# EFSA opinions - animal welfare at slaughter

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# Two EC mandates on Slaughter of animals and killing for purposes other than human consumption

**Background on the subject**

- Council Regulation (EC) No 1099/2009
- Previous EFSA Scientific outputs adopted in 2004, 2006, 2012, 2013, 2014, 2015, 2017
- Terrestrial Animal Health Code from **WOAH - revision of**:

**Request to EFSA in 2018:**

To review the scientific literature and **provide a sound scientific basis for future discussions at international level** on the welfare of the animals in the context **of slaughter and other types of killing** (killing for other purposes than slaughter)

# Definition of the scenarios and target populations

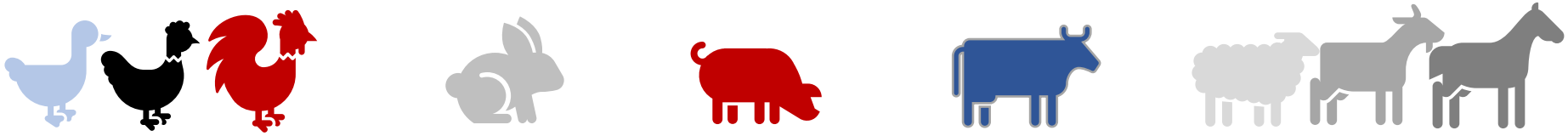
**Slaughter: killing of animals for human consumption** that could take place in a slaughter plant or during on-farm slaughter - from the arrival until the animal is dead, including slaughter without stunning (assessment of AW on the farm and during transport is excluded).

## Killing for other purposes than slaughter:

- large scale killings in case of depopulation for disease control purposes and similar situations (environmental contamination, disaster management, etc.) outside slaughterhouses.
- killing of unproductive animals that might be practiced on-farm for health, welfare or economic reasons (large-scale killing/individual killing).

## Five groups of Animal species

- Domestic birds; rabbits; pigs; cattle (including buffalo and bison); 'other species' (sheep, goats, camelids, deer, horses, ratites)



# Terms of References and Processes considered

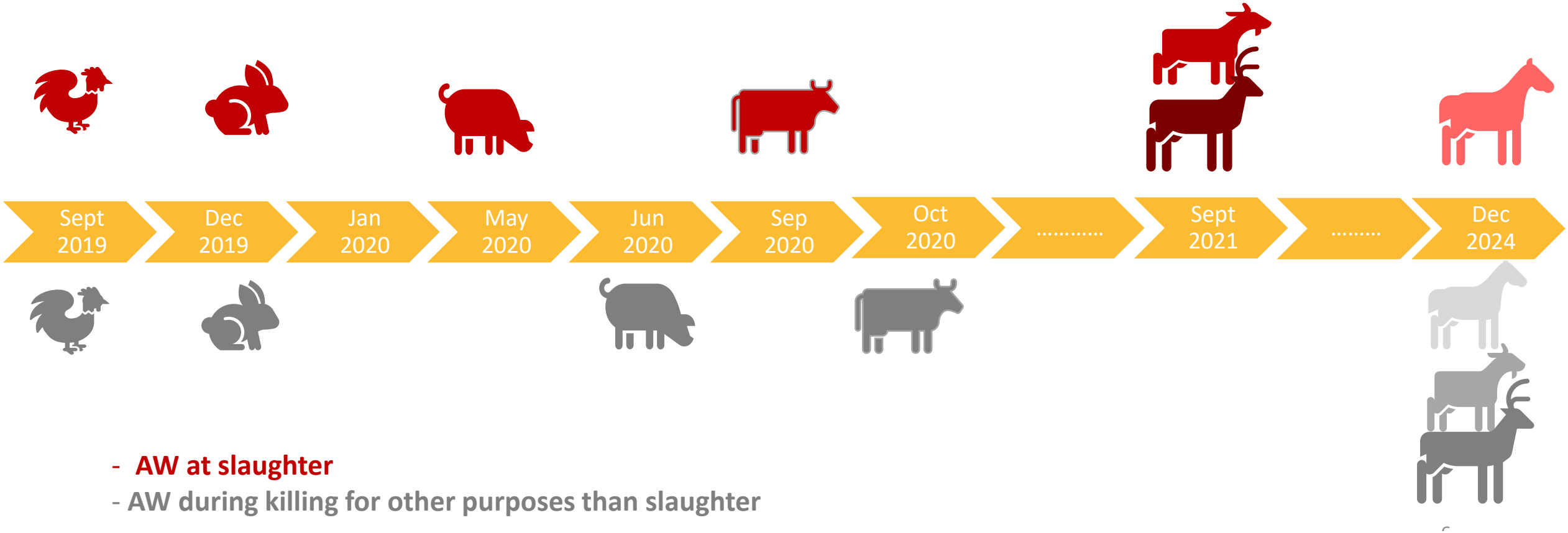
| **Process steps to consider in the two mandates:**<br>Slaughter and **killing for other purposes than slaughter** | **ToRs** |
|---|---|
| 1. Arrival<br>2. Unloading<br>3. Lairage<br>4. **Handling** and moving (free moving animals only)<br>5. **Restraint**<br>6. Stunning **(Stunning/killing)**<br>7. Bleeding<br>8. Slaughter of pregnant animals (free moving animals only)<br>9. Emergency killing (outside the normal slaughter line)<br>10. **Unacceptable methods, procedures or practices on welfare grounds** | ToR-1: Identify welfare hazards and their origins (in terms of facilities, equipment, staff)<br><br>ToR-2: Define ABMs to assess performance on AW<br><br>ToR-3: Provide preventive and corrective measures (structural or managerial) to address the hazards<br><br>ToR-4: Point out specific hazards related to species or types of animals (e.g. young, with horns) |

