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Export Meat

Operational Reference:

1.1a Animal welfare explanatory notes on stunning and sticking at red meat and pork abattoirs



Purpose

These explanatory notes are provided to on-plant personnel involved in performing humane slaughter of livestock (establishment personnel), monitoring for signs of effective stunning and sticking (establishment and departmental personnel) and verifying humane slaughter procedures (establishment and departmental personnel).

This document aligns with animal welfare outcomes presented in the [*Australian standard for the hygienic production and transportation of meat and meat products for human consumption \(Australian Meat Standard – AS4696\)*](#) which requires the minimisation of the risk of injury, pain and suffering and the least practical disturbance to animals.

Note: These explanatory notes are to be taken as an interpretation of published guidance material rather than as mandatory requirements. The information in this document was current at the time of publication. Despite efforts to maintain currency of material presented, the department declares that this document may become outdated as new information is made available. This reference document supersedes the former AQIS Meat Notice 99/17 - Animal welfare explanatory notes.

Scope

This reference document summarises the accepted restraining, stunning and sticking practices for cattle (including calves), buffalo, sheep (including lambs), goats and pigs processed at export-registered abattoirs. For additional market access requirements relating to slaughter, please refer to the [Manual of Importing Country Requirements \(Micor\)](#) and the [Australian Government Authorised Halal Program](#).

This document does not address:

- special provisions for slaughter of unweaned, stressed, injured or diseased animals
- restraint of animals before stunning
- animal handling
- emergency or conditional slaughter of animals
- stunning and slaughter of farmed deer, horses, ratites, poultry or camelids
- occupational health and safety considerations.

Legislation

Under the [Export Control \(Meat and Meat Products\) Rules 2021 \(the Rules\)](#), export-registered abattoirs are legally required to document how they meet animal welfare requirements including stunning and sticking procedures. In accordance with the Rules, they must also meet the animal welfare outcomes of the [Australian Meat Standard](#).

To assist abattoirs in meeting these obligations, the Australian Meat Industry Council (AMIC) developed a set of Animal Welfare Standards:

- [Industry Animal Welfare Standards for Livestock Processing Establishments Preparing Meat for Human Consumption](#)
- [Industry Animal Welfare Standards for Livestock Processing Establishments Preparing Meat for Human Consumption – Implementation guide](#). This guide was designed to assist with implementation of the industry standards and contains performance indicators, checklist questions and targets.

In all states and territories, except in New South Wales, the Industry Animal Welfare Standards are voluntary. However, where an abattoir applies these Standards through the approved arrangement, they must comply.

Other key legislative and reference documents include:

- The [Model Code of Practice of the Welfare of Animals: Livestock at Slaughtering Establishments](#). This document encourages the efficient, considerate treatment of animals so that stress is minimised. It includes a section about emergency slaughter of sick, crippled and downer animals as well as techniques for humane destruction of animals.
- State and territory legislation: [State and Territory Government Animal Welfare Links and Legislation - DAFF](#).
- Licencing conditions of the states and territories that define animal welfare requirements ensure that all stakeholders involved in the care, management, and use of animals adhere to strict standards.

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Principles of animal welfare at the point of slaughter

An animal welfare incident identified during slaughter at an export-registered abattoir (including ineffective stunning or delayed sticking) must be reported as an animal welfare incident. See [Export Meat Operational Guideline: 1.2 Animal welfare incident reporting](#) for information on animal welfare incident reporting.

What is humane slaughter?

In an abattoir, humane slaughter normally involves:

- restraint to enable the accurate placement and use of the stunning device
- stunning to cause instant loss of consciousness; and
- exsanguination (primary bleeding) resulting in loss of blood supply to the brain and irreversible brain death.

For the purposes of slaughter, there are currently three methods for stunning including:

- mechanical (non-penetrating percussive, penetrating, and free bullet) stunning
- electrical stunning
- controlled atmosphere stunning using carbon dioxide (CO₂).

