

COMPARISON OF DIFFERENT PIG EUTHANASIA METHODS AVAILABLE TO THE FARMERS

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Introduction

Pig farmers are interested to learn euthanasia methods that are authorised in France and Europe and which they could adapt to their farms. The ITP has conducted a study aimed at evaluating the various methods legally authorised under European regulations (Directive 93/119/EC on the protection of animals at the time of slaughter or killing) for four categories of animal: sucking piglets, piglets from 8 to 25 kg, grower pigs, and sows.

Material and Methods

The possible euthanasia techniques that we have assessed include:

- electrical stunning (electrodes applied to the head for 5 seconds) followed by electrocution (electrodes applied to the heart for 15 seconds) for pigs over 25 kg (piglets from 8 to 25 kg, grower pigs, sows)
 - prolonged exposure to 80% CO₂ gas for piglets below 8 kg
 - captive or penetrating bolt pistol, either with or without sticking, for all 4 categories of pig
 - trauma to the head (using a 0.5 kg to 1.5 kg hammer) for piglets below 25 kg and 8 kg.
- Ten to 15 animals from each category were euthanized.

The target parameters for assessing the efficiency of the methods studied break down into pain assessment methods (vocalisation) and methods for evaluating state of anaesthesia and death (instantaneous and permanent collapse of the animal, immediate and permanent mydriasis, convulsion, limb reflex responses and lack of movement, measurement of heart beat and cardiac arrest, corneal reflex, urination and defecation, and gaps or spasm). The observations were carried out every 30 seconds from the beginning of euthanasia to cardiac arrest.

Results – Discussion

1) Euthanasia of piglets under 8 kg

Carbon dioxide

This method proved particularly efficient, as all piglets presented cardiac arrest in under 6 minutes, and without having to resort to exsanguination. However, loss of consciousness was not immediate (no instant collapse and immediate mydriasis), and 4 out of 5 pigs vocalised within the first 30 seconds of exposure to the gas.

The CO₂ inhalation phase appears to cause pigs distress and pain. Piglets became motionless in less than 1 min 30 s.

Blunt trauma to the head with a 0.5 kg instrument

After the blow, loss of consciousness is immediate (mydriasis, collapse, no vocalisation), and the piglet shows no signs of pain. When this method is properly performed, the animal becomes motionless in less than 1

minute 30 s, with onset of cardiac arrest occurring in less than 10 minutes. The blow causes more or less heavy local haemorrhaging (nose, mouth, ears). This unaesthetic method is quick and effective.

2) Euthanasia of piglets from 8 to 25 kg

Captive bolt pistol without sticking

This is a painless technique causing immediate loss of consciousness. Animals become motionless between 30 seconds and 1 min 30 s depending on the animal. Local haemorrhaging (nose, mouth, ears) is routinely observed. Cardiac arrest is reached in less than 6 minutes. Relatively violent spasms and paddling episodes are evidence of a complete loss of function of the central nervous system. This very efficient method causes convulsion episodes that are liable to distress an outside public.

Blunt trauma to the head with a 1.5 kg instrument

This is an efficient and painless technique. Time to immobility varies between 1 min 30 s and 4 minutes. Cardiac arrest occurs after 7 to 9 minutes, i.e. a slightly longer period than with the captive bolt pistol. The difference between these two methods can be explained by blood flow at the wound not being systematic with the knocking procedure.

3) Euthanasia of growing pigs

Euthanasia by electrocution without sticking

This is a very efficient method that is painless for the animal. Electrodes applied to the head (eye-to-eye, eye-to-ear, ear-to-ear) for a minimum of 5 seconds cause instantaneous loss of consciousness (collapse, immediate mydriasis, no vocalisation). Electrocution by applying the electrodes to the heart (min. 15 seconds) results in cardiac arrest within one minute, with the animal being immobilised in less than 30 seconds.

Euthanasia by captive bolt pistol with or without sticking

This method is painless for the animal, loss of consciousness is immediate and regaining consciousness impossible, regardless of whether knife sticking is performed. Frequent unconscious and relatively violent movements can be observed during the first 2 minutes 30 s, together with convulsions over a maximum period of 4 minutes 30 s. Sticking shortens the interval to cardiac arrest (1 minute 30 s to 2 minutes with sticking compared to between 4 and 7 minutes without sticking).

In contrast to animals less than 25 kg, there is heavier bleeding through the nose or mouth at the point of impact. Sticking reduces episodes of convulsion and unconscious spasms, and shortens the time to cardiac arrest.

4) Euthanasia of sows

Electrical euthanasia without sticking

As with growing pigs, when properly performed this method is highly effective and painless for the animal. Cardiac arrest was, on average, obtained within 1 minute 30 s.

Euthanasia by captive bolt pistol with or without sticking

This is an efficient technique that sufficiently punctures and injures the brain, provided that a very high-power cartridge is used. If sticking is not performed, then - as is the case with growing pigs - potentially violent spasms and more prolonged convulsion occur, with onset of cardiac arrest after 5 to 7 minutes (compared to 2 to 8 minutes with sticking). The quality of the sticking, if used, is an important factor: bleeding should be heavy and free-flowing. The recommended technique is to bleed the heart using a dagger, as this leads to a much faster onset of cardiac arrest without blood flow into the surrounding environment.

Conclusion

This study has demonstrated that, given the efficacy, feasibility and cost of the various methods tested, the recommended method for piglets over 8 kg, growing pigs and breeding animals is now the captive bolt pistol. This technique is painless for the animal and causes immediate loss of consciousness together with irreversible brain injury and death, irrespective of whether sticking is performed. This method frequently causes relatively violent convulsion reflex and spasms, although none of this should be attributed to any conscious agony or pain whatsoever for the animal. Sticking reduces the

convulsion reflex response and quickens the onset of cardiac arrest. Sticking is performed either by cutting the animal's throat, or better still, by a dagger blow to the heart triggering internal haemorrhaging, which does not pollute the surrounding environment.

The most effective techniques for suckling piglets (less than 8 kg) are the cranial blunt trauma methods. This unaesthetic method is quick and effective.

Electrical euthanasia provides a highly effective method for animals over 25 kg. Unfortunately, the high cost of approved electrical equipment means that this technique remains an unrealistic option for implementation in farms at the present time.

Euthanasia by exposure to CO₂ gas is a fast and effective method, but is not without pain for the animal in the first 20 to 30 seconds following inhalation. The costs involved and its limited applicability in farms (the method can only be applied to piglets) mean that it is difficult to implement this technique in farm structures.

Setting up guidelines for good practice in on-farm animal euthanasia would represent a positive step towards helping farmers design appropriate euthanasia action plans and the welfare of serious sick and injured pigs.

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