

- The advantages and disadvantages of the method used, taking into account the commercial and field conditions.

Two separate contexts are considered: stunning and killing methods used in slaughterhouses and those used for disease control measures.

Species referred to in the present opinion are: cattle, sheep, pigs, poultry, horses and farmed fish. Welfare aspects of the systems for stunning other species have not been included in the present opinion.

ASSESSMENT

A full assessment can be found in the Scientific Report published in the EFSA web site www.efsa.eu.int, which was drafted by a Working Group set up by the AHAW Panel. The Scientific Report is considered as the basis for the discussion to establish the conclusions and recommendations by the AHAW Panel, as expressed in this opinion.

CONCLUSIONS AND RECOMMENDATIONS

The Scientific Panel on Animal Health and Welfare concludes on the welfare aspects of the main systems of stunning and killing the main commercial species of animals as follows:

1. GENERAL

1.1. CONCLUSIONS

Most animals which are slaughtered in the EU for human consumption are killed by cutting major blood vessels in the neck or thorax so that rapid blood loss occurs. If not stunned, the animal becomes unconscious only after a certain degree of blood loss has occurred whilst after greater blood loss, death will ensue. The animals which are slaughtered have systems for detecting and feeling pain and, as a result of the cut and the blood loss, if not stunned, their welfare will be poor because of pain, fear and other adverse effects. The cuts which are used in order that rapid bleeding occurs involve substantial tissue damage in areas well supplied with pain receptors. The rapid decrease in blood pressure which follows the blood loss is readily detected by the conscious animal and elicits fear and panic. Poor welfare also results when conscious animals inhale blood because of bleeding into the trachea. Without stunning, the time between cutting through the major blood vessels and insensibility, as deduced from behavioural and brain response, is up to 20 seconds in sheep, up to 25 seconds in pigs, up to 2 minutes in cattle, up to 2¹/₂ or more minutes in poultry, and sometimes 15 minutes or more in fish.

In general, stunning methods induce temporary loss of consciousness and rely on prompt and accurate sticking procedures (bleeding out) to cause death. The duration of unconsciousness and insensibility varies between methods, species and animals.

Effective stun / kill methods on the other hand, which induce unconsciousness and death either simultaneously or sequentially, do not rely on bleeding to cause death.

Restraint of animals, needed to ensure proper application of mechanical or electrical stunning or stun / killing methods, can be one of the most stressful and painful stages of the slaughtering process. Therefore, the ability to move animals in groups with less handling and restraint is an advantage on welfare grounds of all gas stunning or stun / killing systems as compared with mechanical or electrical methods.

While carbon dioxide (CO₂) has many advantages, aversion (a tendency to show behaviour to avoid or withdraw from a situation which is associated with a noxious stimulus) to this gas at

some level (usually above 20%) is clearly a welfare problem. Depending on how one interprets an animal's behaviour it is difficult to quote a level from the published work that will apply to all pigs and poultry. However, it is likely that levels above 30% in pigs and turkeys and 25% in chickens are at the very least unpleasant and that higher levels are aversive.

1.2. RECOMMENDATIONS

Due to the serious animal welfare concerns associated with slaughter without stunning, all animals which are slaughtered should be adequately stunned in a humane way, whenever possible, so as to avoid poor welfare in the period before unconsciousness ensues. Effective stun / killing methods, when available and reliable, are preferred from an animal welfare point of view.

In all the stunning and stun / killing methods, animals should be restrained appropriately and heads properly presented to the operator for effective application of procedure(s) (excluding gas mixtures).

The stun-stick interval should be sufficiently short to induce death through blood loss before the animal recovers from the stun.

Sticking procedures vary between species. However, supply of oxygenated blood to the brain should be stopped as rapidly as possible.

No carcass processing or electrical stimulation to improve meat quality should commence until the animal is dead.

All operators involved with stunning and slaughter should be properly trained, their skills and knowledge examined, in particular in the field of welfare, and the person should be certified to be competent and should have a positive attitude towards improving animal welfare. They should also attend retraining courses and their ability to implement new knowledge and acquire new skills should be assessed as new technologies evolve.

All the equipment used for stunning or stun / killing should be maintained in good working conditions. Recorded evidence of maintenance and rectified defects should be kept.

1.2.1. Mechanical methods

When using captive bolt guns, colour codes indicating cartridge strength should be harmonised across manufacturers. Colour codes should be the same for the same species and age group (e.g. red for cows and horses, black for bulls).

Open cartridges should not be used as they can easily absorb moisture and lose their function. All captive bolt equipment, including cartridges, should be stored in appropriate conditions in abattoirs.

Bolt velocity should be measured regularly according to the manufacturers' specifications and appropriate field devices made available to ensure proper use in the field.

1.2.2. Electrical methods

All stunning and stun / kill electrical parameters should be based on sound science.

Electrical stunning tongs should be placed on the head such that they span the brain. Electrical stun / killing tongs (one cycle method) should be placed on the head and body such that they span the brain and the heart.

Electrical stunning and stun / killing devices should supply constant currents and should also be fitted with an acoustic or optic signal to indicate: (a) an interrupted stun, (b) excessively short stun duration or (c) increase in total electrical resistance in the pathway (due to dirt, fleece or carbonisation), which could lead to failure. This would facilitate effective monitoring of