The use of free bullet stunning can be used in emergency slaughter situations and is principally referenced as a killing method with no defined stun-stick interval ([State and Territory Government Animal Welfare Links and Legislation - DAFF](#)).

Stunning methods

The following section provides reference information on the various types of stunning methods and their mode of action. For guidance on recommended parameters for effective stunning (or killing) in Australia, see the [Industry Animal Welfare Standard for Livestock Processing Establishments Preparing Meat for Human Consumption – Implementation guide](#): Appendix 02.

Mechanical stunning

Non-penetrating percussive stunning (reversible stunning)

Non-penetrating percussive stunning is often referred to as “mushroom-head” stunning as the stunning device is characterised by a blunt, mushroom shaped bolt that impacts the skull, causing insensibility through concussive force rather than by penetrating the brain.

When used in accordance with manufacturer’s specifications and placed correctly, the physical blow applied to the head causes unconsciousness through rapid acceleration and deceleration of the brain within the cranial cavity. This creates a significant increase in intracranial pressure followed by an immediate drop resulting in a marked increase in stimulation and firing of neurons and widespread damage to nervous tissue and blood vessels. The resulting damage causes brain dysfunction and immediate loss of consciousness. In these circumstances and when applied correctly, it is considered a reversible stunning method.

Penetrating captive-bolt stunning (irreversible stunning)

The “captive bolt” is a steel bolt within a guiding cylinder. The bolt penetrates the skull on detonation of a designated, single use cartridge. Like a non-penetrating percussive stunning device, the force of the captive bolt causes the brain to impact the inside of the skull resulting in brain dysfunction and immediate loss of consciousness. The captive bolt also results in structural damage to the brain and, when applied correctly, results in irreversible stunning or death.

Free bullet (irreversible stunning)

A single shot free bullet (pistol or rifle) may be used as an irreversible stunning or killing method. On occasion, this method is used for emergency slaughter by experienced abattoir operators. It is important that the correct ammunition is used for each required situation.

Electrical stunning

Electricity parameters

The flow of electricity through an object is called the current. The current is measured in amps (A). The current is determined by voltage (the pressure that 'pushes' electricity between two locations) and the resistance of an object. The current is directly proportional to the voltage and inversely proportional to the resistance of an object.

Current = voltage/resistance

There are two potential sources of resistance in electrical stunning:

- 1) level of skin contact with the electrodes, and
- 2) the body tissues.

Variable current

A variable electric current refers to an electric current that changes in direction and/or magnitude over a time period. This can occur as:

- 1) alternating current (AC) where the flow of electric charge periodically reverses direction, or
- 2) variable direct current (DC), where the direction remains constant, but the magnitude can be modulated.

Fixed current

In contrast, a fixed current maintains a consistent magnitude and direction over time.

Frequency of the current

The frequency of the current has become the focus of recent research due to different effects on meat quality and will influence the minimum required current for an effective stun.

Head only electrical stunning (reversible stunning)

This is the most commonly used electrical stunning method in sheep, goats, bobby calves and cattle. A variable (alternating) current passes across the brain causing an epileptic seizure and immediate loss of consciousness before any pain is registered by the animal. Correctly applied, the result is a reversible stun. The effectiveness relies on sufficient current being applied for an appropriate length of time (refer to sections below for guidance on length of time relevant for species and length of insensibility). Correct electrode placement is vital to ensure adequate current passes through the animal's brain. If the electrodes are placed too far back (caudal, for example, on the neck), the current passes through the spinal cord resulting in paralysis but not unconsciousness or insensibility.

Head to leg, head to back and head to body electrical stunning (non-reversible stunning)

'Head to leg', 'head to back' and 'head to body' electrical stunning are methods where additional electrodes are applied to leg, back, chest (pig) or brisket (cattle) respectively to provide supplemental current resulting in an effective stun and cardiac arrest. Depending on the frequency, these are all irreversible stunning methods.