# Working group

- **WG experts**: Virginie Michel (chair), Antonio Velarde, Mohan Raj
- **WG hearing experts**: Marien Gerritzen
- **EFSA staff**: Denise Candiani

# Timeline

**Timeline of the adoptions by the AHAW Panel: 11 Scientific Opinions**




- **AW at slaughter**
- AW during killing for other purposes than slaughter

# Approach

**Phase 1: pre-slaughter (or pre-killing)**

includes

- Arrival/unloading/handling and moving/lairage (slaughter)
- Handling and moving only (on-farm killing)

**Phase 2: stunning and killing**

**Phase 3: bleeding**

**Welfare consequences implied**

(based on expert opinion but no formal process for selection)

**Hazards**

(based on literature)

**ABMs**

(based on literature)

**Preventive and corrective measures**

(based on literature)

→ **OUTCOME TABLES**

# Approach

**Phase 1: pre-slaughter (or pre-killing)**

includes

- Arrival/unloading/handling and moving/lairage (slaughter)
- Handling and moving only (on-farm killing)

→

**Welfare consequences assessed (no formal process for selection):**

- **Impeded movement (described as movement restricted, injures, broken bones due to poor handling and inadequate facilities)**
- **Pain**
- **Fear**

**Phase 2: stunning and killing**

**Phase 3: bleeding**

→

**Welfare consequences assessed:**

- **Pain**
- **Fear**

EFSA Journal

SCIENTIFIC OPINION

ADOPTED: 22 September 2021

doi: 10.2903/j.efsa.2021.6882

# Welfare of sheep and goats at slaughter

EFSA Panel on Animal Health and Welfare (AHAW),
Søren Saxmose Nielsen, Julio Alvarez, Dominique Joseph Bicout, Paolo Calistri,
Elisabetta Canali, Julian Ashley Drewe, Bruno Garin-Bastuji, Jose Luis Gonzales Rojas,
Christian Gortázar Schmidt, Mette Herskin, Miguel Ángel Miranda Chueca, Barbara Padalino,
Paolo Pasquali, Helen Clare Roberts, Hans Spoolder, Karl Stahl, Antonio Velarde, Arvo Viltrop,
Christoph Winckler, Denise Candiani, Cristina Rapagnà, Yves Van der Stede and
Virginie Michel

