



# Euthanasia

## General Protocol

- Euthanasia procedures and techniques on this farm are selected from methods approved by the American Association of Swine Veterinarians and the National Pork Board. Approved methods are summarized in the booklet “On-Farm Euthanasia of Swine: Recommendations for the Producer.”
- Caretakers who are responsible for euthanasia should always be aware of human safety and choose methods that do not put caretakers at unnecessary risk (National Pork Board, 2016).
- The chosen method should minimize pain and distress of the pig during administration (National Pork Board, 2016).
- The steps to complete a euthanasia action on the farm will consist of: creating a plan to complete euthanasia, checking to make sure equipment to be used is functioning properly, completing euthanasia following approved guidelines, and confirming insensibility and death.
- All caretakers responsible for euthanasia will receive proper training to correctly complete euthanasia tasks. This information will be reviewed on an annual basis.
- A caretaker properly trained in euthanasia will be available at all times to complete the task. If a trained caretaker is not at the farm and euthanasia is needed, a trained caretaker will be called in.
- The procedures used will be selected from approved methods based on suitability for the size of the pig and the training of the caretaker responsible.
- Euthanasia equipment will be properly stored and maintained, maintenance will be completed monthly on all equipment, and a written record of this will be kept by caretakers.
- Pigs shall be provided with adequate medical attention when they are injured or ill. Pigs that remain in distress in spite of 2 days of intense medical attention and are not responding to care, pigs that are immobilized and with a body condition score of 1, or those pigs that will not recover must be humanely euthanized to avoid unnecessary suffering.
- Euthanasia should be done in a timely, appropriate, and humane manner. A pig that may be compromised, doing poorly, nonambulatory, nonresponsive to treatment, or severely ill or injured should be evaluated as a potential candidate for euthanasia. The goal of timely euthanasia is to minimize the pain and distress of the pig (National Pork Board, 2015).

There are multiple ways to perform euthanasia on pigs. The procedures on the following pages summarize the approved methods so that a customized standard procedure can be developed.





## Manual blunt force trauma (MBFT)

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Use this method with pigs that weigh 12 pounds or less. This method is effective for a pig of this weight because the skull bones are thin, and force will cause depression of the central nervous system and brain damage (National Pork Board, 2016). Use a different method with pigs heavier than 12 pounds.

### Procedure for MBFT euthanasia:

- Identify the pig to be euthanized according to farm protocol.
- Hold the pig firmly with two hands by both of the hind legs above the hock. The abdomen of the pig should face away from you. Swing the pig quickly and firmly so that the top of the head strikes against a flat, solid object. A blunt object of sufficient form and size should be used to provide humane death with a single blow. Examples of this include a cement floor or cement abutment.
- Avoid areas such as mesh flooring or metal or plastic stall sides where the impact is absorbed by the buoyancy of the material or there is not enough surface area to properly connect with the animal.
- The blow must be administered firmly and swiftly and with absolute determination. Loss of consciousness is rapid when the method is performed properly (National Pork Board, 2016).
- Observe the pig for stages of death. The pig's body will usually become extremely tense after the initial blow, followed by gradual relaxation. This phase is typically followed by involuntary kicking or paddling actions for a minute or two (National Pork Board, 2016).
- The caretaker should confirm insensibility within 30 seconds after the euthanasia procedure is performed and insensibility should be monitored and maintained until death (National Pork Board, 2016).
- The pig should be confirmed dead before it is moved for disposal. Vital signs should be checked within 3 minutes after the euthanasia method has been completed (National Pork Board, 2016).
- Remove euthanized pigs from the barn for proper disposal.

## Nonpenetrating captive bolt (NPCB)

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This method uses re-engineered nail guns connected to an air compressor charged to 120 pounds per square inch (psi). NPCB is approved for suckling pigs and pigs up to 20 pounds.

When the NPCB gun is fired, a nylon bolt is ejected from the barrel, causing brain damage on impact due to concussive force of up to 120 psi. To effectively use an NPCB, there must be an air compressor hook-up. Advantages of this system include that it is effective, lightweight, and generally safe for caretakers to use.