Controlled atmosphere stunning (CAS) using carbon dioxide

Carbon dioxide (CO₂) gas is the method most commonly used to stun pigs for slaughter in Australia. In CO₂ gas stunning systems pigs enter a gondola and are lowered into high concentrations of CO₂ gas. For an effective stun, CO₂ concentration should be 90% by volume, but not less than 80% by volume. An audible and visual alarm system for <80% by volume CO₂ concentration should be in place.

Correct placement of stunning equipment

For an effective stun, the equipment must be used as per the manufacturer's recommendations.

To ensure an effective stun, variables must be managed including:

- equipment placement
- equipment maintenance
- the status of the animal being stunned. For example, species, age and demeanour are important factors that must be considered when placing electrodes for stunning animals. Each of these

factors influences how the stunning process is carried out to ensure it is both effective and humane

- competency of the operator.

Non-penetrating percussive stunning

For cattle, it is recommended that the percussive stunner be positioned on the forehead above an intersection of lines creating an “X” between the eyes and the base of the horns. For species other than cattle refer to the [Humane Slaughter Association Online Guide – Captive-Bolt Stunning of Livestock](#) and [Meat Institute Animal Handling Guidelines and Audit Guide](#).

Penetrating (captive bolt) stunning and firearms

Descriptions and pictorial reference points for correct placement of the captive bolt pistol (including firearms) are provided in [The Model Code of Practice for the Welfare of Animals: Livestock at slaughtering establishments](#) - Appendix II.

Pigs: There are key differences between adult and younger pigs. Adult pigs have a thicker skull, and denser cranial bones compared to younger pigs. The brain is also positioned slightly lower and more towards the back of the head. This impacts the effectiveness of both firearms and captive bolts, requiring more precise application and often higher calibre or cartridge ‘strength’ respectively to ensure a quick, humane death.

Electrical stunning equipment

Electrical stunning equipment should have an activation light incorporated into the unit that is easily observed by the operator. The light should be linked to a timing mechanism which ensures the correct current is applied to the animal for the appropriate length of time. Therefore, the light will turn on and remain on from the application of the stun until the correct current has been applied for the correct duration of time. At this time, the light will turn off. Where electrical stunning is used, recording devices/gauges must be in clear view of the operator. Abattoirs must be aware of additional importing country requirements for the use of electrical stunning equipment (for example, one requirement of the EU is an audible alarm in addition to the light). See [Micor](#) for more information on importing country requirements.

Electrical (head only) stunning

The electrodes should be placed in a way that the electric current passes through the animal’s brain. Electrodes may be placed on, and span, the brain (skull) just behind the ears and in front of the first cervical vertebra. Incorrect placement is on cervical vertebra 1, 2, or 3. Placement here causes immobilisation (not unconsciousness). Other delivery systems for cattle may have electrodes in a neck stanchion and nose plate, with or without a nose lift, where the current will pass from the neck stanchion to the nose plate. Handsets and stun delivery hardware will vary depending on the type of knocking box setup and the manufacturer of the equipment. This method of electrical stunning is considered reversible.

Electrical (head-to-body) stunning

A pair of electrodes must be placed on the part of the skull spanning the brain, and the third electrode placed on the chest (pigs) or brisket (cattle). Poor placement of the head electrodes can result in an ineffective stun and the animal being sensible to the perception of a potentially painful stimulus such as cardiac arrest (fibrillation). This method of electrical stunning is not considered reversible.

Electrical (head-to-leg or head-to-back) stunning

Current is passed through the animal’s body from a head electrode to a back or leg electrode (front or back leg). The electrical current crosses the heart in each of these pathways, inducing unconsciousness and cardiac arrest. These methods of electrical stunning are not considered reversible.

Potential issues with the different types of stunning methods

Non-penetrating percussive stunning and penetrating (captive bolt) stunning

- poor maintenance of equipment
- inexperienced operator

- incorrect charge or bolt dimensions for the head/bone structure of animal
- poor placement.

