

Practical Guidelines for On-Farm Euthanasia of Poultry



2nd Edition - Published in 2016



Introduction

This booklet contains techniques that meet the requirements described in the 2013 Edition of the AVMA Guidelines for the Euthanasia of Animals, and the 2016 Canadian Code of Practice for the care and handling of Hatching Eggs, Breeders, Chickens and Turkeys.

The techniques described in this booklet take into account the conditions imposed on each method of euthanasia. When these techniques and instructions are followed, the methods are considered humane. If alternate techniques are used, they must be implemented with the advice of a veterinarian. This manual is a living document that will be updated as knowledge and standards change. Please ensure you are using the most current version.



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Warning: This booklet contains graphic images.

What is Euthanasia?

Euthanasia is the ending of the life of an individual animal in a way that minimizes or eliminates pain, anxiety and distress. Euthanasia means a good death for the animal.

When is euthanasia appropriate?

Euthanasia is a critical part of an effective on-farm animal welfare program. Proper euthanasia, done at the right time, reduces suffering due to disease, pain from injury and distress from ill thrift. The decision to euthanize is subjective, and depends on farm management practices and experience. Sick or injured birds must be treated or euthanized without delay if they:

- Are unlikely to recover
- Fail to respond to treatment and convalescent protocols
- Have chronic, severe or debilitating pain and distress
- Are unable to access feed and water
- Show emaciation or lack of body condition

What are the criteria for a procedure to qualify as euthanasia?

Any method of euthanasia must be done with respect, and with an emphasis on a painless and distress free death.

Any technique used must result in rapid and irreversible loss of consciousness followed by cardiac or respiratory arrest and, ultimately, a loss of brain function. Animal handling and euthanasia technique must minimize distress experienced by the animal before they lose consciousness.

Mechanisms of euthanasia

Euthanasia occurs when the brain is unable to sense its surroundings, followed by the shutting down of body processes, causing the animal to die. Quickly making the bird unconscious is a criteria of euthanasia. This is accomplished by interfering with the brain's ability to communicate with the body, depriving the brain of oxygen or physically damaging the brain. Confirmation of death is an important step in euthanasia. All birds should be confirmed dead following the application of a euthanasia technique.

Handling and restraint

Proper handling and restraint minimize stress on the bird, and reduce or eliminate the chance of an ineffective procedure. Proper restraint is crucial during any physical method of euthanasia, and will reduce the chance of injury to the personnel euthanizing the bird.

Criteria for measuring acceptability

Euthanasia methods are considered:

Acceptable:

- Methods that consistently produce a humane death when used as the sole means of euthanasia

Acceptable with conditions:

- Techniques that may require certain conditions to be met to consistently produce humane death
- Pose a greater risk for operator error or safety hazard
- May not be well supported in the scientific literature
- May require a secondary method to ensure death

Unacceptable:

- Methods deemed inhumane or not proven to be humane

Unvalidated methods:

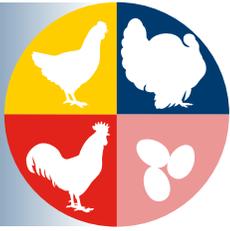
- Methods of euthanasia that have not been sufficiently studied to provide convincing evidence to establish whether they meet all the measures of acceptability are considered unacceptable
- Until methods are scientifically validated they cannot be recommended as a humane method of euthanasia
- Once a method has been validated, it will be included in the next version of this manual

For a technique to be considered acceptable as a method of euthanasia, it must:

- ✓ Render the bird unconscious quickly
- ✓ Be able to be administered in a reliable manner (repeatable)
- ✓ Cause the bird to die without regaining consciousness (irreversible)

Other considerations when choosing a method of euthanasia include:

- ✓ Safety for the operator
- ✓ Emotional impact on the operator
- ✓ Public's perception of the care given to the birds by the farmer
- ✓ Biosecurity concerns
- ✓ Economics



Euthanasia strategies: methods and restraint

MANUAL CERVICAL DISLOCATION

Use for chicks, poults, chickens and turkeys of appropriate size that operators can easily dislocate



Proper restraint of the bird is important for both effective euthanasia and worker comfort and safety. Restraint methods should result in as little fear and discomfort for the bird as possible, minimize the amount of time the bird is in restraint, and reduce the risk of unintended injury

Operator fatigue can result in a euthanasia technique being delivered in an unreliable manner, and must be considered when euthanizing large numbers of birds.



Hold bird above hocks for good control of body and to decrease the chance of causing injury.



Large birds (i.e. breeders or growing turkeys) may be restrained by the wings, if they are too large to be held by the legs during cervical dislocation.