# Main Welfare Consequences

## Heat stress

- **Panting**:
- **Salivation** or drooling
- **Sweating**

## Cold stress

- **Shivering**

## Restriction of movement

# Hazards, preventive and corrective measures

Arrival

| Hazard | Hazard origin/s | Hazard origin specification | Preventive measures | Corrective measures |
|---|---|---|---|---|
| **Too high effective temperature** | • Equipment<br>• Facilities<br>• Staff | • Lack of skilled operators<br>• Environment<br>• Not enough ventilation in the truck<br>• Prolonged waiting time<br>• Too low space allowance | • Staff training<br>• Increase space allowance<br>• Scheduling to avoid hottest hours of the day for transport<br>• Unload without delay following the arrival<br>• Provide adequate ventilation to the truck at arrival<br>• Protect from adverse weather conditions. | • Provide adequate ventilation or/and cooling systems<br>• keep the vehicle moving<br>• park at right angle to wind direction<br>• park in the shade<br>• prioritize unloading |
| **Too low effective temperature** | • Equipment<br>• Facilities<br>• Staff | • Lack of skilled operators<br>• No protection from the environment<br>• Prolonged waiting time | • Staff training<br>• Prepare the vehicle according to weather conditions (e.g. closing the openings in the truck, providing bedding material)<br>• Avoid coldest hours of the day for transport<br>• Unload without delay following the arrival<br>• Provide adequate shelter to the truck at arrival place | • Provide protection when the animals are on the truck<br>• Unload the truck without delay and bring the animals to a thermal neutral zone (with heaters) |
| **Insufficient space allowance** | • Staff | • Lack of skilled operators<br>• Too many animals are put in the truck compartments | • Staff training<br>• Adjust the number of animals to size of the compartment | • Unload the animals without delay |

# Main Welfare Consequences

## Handling stress

- Escape attempts
- Reluctance to move
- Turning around or moving backwards/ turning back
- Vocalization: Bleating in goats and vocalisation in lambs

## Injuries

# Hazards, preventive and corrective measures

Unloading

| Hazard | Hazard origin | Hazard origin specification | Preventive measures | Corrective measures |
|---|---|---|---|---|
| **Inappropriate handling** | Staff | • Lack of skilled operators<br>• Improper handling of animals<br>• Use of electric prods | • Training of staff for proper handling<br>• Staff rotation<br>• Appropriate equipment to move animals<br>• Use of leader sheep | • Instruct the operator to stop inappropriate handling<br>• Implement staff rotation, or<br>• Slaughter the animal without delay |
| **Improper design, construction and maintenance of premises** | Facilities | • Too steep slope<br>• Lighting<br>• Slippery and/or dirty floor or ramp<br>• Absence of solid lateral protection<br>• Presence of a gap between the vehicle and the ramp | • Ensure maintenance of the area<br>• Rebuild the unloading area to accommodate animal behaviour | • Clean the slippery floor or ramp<br>• Provide sawdust or straw to make it non slippery<br>• Slow down unloading process |
| **Unexpected loud noise** | Staff | • Staff shouting and making noise<br>• Dog barking | • Identify and eliminate the source of noise<br>• Avoid dogs<br>• Staff training<br>• Avoid personal shouting | • None |

# Main Welfare Consequences

- Restriction of movement
- Resting problems
- Group stress
- Prolonged hunger and thirst

