass disposal.

5. REFERENCES

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