Electrical (head only) stunning and head-to-body stunning

- poor maintenance of equipment
- inexperienced operator
- incorrect electrical settings
- incorrect placement of the electrodes
- poor contact
- electrical arcing
- high contrast resistance (caused by wool or dirt on the animal surface, dirty or corroded electrode, low voltage/current or high electrical frequency).

Controlled atmosphere stunning using carbon dioxide

- incorrect concentration of CO₂
- too short gas (CO₂) exposure time
- low gas temperature and humidity
- over loading of the gondola (too many pigs in the gondola)
- optimal animal welfare is achieved by loading pigs in groups.

Assessment of insensibility

The effectiveness of the stun must be assessed prior to sticking. For the different stunning methods available, there are different ways of confirming unconsciousness/insensibility that operators need to be aware of. The [Australian Meat Standard](#) requires that animals are stunned in a way that ensures animals are unconscious and insensible to pain before sticking occurs and do not regain consciousness or sensibility before dying.

It is important that any animal showing signs of recovering consciousness (even if still unconscious) are humanely killed using a back-up method.

The effectiveness of the stun must be assessed differently depending on the stunning method used. For guidance on the assessment of effective stunning and killing, see the [Industry Animal Welfare Standard for Livestock Processing Establishments Preparing Meat for Human Consumption – Implementation Guide](#): Appendix 03.

Sticking

Sticking is defined as the commencement of primary bleeding and includes the throat cut and/or thoracic stick depending on species. Following stunning, sticking occurs (see: [Figure 1](#)). It hastens the onset of irreversible insensibility and ensures death. The throat cut results in the bilateral severance of carotid arteries and may require a specific religious technique be applied in accordance with importing country requirements (religious throat cut; see [Micor](#) for trading partner requirements). However, the potential for the occlusion of the cut peripheral arteries (e.g. the carotids) by clotting or constriction, and presence of vertebral arteries in cattle and calves, must also be considered in the absence of performing a thoracic stick.

Thoracic sticking

Thoracic sticking is where a knife is used to sever all major blood vessels close to the heart (the brachiocephalic trunk) to induce effective bleeding. The thoracic stick is the preferred method following a throat cut or religious throat cut (particularly in bovines and bubalines) because of the presence of vertebral arteries and the potential for the occlusion of the cut peripheral arteries (e.g. the carotids) by clotting or constriction of the cut end. Occlusions can occur because of:

- Stress response – release of adrenaline and noradrenaline
- Vascular damage due to physical trauma from severing of vessels
- Blood clotting cascade with thrombin formation leading to clot formation.

Occlusion caused by any of the above occurrences could potentially delay bleeding and the onset of insensibility.

Thoracic sticking is undertaken in bovine and bubaline animals to hasten onset of death and prevent return of sensibility following reversible stunning, it is not a mandated requirement in sheep, lambs or goats.

[The Model Code of Practice for the Welfare of Animals: Livestock at slaughtering establishments](#) states that the expected time for return to sensibility following reversible stunning is 45 seconds. Therefore, if these major vessels are not severed within this time the animal may regain sensibility. Thoracic sticking is the primary bleeding method for pigs.

Thoracic sticking in calves and adult cattle which have been electrically stunned

Calves have the potential for prolonged brain activity after the severing of carotid arteries due to the presence of intact (non-severed) vertebral arteries that are protected within the vertebral bones. After a throat cut, vertebral arteries can provide continued blood flow to the brain for an extended period and bleed out time ([Figure 1](#)) can reach 200 seconds if thoracic sticking is not performed. Therefore, calves which undergo only a throat cut following electrical stunning may recover from the stun before permanent insensibility has occurred. To overcome this anatomical difference, calves require mandatory thoracic sticking which ensures severance of the brachiocephalic trunk ([The Australian Animal Welfare Standards and Guidelines for Land Transport of Livestock](#) and [The Australian Animal Welfare Standards and Guidelines for Cattle](#)).