# Hazards, preventive and corrective measures

Lairage

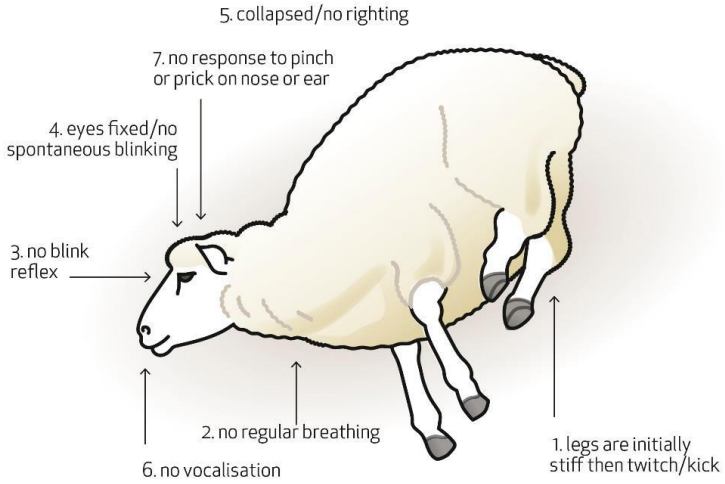
| Hazard | Hazard origin/s | Hazard origin specification | Preventive measures | Corrective measures |
|---|---|---|---|---|
| **Too long food deprivation** | Staff | Prolonged food deprivation prior to transport<br>Prolonged transport and/or prolonged waiting time at slaughterhouse<br>Prolonged lairage time | • Training of staff<br>• Avoid feed withdrawal before and during transport and waiting time prior to slaughter.<br>• Scheduling slaughter of animals;<br>• Prioritizing slaughter.<br>• Providing food when a delay is expected in the slaughter process | • Slaughter without delay<br>• Provide food |
| **Too long water deprivation** | Staff, facilities | Water not accessible prior to transport<br>Prolonged transport<br>Absence of effective watering in lairage | • Training of staff<br>• Water availability until loading of farm<br>• Water availability during transport<br>• Provide access to water in the lairage and check the functioning of the watering system. | • Slaughter without delay<br>• Provide water |
| **Unexpected loud noise** | Equipment, facilities, staff | Staff shouting<br>Machine noise<br>Poor design and layout of the premises | • Identify and eliminate the source of noise<br>• Training of staff<br>• Avoid personnel shouting<br>• Proper machine construction<br>• Avoid noisy equipment close to the animals | • Warn the staff |
| **Insufficient space allowance** | Staff | Too many animals are put in the pen | • Training of staff<br>• Display notice regarding number of maximum animals in each pen regarding the category | • Adjust the number of animals to the size of the pen |
| **Mixing unfamiliar animals** | Staff and facilities | Mixing animals from different origins | • Keep familiar animals together from farm to slaughter<br>• Do not mix horned animals | • Remove aggressive animals,<br>• Slaughter mixed groups without delay |

