European Food Safety Authority

EFSA's information meeting: identification of welfare indicators for monitoring procedures at slaughterhouses

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Indicators for assessing unconsciousness after stunning

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Indicators for assessing unconsciousness

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Stunning methods induce unique brain states that are incompatible with the persistence of consciousness

These altered brain states are accompanied with certain behavioural patterns and physical reflexes that can be used to monitor efficacy of stunning methods in slaughterhouses

These reflexes are time related events and need to be assessed at specific time post-stun in order to be meaningful indicators of the state of consciousness in animals

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Head-only electrical stunning (red meat species)

Successful head-only electrical stunning should induce a generalised epileptiform activity in the brain leading to immediate collapse (loss of posture) of the animal with flexed hind legs

The epileptic state can be recognised by the immediate onset of tonic seizure, lasting several seconds, followed by clonic seizures

Tonic seizure induced by electrical stunning

Flexed hind legs
Extended fore legs
Fixed eye

Indicators for assessing unconsciousness

Head-only electrical stunning (red meat species)

During tonic seizure, all the muscles are in a state of tetanus (stiffness) and, as a consequence, the animals will show

fully extended and stiff front and hind legs
no respiration (apnoea)
fixed eyes without any reflex (palpebral or corneal)
no response to painful stimulus (e.g. muzzle or nose prick with a needle)

Palpebral and corneal reflexes

Elicitation of palpebral reflex in a pig

Elicitation of corneal reflex in a cattle

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Head-only electrical stunning (red meat species)

Clonic seizures occur as running, kicking or paddling movements of the legs

Spontaneous breathing resumes during clonic seizures

Animals are alert and responsive at the end of the clonic seizures

If the animal is bled out during tonic seizure, the duration of clonic seizures will be shortened, ending in completely relaxed carcass

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Captive bolt stunning (cattle)

Successful captive bolt stunning should induce brain concussion followed by structural damage to deeper parts of the brain

Brain concussion can be recognised by the immediate collapse of the animal with all the four legs flexed during the tonic seizure, lasting for a short time, and then the front legs are fully extended

Captive bolt stunning - cattle

Immediate collapse

Flexed legs and muscle spasms

Indicators for assessing unconsciousness

Captive bolt stunning (cattle)

During tonic seizure, the animals will show

- no respiration (apnoea)
- fixed eyes without any reflex (palpebral or corneal)
- no response to painful stimulus (e.g. muzzle or nose prick with a needle)