Scientific research is inconclusive on the relative importance of the vertebral arteries with regards to the significance of their role in supply of blood to the brain as calves grow older, but it is accepted that, to ensure humane outcomes, thoracic sticking is used to achieve rapid initial blood loss and the shortest time to loss of brain function ([Humane Slaughter Association Online Guide – Electrical Stunning of Red Meat Animals](#)). The [World Organisation for Animal Health \(WOAH\) Terrestrial Animal Health Code](#) recommends bleeding with a cut of the brachiocephalic trunk for all bovines, due to the risk of prolonged bleed out times and regaining consciousness following a neck cut alone. As well as the vertebral arteries continuing to provide blood to the brain, any occlusion of the cut major arteries will slow exsanguination. Therefore, bleeding with a cut of the brachiocephalic trunk is preferred in bovines. The [Industry Animal Welfare Standards for Livestock Processing Establishments Preparing Meat for Human Consumption](#) mandates the thoracic sticking of cattle.

For bobby calves, the thoracic stick must be applied immediately after the initial stick (throat cut) and no more than 20 seconds after the stun. For calves that fall into the category of either light vealer or vealer, thoracic sticking is also required but the timeframe is not prescribed, however, the animal must never regain consciousness once stunned (see [stun-stick interval section](#)). Dressing procedures must not be performed before the animal is confirmed as dead.

Note: Dressing procedures do not include oesophageal occlusion and electronic identification device removal or scanning, which may be performed when the animal has been confirmed as unconscious.

Stun-stick interval

The period between stunning and sticking (the stun-stick interval) is an essential component of stun-stick management and must be monitored to ensure humane slaughter of animals. The [Australian Meat Standard](#) states the following requirements for humane slaughter.

When a reversible stunning method is used, sticking must:

- be applied promptly
- be applied in a way that ensures death.

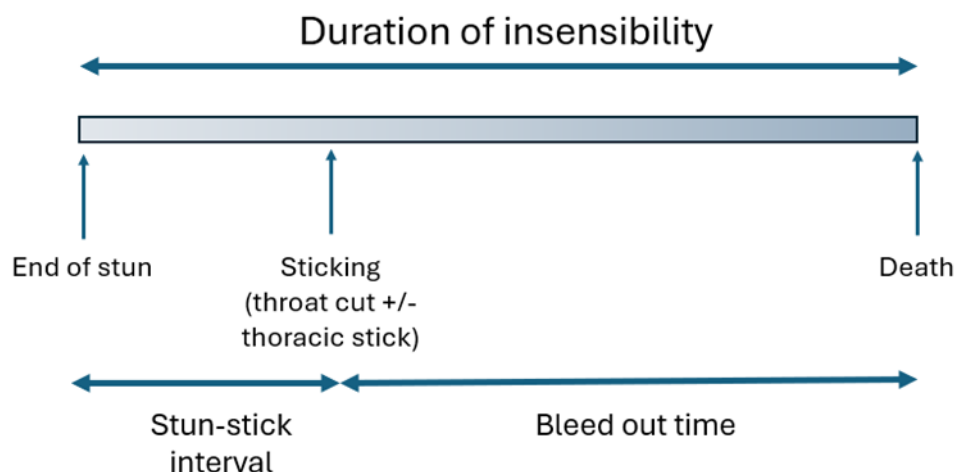


Figure 1: Figure to illustrate the duration of insensibility, the stun-stick interval and the bleed out time in a reversible stunning procedure.

Note: a stun-stick interval is not required for irreversible stunning because these methods produce irreversible insensibility in 100% of animals.

For guidance on stun-stick intervals, the [Industry Animal Welfare Standards for Livestock Processing Establishments Preparing Meat for Human Consumption - Implementation guide](#) compiles the targets and good management practice for the stun-stick interval for reversible stunning techniques from a number of plenary reference materials. The stun-stick interval requirements in the industry standard are consistent with the recommendations of the [WOAH Terrestrial Animal Health Code](#) (Chapter 7.5; Animal Welfare During Slaughter).

Other points for consideration

Restraint

Restraint is critical for those stunning methods that rely upon appropriate placement to ensure effectiveness, for example, electrical and mechanical. A restraint device must either fully support an animal or have non-slip footing so the animal can stand without slipping. Restraint devices should hold fully sensible animals in a comfortable, upright position.