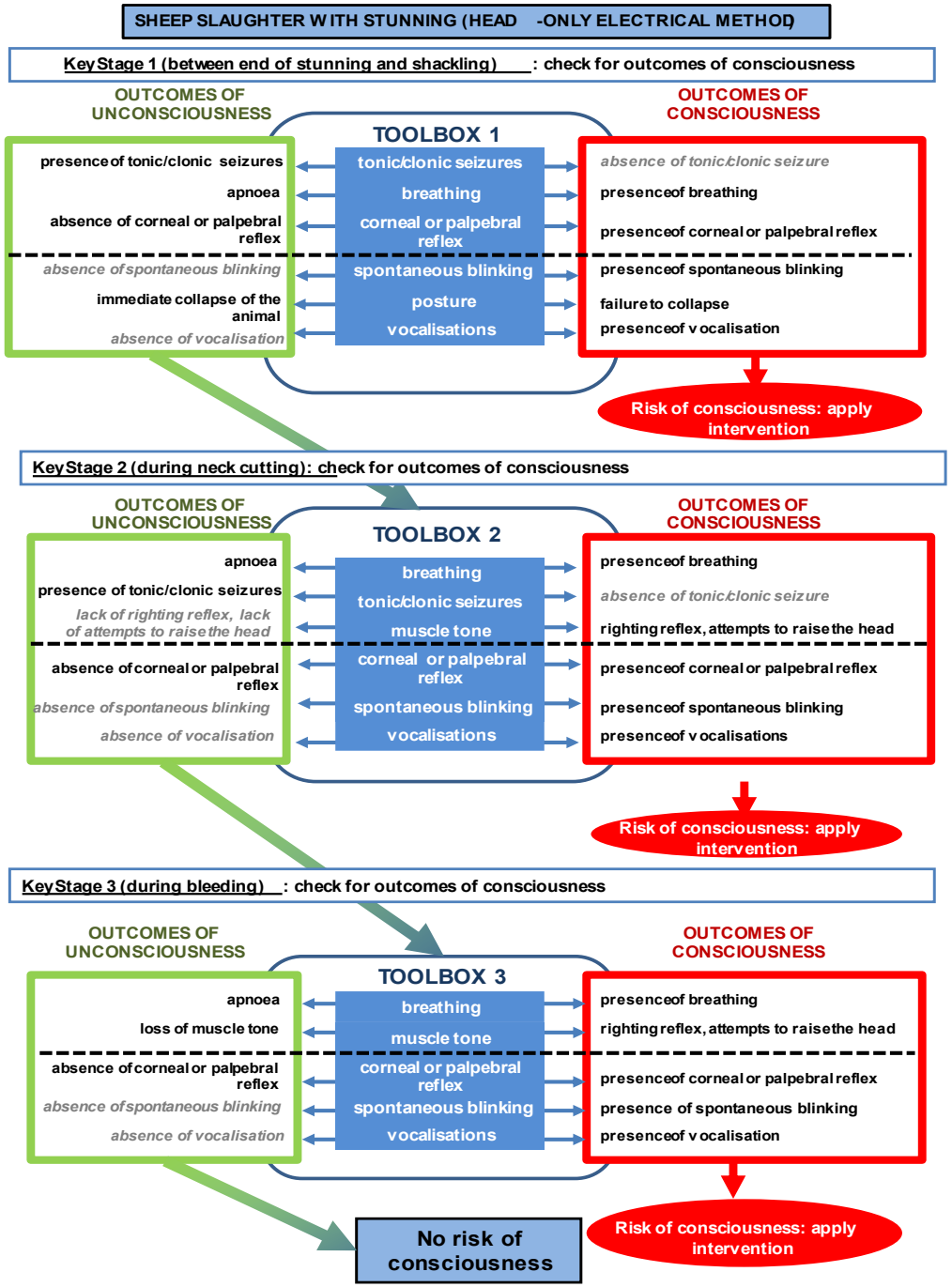
# Main Welfare Consequences



- Handling stress
- Injuries
- Prolonged hunger and thirst
- Group stress
- Resting problems
- Thermal stress

# Electrical stunning



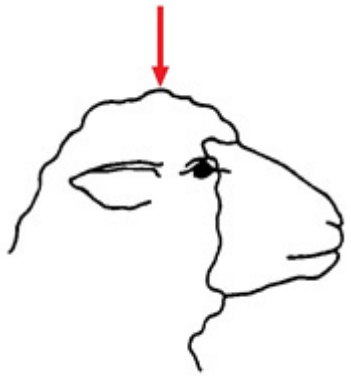



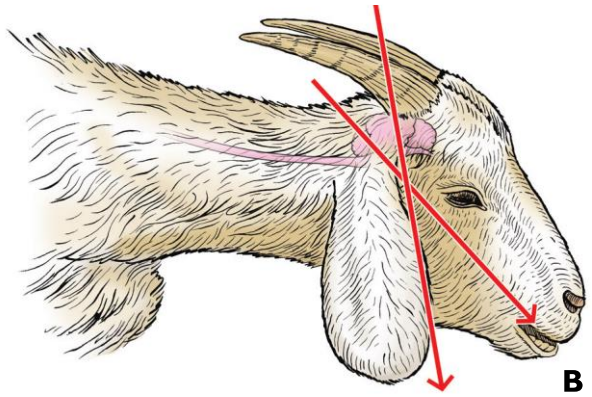
# Hazards, preventive and corrective measures