Clonic seizures occur as kicking or paddling movements of the hind legs

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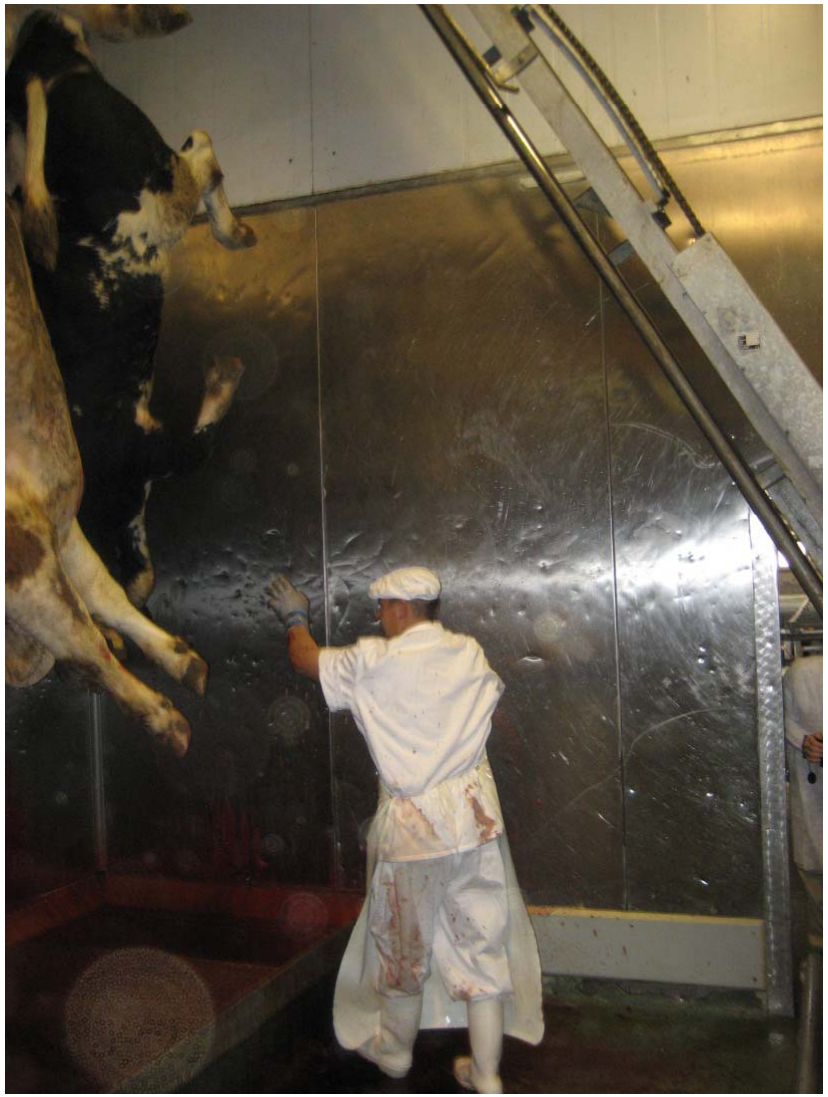
Captive bolt stunning (cattle)

At the end of seizures, muscle tone is lost as evidenced from the lack of tension in lower mandible (jaw), protruding tongue, drooping ears and legs

Chest sticking in effectively stunned cattle leads to rapid onset of death

Absence of seizures, eye ball rotation and / or head righting reflex indicate poor / ineffective stunning

Signs of poor captive bolt stunning



Violent kicking

Lifting of fore legs and head

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Exposure to gas mixtures (pigs)

Exposure to gas mixtures for sufficient duration should lead to inhibition of the brain resulting in complete loss of spontaneous and reflex activities:

- no muscle tone
- no respiration, including gagging
- fixed eyes without any reflex (palpebral or corneal)
- no response to painful stimulus (e.g. muzzle or nose prick with a needle)

If irregular gagging or leg movements are present at the exit from the stunner, they should cease before shackling

Exposure to gas mixtures - pigs

Relaxed carcass after exit and during bleeding

Exposure to gas mixtures - poultry

Relaxed carcass after exit and during bleeding

Indicators for assessing unconsciousness

Electrical water bath stunning (EWBS) for poultry

Successful EWBS stunning should induce a generalised epileptiform activity in the brain

The epileptic state can be recognised by the immediate onset of tonic spasm from the moment of birds entering the WBS and lasting several seconds after the exit from the stunner

Indicators for assessing unconsciousness

Electrical water bath stunning (EWBS) for poultry

During tonic seizure, all the muscles are in a state of tetanus (stiffness) and, as a consequence, birds will show

fully extended stiff legs
wings held tightly around breast
no respiration (apnoea)
fixed eyes without any reflex (palpebral or corneal)
no response to painful stimulus (e.g. pinching or pricking comb with a needle)

WBS - poultry

Tonic seizure – arched neck and wings tucked around breast

Indicators for assessing unconsciousness

Electrical water bath stunning (EWBS) for poultry

Presence of breathing, palpebral or corneal reflex and /or wing flapping at the exit from the stunner or during bleeding indicate ineffective stunning

Induction of cardiac ventricular fibrillation during WBS will result in relaxed carcasses at the exit of the stunner and they will not show any signs of life

THANK YOU

Thank you for your attention!