Electro-immobilisation

Electro-immobilisation after reversible stunning and prior to sticking is not acceptable. The practice allows for the perpetuation of poor stunning practices by masking deficiencies in effective stunning technique.

Free bullet firearms

Free bullet firearms are usually reserved for emergency slaughter or humane destruction of animals in the lairage or on transport vehicles. When using free bullets, the [WOAH Terrestrial Animal Health Code](#) advises that to minimise animal welfare issues, the operator must be competent, have an accurate target available and use ballistics appropriate for the situation. The aim is to ensure death. The use of a firearm can be considered a stunning method where the equipment is applied in the correct position with an appropriate gauge used in accordance with local laws.

Oesophageal occlusion

Oesophageal occlusion is an acceptable procedure to perform after insensibility following confirmation of an effective stun. An occlusion device may be applied directly through the oral cavity down the length of the oesophagus, or an external clip (weasand clip) may be applied securely around the oesophagus in conjunction with a rodding procedure. The rodding procedure involves the operator creating an incision in the neck to assist the operator to identify and free the oesophagus from its soft tissue connections to the trachea using a rod. The rodding device also assists to move the weasand clip to the distal oesophagus, preventing spillage of ingesta. Incisions in the neck as preparatory procedures for rodding alone are not permitted as they substantially increase the time between stunning and sticking.

Management of foetuses during slaughter of pregnant animals

In relation to the welfare of foetuses, the [WOAH Terrestrial Animal Health Code](#) makes the following recommendations:

- The foetus should be left undisturbed in utero for at least 30 minutes after the death of the dam. The uterus could be removed as a whole, clamped and kept intact such that there is no possibility for the foetus to breathe.
- When uterine, placental or foetal tissues, including foetal blood, are not to be collected as part of the post sticking procedure of pregnant animals, all foetuses should be left inside the unopened uterus until they are dead.
- Where there is doubt as to foetal consciousness, the foetus should be euthanised with an appropriate device or method.

Where **bovine** foetal blood or serum is being collected, additional guidelines state that blood should not be collected for at least 20 minutes after dam death ([Animal Welfare Guidelines - Handling of Animals at Tasmanian Livestock Processing Premises](#), [RSPCA – What is fetal bovine serum and should it be used?](#)).

Related material

The following related material is available on the internet:

- Webpage: [Approved arrangement guidelines – Halal Certification Operations for Red Meat](#)
- Webpage: [Animal Welfare Guidelines - Handling of Animals at Tasmanian Livestock Processing Premises](#)
- Webpage: [Export Control Act 2020](#)
- Webpage: [Export Control \(Meat and Meat Products\) Rules 2021](#)
- Webpage: [Export Meat Operational Policy 1.0 Animal welfare](#)
- Webpage: [Export Meat Operational Guideline 1.1 Animal welfare – from arrival to completion of slaughter](#)
- Webpage: [Export Meat Operational Guideline: 1.2 Animal welfare incident reporting](#)
- Webpage: [Humane Slaughter Association Online Guide – Captive-Bolt Stunning of Livestock](#)
- Webpage: [Humane Slaughter Association Online Guide – Electrical Stunning of Red Meat Animals](#)
- Webpage: [Industry Animal Welfare Standard for Livestock Processing Establishments Preparing Meat for Human Consumption](#)
- Webpage: [Industry Animal Welfare Standard for Livestock Processing Establishments Preparing Meat for Human Consumption – Implementation guide](#)
- Webpage: [Manual of Importing Country Requirements \(Micor\)](#)
- Webpage: [Meat Institute Animal Handling Guidelines & Audit Guide](#)
- Webpage: [Model Code of Practice for the Welfare of Animals: Livestock at slaughtering establishments](#)
- Webpage: [RSPCA – What does the term humane killing or humane slaughter mean?](#)
- Webpage: [RSPCA – What is fetal bovine serum and should it be used?](#)
- Webpage: [State and Territory Government Animal Welfare Links and Legislation - DAFF](#)
- Webpage: [The Australian Animal Welfare Standards and Guidelines for Cattle](#)
- Webpage: [The Australian Animal Welfare Standards and Guidelines for Land Transport of Livestock](#)
- Webpage: [World Organisation for Animal Health \(WOAH\) Terrestrial Animal Health Code](#)
- *Australian standard for the hygienic production and transportation of meat and meat products for human consumption* (Australian Meat Standard – AS4696) is available for purchase through [Intertek Inform](#) or [Standards Australia Store](#)
- Grandin, Temple & Australian Bureau of Animal Health. 1983, *Livestock handling from farm to slaughter* / Temple Grandin. Australian Government Publishing Service Canberra is available at the [National Library of Australia](#).