### Procedure for NPCB euthanasia:

- Place the pig in the sternal (stomach) position on a sturdy, hard, flat surface. This is important as softer materials will absorb the impact and reduce the concussive force needed (see Figure 1).
- Manually restrain pigs with one hand over the back of the neck, firmly pressing down to secure the pig. Take note of your hand placement so you do not fire the gun and bruise your hand.
- With the other hand or with an assistant, apply the NPCB gun firmly against the frontal bone between and slightly above the centerline of the eyes. Depress the trigger to fire the NPCB gun.
- After an effective shot, the pig will display tonic (muscle tightening) and clonic (muscle relaxation) movements, or involuntary kicking or paddling movements for up to 2 minutes.



- Pigs that do not initially demonstrate tonic activity but immediately show paddling, kicking, or organized limb movements have been ineffectively stunned and the procedure should be administered again immediately (National Pork Board, 2016).
- Due to the rapid speed of the NPCB and minimal costs, a double knock (fired twice in rapid succession) is recommended.
- Observe the pig for stages of death. The pig's body will usually become extremely tense after the initial blow, followed by steady relaxation. This stage is typically followed by involuntary kicking or paddling actions for up to 2 minutes (National Pork Board, 2016).
- The caretaker should confirm insensibility within 30 seconds after the euthanasia procedure is performed and should be monitored and maintained until death (National Pork Board, 2016).
- The pig should be confirmed dead before it is moved for disposal. Vital signs should be checked within 3 minutes after the euthanasia method has been completed (National Pork Board, 2016).
- Remove euthanized pigs from the barn for proper disposal.

## Penetrating captive bolt (PCB)

This method uses a sharp-rimmed, concave bolt that extends and penetrates the skull to cause concussive and physical damage to the skull and brain upon impact (National Pork Board, 2016).

When fired, a nylon bolt is ejected from the barrel, causing brain damage on impact due to concussive force of up to 120 psi. To effectively use a NPCB there must be an air compressor hook-up. Advantages of this system include effectiveness, lightweight, and generally safe for caretakers to use.

### Procedure for PCB euthanasia:

- Manually restrain pigs with a snare firmly around the nose to secure the pig. Take note of your hand placement so you do not fire the gun and bruise your hand.
- With the other hand or with an assistant, apply the PCB gun firmly against the frontal bone between and slightly above the centerline of the eyes. Depress the trigger to fire the PCB gun.
- After an effective shot, the pig will display tonic (muscle tightening) and clonic (muscle relaxation) movements, or involuntary kicking or paddling movements for up to 2 minutes.
- Pigs that do not initially demonstrate tonic activity but immediately show paddling, kicking, or organized limb movements have been ineffectively stunned and the procedure should be administered again immediately (National Pork Board, 2016).
- Due to the rapid speed of the PCB and minimal costs, a double knock (fired twice in rapid succession) is recommended.



Figure 1. Captive bolt placement on pig



- Observe the pig for stages of death. The pig's body will usually become extremely tense after the initial blow, followed by steady relaxation. This stage is typically followed by involuntary kicking or paddling actions for up to 2 minutes.
- The caretaker should confirm insensibility within 30 seconds after the euthanasia procedure is performed and should be monitored and maintained until death (National Pork Board, 2016).
- The pig should be confirmed dead before it is moved for disposal. Vital signs should be checked within 3 minutes after the euthanasia method has been completed (National Pork Board, 2016).
- Remove euthanized pigs from the barn for proper disposal.

## Gunshot

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A gunshot to the head is an effective method of euthanasia of swine because if done correctly, the impact caused by the penetrating bullet causes concussion and damage to vital areas of the brain of the pig (National Pork Board, 2016).

The type of gun and load needs to be large enough so the method is effective with the first shot. Ammunition choice is essential and must have adequate energy to concuss and penetrate the pig's skull with the first shot (National Pork Board, 2016). A 12-, 16-, or 20-gauge shotgun can be used for grow-finish pigs and mature sow and boars effectively (National Pork Board, 2016).