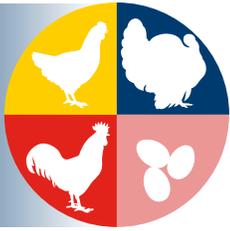


Hold head by placing first two fingers on either side of the neck, against the bony outcroppings of the skull near the ears. This grip allows for control of the head, while still enabling the user to put solid traction on the neck.



Alternative grip: hold head by placing the thumb and index finger around the neck, at the base of the head. Some users feel that this alternative grip lets them put more traction on the neck. This is an acceptable grip, provided the head of the bird can be flexed towards its back sufficiently.

Caution must be taken with laying hens because of the fragility of their bones, and wing restraint must not be used.



Euthanasia strategies: methods and restraint

MANUAL CERVICAL DISLOCATION (continued)

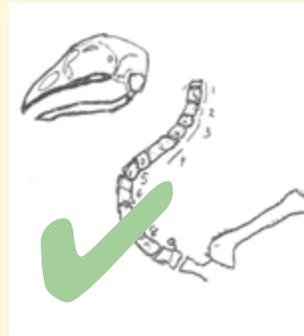
Use for chicks, poults, chickens and turkeys of appropriate size that operators can easily dislocate



Cervical dislocation requires damage to the brainstem to cause loss of consciousness. Death is caused by interruption of blood supply to the brain. If the brainstem is not damaged, unconsciousness occurs after a period of time that is too long to be considered humane, and results in death by suffocation.



1. Restrain bird as described on previous page.
2. Anchor the bird's legs against your body.
3. Position the bird's head by bending backwards until it is nearly perpendicular to its back.
4. Apply increasing force to stretch the neck until you feel the skull separate from the spine.
5. This should be a single, smooth motion.



When performed properly, this technique results in a dislocation of the skull from the first vertebrae. This results in the spinal cord separating from the brainstem. It is damage to the brainstem that results in rapid unconsciousness, and humane death.



If performed incorrectly, there will be bony structures still attached to the skull. This means that the brainstem will not be damaged, and the time to unconsciousness is extended. This is usually the result of the "wind-milling" method, and is unacceptable.

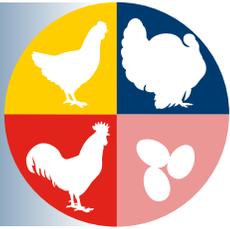


For chicks or poults less than seven days of age, placing the bird's chin on a narrow, strong edge, and pressing firmly on the back of the neck where the skull joins the neck will cause the first vertebra to separate from the skull, damaging the brainstem and vertebra resulting in unconsciousness and death.



When performed correctly, the operator will be able to feel the disconnect of the neck directly behind the skull. Feeling this disconnection is important in ensuring that the procedure has been done correctly, and the bird will not recover.

The bird's welfare is not compromised if the head is accidentally removed during cervical dislocation. There are biosecurity and aesthetic concerns to consider.



Euthanasia strategies: methods and restraint

MECHANICAL CERVICAL DISLOCATION

(For all classes of poultry for which there are purpose-made, effective devices available)



Mechanical Cervical Dislocation is an approved method of euthanasia for any poultry provided there is a device that has been proven effective for the size and type of bird it is to be used upon. Devices must not cause crushing of the bones of the neck.

A published scientific paper or a letter from a professional such as a veterinarian will provide verification that a tool has been proven effective. The farm must be confident that the device has been proven effective.



Only purpose-made devices that have been shown to properly dislocate the neck without crushing may be used. The device must not be modified in any way, and must be well maintained. The devices shown here are currently being studied.



Birds should be restrained by the wings or body to facilitate the proper placement of the device. The device must be the appropriate size for the bird, and used according to manufacturer's recommendations.



UNACCEPTABLE TECHNIQUE

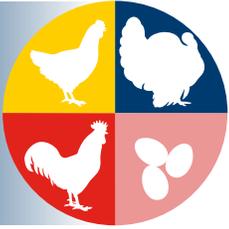


A device placed incorrectly, either low on the neck, or compressing the neck sideways, will not render the bird unconscious quickly, and will not be acceptable technique for euthanasia.

ACCEPTABLE TECHNIQUE



Mechanical CD devices must be applied as close to the head as possible, with the handles in a vertical position. The motion should be vigorous, swift and uninterrupted. Operators must possess sufficient strength to easily close the jaws of the tool in one motion.



Euthanasia strategies: methods and restraint

NON-PENETRATING/PENETRATING CAPTIVE BOLT

For all classes of poultry except chicks and poults



Captive bolt euthanasia makes the bird unconscious by physically damaging the brain by "concussing" the skull. It is not necessary to penetrate the skull for this to be effective. Unconsciousness is achieved immediately when the positioning and power of the blow are correct.