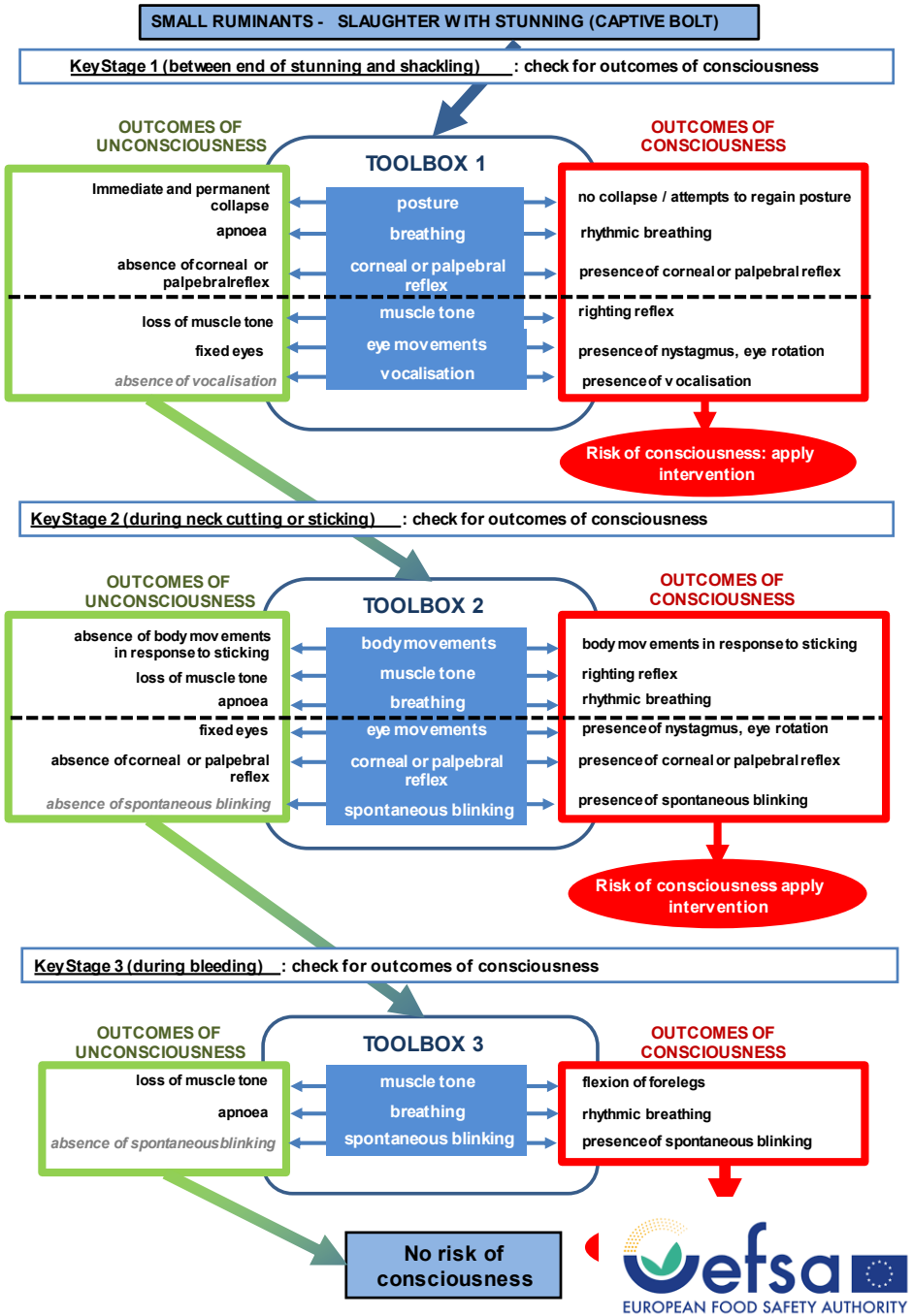
| Hazard | Hazard origin/s | Hazard origin specification | Preventive measures | Corrective measures |
|---|---|---|---|---|
| **(Inappropriate) restraint** | Staff, equipment, facility | Presentation of the animal to the method is required | • Use optimal restraint according to the size of the animal | • Keep the duration of restraint to the minimum<br>• Reduce the pressure |
| **Wrong placement of the electrodes** | Staff, equipment | Failure to adjust the equipment to suit the size of animal<br>Lack of skilled operator<br>Improper restraint | • Adjust / synchronise the equipment<br>• Training of staff | • Use of a back-up method |
| **Induction of cardiac arrest in conscious animals** | Staff | Ineffective stunning or prolonged interval between the two current cycles | • Ensure effective of stunning<br>• Apply cardiac arrest current cycle without any delay | • Re-stun the animal |
| **Poor electrical contact** | Staff, equipment | Lack of skilled operators<br>Poorly designed, constructed and maintained equipment<br>Intermittent contact<br>Burning of the wool | • Training of staff<br>• Ensure correct presentation of the animal<br>• Ensure correct maintenance of the equipment<br>• Ensure the equipment includes appropriately sized electrodes<br>• Ensure continuous contact between the electrodes and the head<br>• Ensure regular calibration of equipment<br>• Regular cleaning of the electrodes<br>• Wetting of the fleece/wool | • Use of a back-up method |
| **Too short exposure time** | Staff | Lack of skilled operators<br>High throughput rate | • Staff training<br>• Reduce throughput rate<br>• Ensure a timer is built in the stunner to monitor the time of exposure or use of a visual or auditory warning | • Use of a back-up method |