### **Procedure for gunshot euthanasia:**

- Manually restrain pigs with a snare, firmly holding against the pig's weight to secure the pig. Take note of your hand placement so you do not fire the gun and bruise your hand.
- With the other hand or with an assistant, apply the gun 2 to 10 inches away from the pig's skull. Target the gunshot roughly half an inch above the pig's eye level. Depress the trigger to fire the gun.
- An alternative target for a gunshot is behind the ear, aiming downward toward the head, the prime location to sever the brainstem.
- After an effective shot, the pig will display tonic (muscle tightening) and clonic (muscle relaxation), or involuntary kicking or paddling actions for up to 2 minutes.
- Pigs that do not initially demonstrate tonic activity but immediately show paddling, kicking, or organized limb movements, have been ineffectively stunned and the procedure should be administered again immediately (National Pork Board, 2016).
- Due to the rapid speed of the gunshot and minimal costs, a double knock (fired twice in rapid succession) is recommended.
- Observe the pig for stages of death. The pig's body will usually become extremely tense after the initial blow, followed by steady relaxation. This phase is typically followed by involuntary kicking or paddling actions for up to 2 minutes.
- The caretaker should confirm insensibility within 30 seconds after the euthanasia procedure is performed and insensibility should be monitored and maintained until death (National Pork Board, 2016).
- The pig should be confirmed dead before it is moved for disposal. Vital signs should be checked within 3 minutes after the euthanasia method has been completed (National Pork Board, 2016).
- Remove euthanized pigs from the barn for proper disposal.



## Carbon dioxide (CO<sub>2</sub>)

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CO<sub>2</sub> replaces oxygen in the body and causes rapid onset of anesthesia with subsequent death due to respiratory arrest. Although unconscious, pigs may experience involuntary vocalizations and movements when carbon dioxide is used correctly (National Pork Board, 2016).

### Procedure for carbon dioxide euthanasia:

- Use an enclosed and airtight container large enough for the size of the pigs. The floor of the container should be a nonslip surface (National Pork Board, 2016).
- The container must be equipped with inlet and outlet valves. Carbon dioxide is heavier than air. The container's outlet valve should be located at the top. This way, the container can be completely filled with carbon dioxide while the air displaced is allowed to escape. Ensure the area where euthanasia is to be performed is well ventilated. The container must have a regulator to control the release of gas (National Pork Board, 2016).
- Place the pigs to be euthanized into the container and close the lid. Depending on their size, more than one can be euthanized at a time. Ensure the lid is firmly secured.
- Open the valve fully (rapidly flushing) until pigs are unconscious. Leave the container sealed for 5 minutes.
- Some vocalizing and thrashing will occur after 20 to 25 seconds and may last up to 1 minute. Convulsions may occur after the pigs are insensible (unconscious) and therefore is not a sign of distress.
- After the 5 minutes, remove the lid and ensure the pigs are dead by checking to ensure they are not breathing and the eyes are nonresponsive to touching the inner corners of the eyelids.
- If there is **any** hesitation whether the pig is dead, the procedure must be repeated or if the pig is insensible but not dead, use a secondary method such as blunt force trauma or exsanguination to ensure death.
- Remove euthanized pigs from the barn for proper disposal.

## Secondary Steps

**Secondary step to ensure euthanasia is complete** – All farms will identify a secondary form of euthanasia to use in cases where the initial euthanasia has failed. These secondary steps are only for use after the pig has been stunned and is unconscious and must not be used as a primary method of euthanasia. A secondary step or a backup method of euthanasia should be used immediately if the pig shows any of the vital signs used to confirm death (National Pork Board, 2016).

### Original method of euthanasia

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The original method can be repeated if it is safe to do so. Caution should be taken because the animal may be thrashing from the first euthanasia attempt.

### Exsanguination

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- This method is also known as bleeding out and is the severance of the major blood vessels in the neck or chest that results in a rapid fall in blood pressure which leads to a lack of blood to the brain and death.
- Carotid arteries and the brachial plexus are acceptable locations for exsanguination.
- The cut must completely sever the vessels (indicated by strong and rapid blood flow), and be large



enough so blood flow is not impeded.

- The length of the knife blade should be at least 5 inches for a grow/finish pig, but may vary depending on the pig size. A scalpel blade can be used for pigs.
- Exsanguination should begin within 15 seconds after stunning to ensure rapid euthanasia. Some euthanasia methods will result in involuntary movement of the pig after it is applied.

