

Technical Note No 17

Stun to Stick Times (Electrical Stunning)

Summary

Head-only electrical stunning is a reversible process, animals will recover if they are not killed immediately after stunning by severing the major arteries supplying the brain. For slaughter to be humane, it is essential that animals are stunned effectively and bled correctly without delay (within 15 seconds) to ensure death is caused by blood loss and that it occurs before the animal regains consciousness.

Bleeding effectively, and within 15 seconds of head-only electrical stunning, is essential to ensure humane slaughter of animals.

Humane Slaughter Association

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Legislation

The legislation covering the welfare of all farmed animals whilst being handled and slaughtered states that:

“Any person engaged in the bleeding or pithing of an animal which has been simple stunned must ensure that the animal is bled or pithed without delay after it has been simple stunned.”

“... any person engaged in the bleeding of an animal that has been simple stunned must ensure that the bleeding is:

- (a) rapid, profuse and complete
- (b) completed before the animal regains consciousness
- (c) carried out by severing the two carotid arteries or the vessels from which they arise

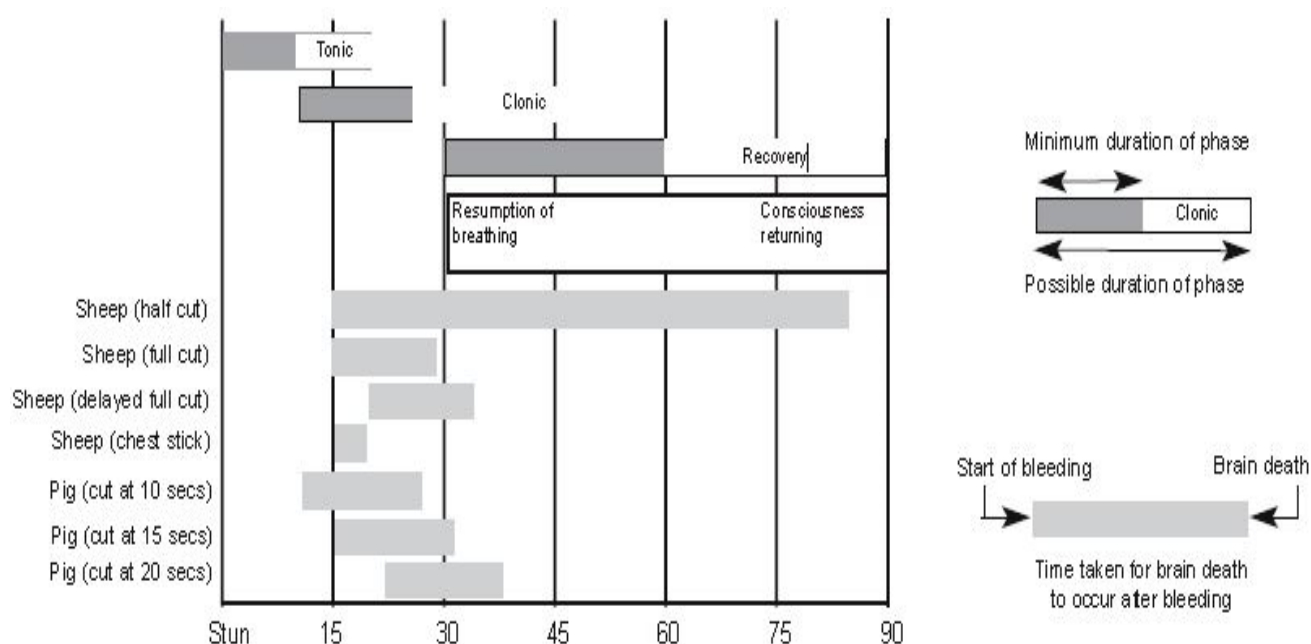
In addition, hygiene legislation introduced in 2006 requires that:

- (a) The trachea and oesophagus must remain intact during bleeding, except in the case of slaughter according to a religious custom.

Physiology

Studies of the bleeding of animals following stunning have shown that it is essential to cut all major blood vessels supplying the brain, rather than just one, to ensure death is caused by rapid blood loss and before consciousness returns.

The following diagram shows the variation in times to loss of brain function, as influenced by the timing, quality and technique of sticking. In sheep, if only one carotid artery and one jugular vein are cut (half-cut), brain death can take up to 70 seconds (over 50 seconds longer than with a full cut). During this time the animal may enter the recovery phase and consciousness will return. In pigs, a significant delay in bleeding will result in the animal possibly entering the recovery stage before brain function is lost.



Expected duration of phases following head-only electrical stunning

Phase	Duration	Visible signs
Tonic	10 to 20 seconds	<ul style="list-style-type: none">• Animal collapses• Body becomes rigid• No rhythmic breathing• Head raised• Hind legs flexed into body
Clonic	15 to 45 seconds	<ul style="list-style-type: none">• Involuntary kicking or paddling• Relaxation
Recovery	30 to 60 seconds	<ul style="list-style-type: none">• Resumption of normal rhythmic breathing• Responds to painful stimuli• Becomes visually aware• Attempts to stand

When electrically stunned, an animal will pass through three stages: tonic, clonic and recovery. In an abattoir situation the third should never be seen.

Correct bleeding

Bleeding involves cutting the carotid arteries and the jugular veins, or the vessels from which they arise. It is important that all blood vessels are cut cleanly to ensure that blood loss is rapid and profuse.

The chest stick is the most efficient method of bleeding for red meat species, as it severs all the major blood vessels close to the heart. This achieves both rapid initial blood loss and the shortest time to loss of brain function.

For pigs, the knife should be inserted in the mid-line of the neck at the depression in front of the breastbone. When penetration has been made, the knife handle should be lowered, so that the blade is pointing towards the tail of the animal, and pushed upwards to sever all the major blood vessels which arise from the heart.

For a rapid bleed out, and to comply with regulations, it is recommended that sheep and goats should be stuck close to the heart in a similar manner to pigs. Alternatively, sticking may be done by making a deep, transverse cut across the throat close to the head, to sever the four major blood vessels in the neck.

However, if the slaughter is not according to a religious custom, this may result in a non-compliance and will also result in a longer bleed out time.

IMPORTANT

After stunning, it is essential that animals are bled without delay (within 15 seconds) so there is no chance of consciousness returning before death occurs.

DISCLAIMER OF LIABILITY

In no circumstances can the HSA accept liability for the way in which the equipment in this leaflet is used: or for any loss, damage, death or injury caused thereby, since this depends on circumstance wholly outside the HSA's control

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Further Reading

Council Regulation (EC) No 1099/2009 (protection at time of killing)
OJ of the EU 2009

The Welfare of Animals at the Time of Killing (England) Regulations
Defra 2015

Regulation (EC) No 853/2004 – H2 (Hygiene legislation)
OJ of EU 2004

Full details of all legislation can be found on www.legislation.gov.uk and <http://eur-lex.europa.eu/legal-content>

Electrical Stunning of Red Meat Animals
HSA 2005