Restraint can be accomplished by a single operator with simple tools, or can be performed by two people.



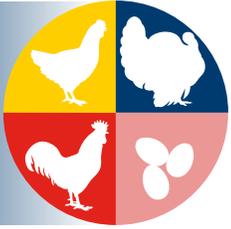
The captive bolt should be placed perpendicular to the skull, firmly against the head, between the ears and eyes, with the "chin" of the bird on an immobile surface unless otherwise instructed by the user's manual.



A captive bolt should be placed directly behind the comb firmly against the head, with the chicken's "chin" placed on a hard, immovable surface, unless manufacturer's instructions say otherwise. A non-penetrating captive bolt device should be deployed twice in rapid succession if the device allows it. A penetrating captive bolt only needs to be discharged once.



A captive bolt should be placed firmly on the top of the turkey's head, between the ears and eyes, with the turkey's "chin" on a hard, immovable surface, unless manufacturer's instructions say otherwise. A non-penetrating captive bolt gun should be deployed twice in rapid succession if the device allows it. A penetrating captive bolt only needs to be discharged once.



Euthanasia strategies: methods and restraint

NON-PENETRATING/PENETRATING CAPTIVE BOLT (continued)

For all classes of poultry except chicks and poults



Captive bolt devices must be maintained and oiled as per manufacturer's instructions. The heads of the devices must be cleaned after each euthanasia session to ensure proper bolt action.



Captive bolt device should be placed over the cerebral cortex of the bird, along the midline of the skull.

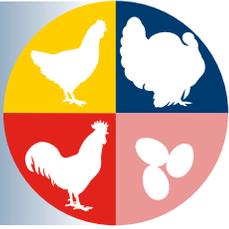


Non-penetrating captive bolts apply blunt force trauma to the head of the bird by using a blunt plunger that extends a small distance outside a cylinder.



Penetrating captive bolts extend further from the cylinder, penetrating the skull and causing damage to the deeper parts of the brain.

Take care when handling and using captive bolt devices. They are safer than firearms, but without proper care and maintenance, captive bolt devices can injure operators or bystanders.



Euthanasia strategies: methods and restraint

DECAPITATION

For all classes of poultry



Decapitation results in rapid unconsciousness by damaging the nervous system and disrupting the flow of fluid that supports the brain. Death results from lack of blood flow. Ensure rapid unconsciousness by completely severing the head from the neck.



Decapitation is effective and humane provided that 1) the blade used is well maintained and sharp, 2) the head is removed in one swift cut, and 3) the neck is cut and not crushed in the procedure.



Cutting cones are an effective method of restraining birds before euthanasia, and are useful in containing the bodily fluids lost during the procedure. Birds should not be in the cone any longer than necessary.

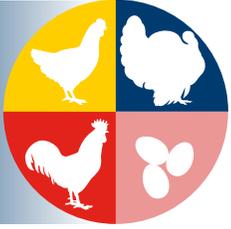


Large cutting cones are effective for turkeys. Shears are effective for decapitation and improve worker safety. Shears must be sharp, and the blades must overlap when closed, not merely meet.

Decapitation carries biosecurity risks due to the release of fluids from the cut. Have a plan in place to prevent the spread of any disease that might be present.

Prolonged restraint in a cutting cone can cause suffocation and is unacceptable. Have a plan to minimize the amount of time a bird is in the cone before euthanasia occurs.

Consider worker safety with euthanasia plans. Using safe restraints, sharp tools and protective equipment such as chainmail gloves is crucial.



Euthanasia strategies: methods and restraint

DECAPITATION (continued)

For all classes of poultry



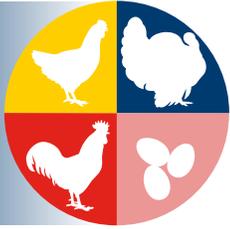
If shears or scissors are used for decapitation, they must be of appropriate size and sharpness to cut through the neck in one swift, smooth motion.



Decapitation of young chicks can be accomplished humanely with a sharp pair of scissors.



Decapitation of young poults can be accomplished humanely with a sharp pair of scissors.



Euthanasia strategies: methods and restraint

BLUNT FORCE TRAUMA

For large birds where other methods are not practical



Blunt force trauma is the delivery of a sharp blow to a large bird's head, resulting in brain damage and immediate unconsciousness. Death results from a lack of breathing, or a secondary method of euthanasia performed after the bird is rendered unconscious by the blow. Consistency of this procedure is crucial so that each blow is effective in stunning the bird, and misses do not occur. The negative effects of this procedure on the operator and external observers must be considered when evaluating this method for on-farm euthanasia.