(National Pork Board, 2016)

## Pithing

- Pithing is the physical destruction of the brain and upper regions of the spinal cord by a rod or cane.
- The caretaker will insert a wire or polypropylene rod through the hole in the skull made by gunshot or PCB. Once this is complete, push the rod into the brain and slide back and forth and rotate to cause maximum damage to the brain and upper spinal cord.
- The pig may show muscle contraction and twitching, but muscles will relax and movement will be inhibited shortly thereafter.

(National Pork Board, 2016)

## Confirming Insensibility and Death

Regardless of the method used, caretakers must be able to recognize ineffective stunning if it occurs. In addition, death of the pig must be confirmed (National Pork Board, 2016).

### Confirming insensibility

**Caretakers should check insensibility within 30 seconds after the euthanasia method is performed. Insensibility should be monitored and maintained until death.**

- Signs of ineffective stunning in euthanasia are:
  - » Rhythmic breathing
  - » Constrictive pupils
  - » Attempts to regain mobility
  - » Vocalization
  - » Pig has corneal reflex (eye blinks when an object touches the cornea) (See Figure 2.)
  - » Response to a painful stimulus

(National Pork Board, 2016)



*Figure 2. Checking corneal reflex as a check of insensibility.*



## Confirming death

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(The pig should be confirmed dead before moving it for disposal.)

- The caretaker should check the multiple vital signs listed below within 3 minutes after the euthanasia method has been performed.
  - » No breathing
  - » No heartbeat
  - » No movement or muscle tone
  - » No response to painful stimulus
  - » No vocalization
  - » No corneal reflex (the eye blinks when an object touches the cornea) (See Figure 2)

(National Pork Board, 2016)

## Safety

**It is our goal to provide a work environment that is safe and consistent with our other ethical principles. Safety is the responsibility of everyone involved with the farm. Care must be taken to reduce accidents and injuries while working.**

- All caretakers will comply with farm safety protocols at all times.
- Refusing to comply with safety protocols or refusing to use the personal protective equipment (PPE) provided may result in disciplinary actions.
- All caretakers should be trained in the methods of euthanasia and the safety features of each method. Training should be repeated on an annual basis.
- Equipment used should be properly stored and maintained so that it functions correctly when used.
- Carbon dioxide (CO<sub>2</sub>)
  - » Do not handle the CO<sub>2</sub> tank without reading the protocol first.
  - » Install the gas chamber, tubing, CO<sub>2</sub> tanks, and regulator valve as approved by the farm.
  - » All CO<sub>2</sub> tanks on site must be stored in an upright position and double chained to the wall or in the CO<sub>2</sub> cart.
  - » Always move a CO<sub>2</sub> tank on site with a cart and the safety cap on. Never transport a CO<sub>2</sub> tank in a vehicle unless it is in the upright position, and has a safety cap fitted and strapped in.
  - » Depending on the size of the CO<sub>2</sub> tank, injury could occur if the tank falls over. To avoid injury, caretakers should not catch a falling tank.
  - » Ensure the area where euthanasia is to be performed is well ventilated.
  - » Always check all equipment before turning on the CO<sub>2</sub> gas.
  - » Always ensure the lid is secure after the pigs have been placed in the chamber.
  - » Never release CO<sub>2</sub> gas until all the above points have been completed.
  - » Never leave the euthanasia area while CO<sub>2</sub> is being released into the gas chamber.



- Nonpenetrating captive bolt (NPCB)
  - » When restraining the pig, place hands behind the head of the pig, in front of the shoulder. Take care not to trigger the gun directly into the hand of the caretaker; this will cause injury and harm.

## Useful Information

- Caretakers should be surveyed on their comfort level with euthanasia. Those that are not comfortable performing these tasks should not be required to do so. Requiring a caretaker who is uncomfortable to perform this task can lead to compromising the well-being of the animal.
- Conduct regular observation of euthanasia practices to assure that the shortest amount of time is involved to euthanize animals in a humane manner

**Related documents:** “Euthanasia Action Plan” and “Mortality Record Sheet”

### References

National Pork Board. (2015). *PQA Plus site assessment guide 3.0*, p. 31. Des Moines, IA: Author. Retrieved from <https://d3fns0a45gcg1a.cloudfront.net/sites/all/files/documents/PQAPlus/V3.0/BinderMaterial/Tab%206/2%20PQASiteAssessmentGuide.pdf>

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