Attachment 1: Definitions

Approved arrangement

An approved arrangement under Chapter 5 of the Export Control Act 2020.

An arrangement for a kind of export operations in relation to a kind of prescribed goods approved by the Secretary.

An approved arrangement:

- documents the controls and processes to be followed when undertaking export operations in relation to prescribed goods for export
- enables the secretary to have oversight of specific export operations.

Bobby calf

A young bovine or bubaline animal as defined by the Export Control Act and subordinate legislation; in reference to hot standard carcase weight (HSCW).

Controlled atmosphere stunning (CAS)

The exposure to high concentrations of displacement gas intended to induce a hypoxic environment.

Dressing

The progressive separation of the body of an animal into a carcase (or sides of a carcase), offal and inedible material.

Electrical stunning

Application of an electric current across the brain of sufficient magnitude to induce immediate unconsciousness.

Emergency slaughter

Means slaughter by necessity of any animal that has recently suffered traumatic injury or is affected or suspected of being affected by a disease or other abnormality; and is in pain or is likely to deteriorate unless it is killed immediately.

Insensibility

Synonymous with unconsciousness. State of unawareness (loss of consciousness) in which there is temporary or permanent disruption to brain function, during which the animal does not feel pain.

Light veal (light vealer)

A young bovine or bubaline animal as defined by the Export Control Act and subordinate legislation; in reference to hot standard carcase weight (HSCW).

Mechanical stunning

Reversible non-penetrating percussive stunning and irreversible penetrating stunning and free bullet (gunshot) stunning.

Primary bleeding

The initial and major part of bleeding (exsanguination) characterised by a continuous flow of blood.

Religious throat cut

A throat cut performed for religious slaughter e.g. 'Halal cut' in accordance with importing country requirements.

Restraint

The use of manual or mechanical means to limit some or all of an animal's ability to make normal postural adjustments for the purpose of administering of an approved method of stunning.

Rodding

The process of inserting a blunt metal rod through the incision in the neck to sever the connective tissue between the oesophagus and trachea. Rodding can be performed following sticking (immediately after stunning) and before full exsanguination (bleeding out).

Slaughter

The killing of an animal that includes stunning, sticking and bleeding.

Sticking

Severing of major blood vessels to induce effective bleeding. Sticking will be performed with a throat cut and/or thoracic stick.

Stunning (reversible and irreversible)

Rendering an animal unconscious and insensible to pain.

- Irreversible stunning – where there is no possibility of the animal regaining consciousness.
- Reversible stunning – where the animal will regain consciousness unless effectively bled out to cause death.

Stun-stick interval

The time it takes to stick an animal after it has been stunned.

Throat cut

Transverse severing of both carotid arteries.

Thoracic sticking

Severing of all major blood vessels close to the heart (i.e. the brachiocephalic trunk) to induce effective bleeding.

Note: In cattle and buffalo (including calves), where an initial throat cut is used, a thoracic stick shall be performed after cutting the throat to interrupt vertebral artery blood flow.

Veal (Vealer)

A young bovine or bubaline animal as defined by the Export Control Act and subordinate legislation; in reference to hot standard carcase weight (HSCW).