# State of consciousness

## mechanical stunning



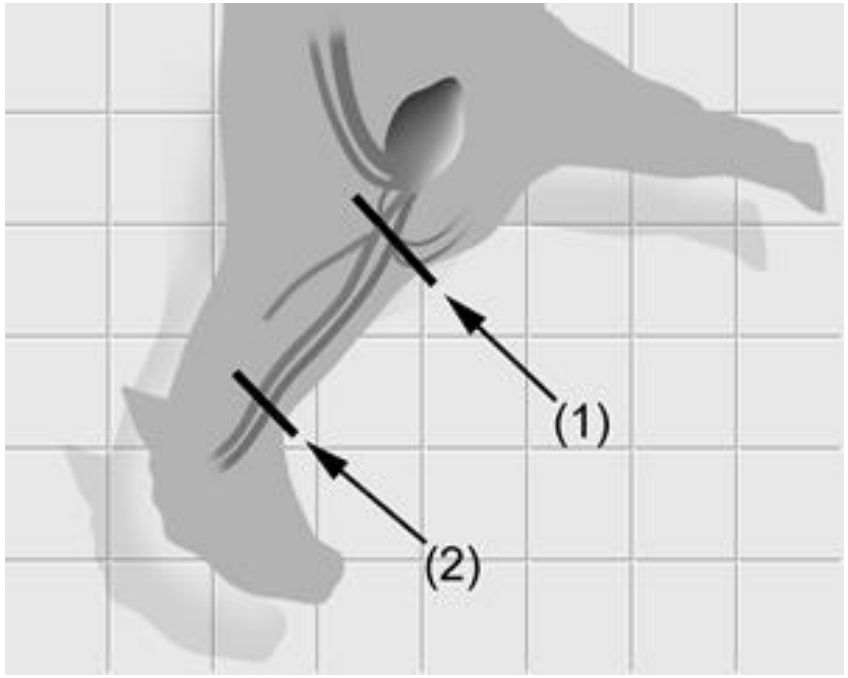


# Hazards, preventive and corrective measures

| Hazard | Hazard origin/s | Hazard origin specification | Preventive measures | Corrective measures |
|---|---|---|---|---|
| **(Inappropriate) restraint** | Staff, equipment | Immobilisation of the animal and presentation of the head of the animal to the operator are required | • Use passive head restraint or use optimum pressure to the head and the body according to the size of animal in active restraint | • Keep the duration of restraint to the minimum<br>• Reduce the pressure |
| **Incorrect position and direction of the shot** | Staff | Lack of skilled operators<br>Operator fatigue<br>Poor restraint<br>Inappropriate placement of the gun due to the shape of the head | • Staff training and rotation<br>• Appropriate restraint of the animal<br>• Proper placement of the gun | • Stun in the correct position and with the correct direction. |
| **Incorrect captive bolt parameters** | Staff, equipment | Lack of skilled operators<br>Wrong choice of equipment<br>Inappropriate cartridge and power<br>Poor maintenance of the equipment<br>Too narrow bolt diameter<br>Too short bolt low bolt velocity | • Staff training<br>• Appropriate restraint of the animal<br>• Ensuring equipment is fit for the purpose<br>• Regular maintenance of equipment | • Stun with correct parameters, or<br>• Apply backup method |

# Bleeding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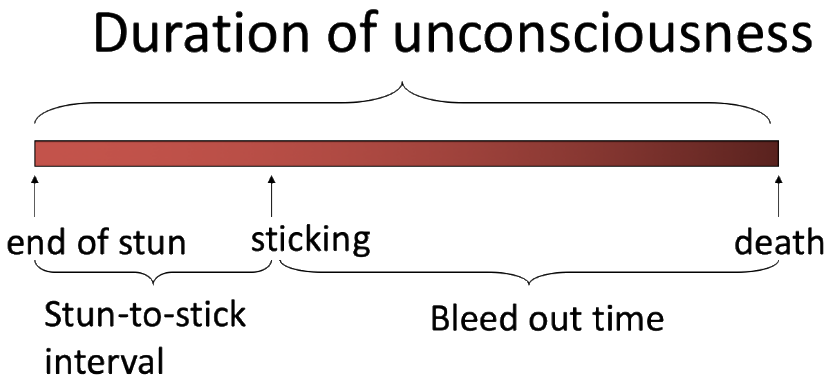
Duration of unconsciousness
end of stun
sticking
death
Stun-to-stick interval
Bleed out time

# Hazards, preventive and corrective measures

| Hazard | Hazard origin/s | Hazard origin specification | Preventive measures | Corrective measures |