Blunt force trauma is an effective method of euthanasia provided that birds are restrained so the strike is direct, repeatable and reliable. Minimize the chance of missed strikes for bird welfare and worker safety.

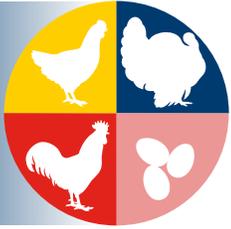


When applying blunt force trauma, the blow should be vertical, landing on the top of the bird's head. Use enough force to make the bird unconscious with one blow. Operator training is critical to ensure that blunt force trauma is consistent and reliable.



An effective tool for blunt force trauma must be large enough to consistently contact the head of the bird, heavy enough to deliver a severe blow that renders the bird unconscious with one strike, and be reliably aimed and controlled.

The most important welfare concern with blunt force trauma is the control and repeatability of the procedure. Operators must use proper tools, and be VERY careful that the number of missed hits are minimized or eliminated. Blunt force trauma is only humane if the bird is made unconscious by a single blow.



Euthanasia strategies: methods and restraint

CO₂

For all classes of poultry, with special consideration for chicks and poults



Exposure to carbon dioxide (CO₂) gas results in alterations in blood chemistry (acidosis), which depresses the breathing centres. Lack of oxygen causes unconsciousness and death. High concentrations of CO₂ have been shown to cause distress to poultry, and where possible, inert gasses such as nitrogen and argon are preferred.



CO₂ chambers are available commercially, or can be custom built. All units must be airtight, have a regulator to control gas flow, a sensor or alarm that registers low concentrations and exhaust valves to prevent over-pressurization.



If using a commercially produced chamber, follow manufacturer's directions for gas administration. If the chamber is custom built, gradual introduction of gas is preferred to cause less distress to the birds. Consult your veterinarian or qualified advisor to develop a fill rate that suits the chamber used.



Maximum density of birds in a chamber should not exceed space requirements for shipping.



A viewing window allows the operator to ensure that the birds are unconscious before decreasing CO₂ concentrations.

Ensure the birds don't suffer from cold while the CO₂ is put into the chamber. Introducing gas too quickly causes extreme temperature drops that are unacceptable. Adding a heater coil to the supply line can prevent interruption of gas due to freezing.

ALL birds should be confirmed dead when removed from the chamber. Use a secondary method of euthanasia before birds regain consciousness if the birds are not dead. A secondary method may be re-application of CO₂ at different concentration or exposure time.

Always consider worker safety when using CO₂ and ensure chambers are in a well ventilated area. Training is required to control exposure to CO₂ and to safely handle compressed gasses.

Commodity specific organizations and veterinarians are good resources for reliable sources of euthanasia equipment.

UNACCEPTABLE METHODS FOR ON-FARM EUTHANASIA

Any strategy for euthanasia that does not reliably and rapidly induce unconsciousness, is not consistently irreversible, or is dangerous to operators is unacceptable.

Unacceptable methods of euthanasia include, but are not limited to:

- X** Drowning
- X** Exsanguination (bleeding out, without first stunning the bird)
- X** Suffocation
- X** Vehicle exhaust
- X** Freezing
- X** Poisons (including potassium chloride)
- X** Blunt force trauma where the bird is struck against a surface, rather than striking the bird with a tool
- X** Incorrect application of any approved method

VERIFICATION OF NEW OR EMERGING METHODS

Research and innovation is being done on various novel methods of euthanasia to improve on current best practices.

Any emerging or innovative technique must be compared against currently acceptable methods. For example, a method of euthanasia that produces loss of signs of consciousness (such as reflexes) as quickly and reliably as an approved method, will be considered to be humane. Any novel method of euthanasia must have evidence from numerous birds and qualified third-party verification to demonstrate it is comparable to accepted current methods of euthanasia for rendering birds unconscious and irreversibility of death. This verification is required for the adoption of effective innovative methods of euthanasia. Any novel method must be compliant with the Canadian Code of Practice, all applicable laws and be verified by a veterinarian.

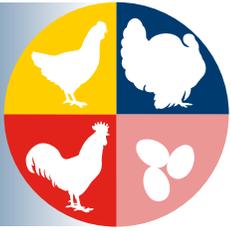
Anyone performing euthanasia must understand that killing an animal in an inhumane manner may result in charges under various animal protection agencies across Canada. All farmers must be aware of the regulations in their jurisdiction, as well as the penalties for breaking them.

For example, in Ontario:

Any person using an unacceptable method of euthanasia is contravening the Standard of Care Regulation, OSPCA Act.

“Every animal that is to be killed must be killed by a method that is humane and minimizes the pain and distress to the animal; an animal’s pain and distress are deemed to be minimized if it is killed by a method that produces rapid, irreversible unconsciousness and a prompt subsequent death.”

In Ontario, under the OSPCA Act, penalties for contravening this act can include fines up to \$60,000 and/or imprisonment for up to two years, and a lifetime ban from owning animals.



Confirmation of loss of consciousness and death

After any method is used to euthanize a bird, ensure the procedure has been done properly and the bird is unconscious, and then, ultimately, dead. Confirmation of euthanasia must be done on EVERY chicken or turkey that is humanely killed. If signs of consciousness are noted, immediately apply a secondary technique to accomplish euthanasia. Depending on the situation, the alternate technique may be a reapplication of the first method, or an alternate, approved method may be required.

LACK OF NICTITATING MEMBRANE REFLEX (third eyelid)



The third eyelid reflex stays active until very close to brain death, and is an effective tool to determine success of euthanasia in the field.



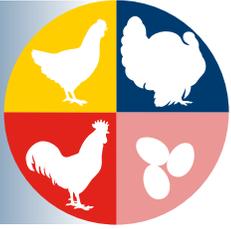
Response of a conscious bird to a finger gently touching the edge of the eye.



When the reflex is absent, the bird can be considered dead and euthanasia has been successful.



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



Confirmation of loss of consciousness and death

LACK OF NECK MUSCLE TONE



Conscious birds will attempt to raise their heads above the level of their body.



Lack of reflex to raise the head indicates deep unconsciousness or death. Death should be confirmed with other methods such as third eyelid check.



Lack of reflex to raise head indicates deep unconsciousness or death. Death should be confirmed with other methods such as third eyelid check.



Death must also be confirmed in chicks.

COLLAPSE AND CONVULSIONS

When a bird becomes unconscious, it loses posture and collapses. Convulsions may also occur, but are not coordinated efforts from the bird to stand or right itself. This indicates unconsciousness, but other assessments should be used to confirm death.

JAW TONE DISAPPEARS

With experience, jaw tone can be used to assess unconsciousness. This is subjective and should be paired with other assessments to ensure death.

LACK OF RESPONSE TO PAIN

Pinching the comb or toes should not result in any response by the bird. Withdrawal of the head or foot after pinching is an indication the bird should be reassessed and corrective action taken.

FARMS MUST ALWAYS BE PREPARED WITH AN ALTERNATE APPROVED METHOD OF EUTHANASIA IN CASE THE PRIMARY STRATEGY FOR EUTHANASIA FAILS. THIS ALTERNATE METHOD MUST BE IMPLEMENTED QUICKLY. FAILURE OF A EUTHANASIA ATTEMPT RESULTS IN A COMPROMISED BIRD THAT MUST BE EUTHANIZED AS QUICKLY AS POSSIBLE.

SECONDARY CONSIDERATIONS AROUND METHODS

When properly applied, any of the methods in this manual are humane for the animal. There is no perfect method of euthanasia for poultry, and research continues on improving methods of euthanasia. Every method has its strengths and weaknesses, and decisions for the best method must be made on a farm-by-farm basis. The following guidelines may help in evaluating the applicability of each method on any individual farm.

-  Green boxes indicate a lower risk of negative consequences in the areas indicated.
-  Yellow boxes indicate a moderate risk of negative consequences.
-  Red boxes are a higher risk of negative outcomes.

Method of Euthanasia	Considerations	Biosecurity Risk	Risk to Human Safety	Public Perception	Effect on Worker
Manual Cervical Dislocation	Effective only in smaller birds. Operator strength and technique determine effective weight limits for this technique.				
Mechanical Cervical Dislocation	The device must dislocate the neck vertebrae, not cause crushing of the bones of the neck, and be comparable to manual cervical dislocation with respect to time to loss of consciousness.				
Non-Penetrating Captive Bolt	Not practical for chicks or young poults. Elaborate equipment and maintenance protocols required.				
Penetrating Captive Bolt	Not practical for chicks or young poults. Elaborate equipment and maintenance protocols required.				
CO ₂	Elaborate equipment and maintenance protocols required. CO ₂ causes distress to birds if not applied properly. Necessary exposure time can be variable.				
Decapitation	Properly maintained equipment is effective for all classes of poultry. There are concerns for biosecurity due to blood loss.				
Blunt Force Trauma	High level of control and repeatability of the procedure are crucial.				

Practical Guidelines for On-Farm Euthanasia of Poultry



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