|---|---|---|---|---|
| **Prolonged stun-to-stick interval** | Staff, equipment | Lack of skilled operator<br>Delayed hoisting and sticking of animals<br>Positioning of the stunner too far away from the bleeding rail | • Training of staff<br>• Speedy hoisting of animals after stunning<br>• Prompt and accurate cutting of brachiocephalic trunk/carotid arteries shortly after stunning? | • Re-stunning |
| **Incomplete sectioning of the carotid arteries or brachiocephalic trunk** | Staff, equipment | Lack of skilled operators<br>Blunt or short knife<br>Narrow sticking wound | • Training of staff<br>• Use of sharp knife long enough to reach brachiocephalic trunk and carotid arteries<br>• Ensuring brachiocephalic trunk is cut and carotid arteries<br>• Ensuring the sticking wound is large enough to facilitate profuse bleeding | • Correct cutting of brachiocephalic trunk and carotid arteries |
| **Sticking of conscious animals** | Staff | Lack of skilled operators<br>Ineffective stun or recovery of consciousness before sticking<br>Lack of monitoring of unconsciousness at the time of sticking<br>Electro-immobilization (in sheep) | • Proper stunning and short stun-to-stick interval<br>• Training of staff to monitor consciousness | • Re-stunning before sticking |
| **Dressing of animals while still alive** | Staff | Lack of skilled operators<br>Short bleeding time<br>Incomplete sectioning of brachiocephalic trunk or carotid arteries<br>Lack of monitoring of death before carcass dressing | • Training of staff to monitor death<br>• Ensuring death before dressing | • stop dressing and make sure the animal died before continuing if it is due to short bleeding time |

# Thank you for your attention

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