

## Veterinary Animal welfare concerns in relation to slaughter practices

As part of the dialogue on religious slaughter a comprehensive report summarizes animal welfare concerns from the viewpoint of veterinary sciences in relation to slaughter practices. This includes neck cutting without stunning, but also slaughter practices with stunning prior to neck cutting and slaughter practices with stunning after neck cutting (post cut stunning).

The objective was to discuss and also evaluate the three different types of slaughter, in an unbiased and comparative fashion taking into account scientific findings and observations gathered by veterinarians under practical conditions.

In a first chapter **physiological basis** such as pain, fear and distress are reviewed as well as assessing consciousness, the process of dying and the physiology of exsanguination (bleed out). Symptoms of consciousness or recovery are listed in a table, including comments for practical applications with regard to slaughter practices. These are complemented by information on measurements and interpretation of brain electrical activity that are used under experimental conditions to determine the state of consciousness as well as assessing perception of pain in men and animals. The bleeding process is analysed and described including loss of blood volume and blood pressure, mechanisms of cerebral perfusion after the cut and possible impacts on the bleed out process. These comprise the state and patency of the sticking wound and the development and occurrence of occlusions of the vessels that may be responsible for prolonged consciousness. It becomes evident that there are manifold impacts on the quality of bleeding, some of which cannot be mitigated by the performance of the cut.

In a second chapter **principles and requirements of restraining** are discussed for all the slaughter methods. The ideal restraining method for slaughter depends on the species, slaughter speed and the capabilities of the staff. When a mechanical or electrical stunning method is applied restraining must allow the secure positioning of stunning devices. Restraint for slaughter without stunning needs to make sure that the neck can be stretched, so that an optimum cut is possible. It is also important, that the throat incision stays open to enable fast bleeding. Mechanical and chemical stimuli on the wound that could cause pain and distress have to be minimized as long as the animals have not yet lost consciousness. Heavy animals like cattle constitute a major challenge especially with regard to managing the restraint during and after the cut. Therefore special emphasis is placed on the consideration of pros and cons of different restraining methods and positions like upright, tilted or turning on the back.

The following chapter discusses the **different slaughter methods**. Concerning **slaughter without stunning** the question whether the cut is painful constitutes a major concern. Whereas the actual cut itself can only be evaluated using behavioural signs and questions remain about standardisation of cutting techniques. Recent scientific evidence is given by quantitative analysis of the electroencephalogram that immediately following the cut the animal can be subjected to noxious stimuli. This applies even to a good cut performed by a skilled operator. Risk factors for pain comprise multiple cuts, back up cuts, increased cutting time, a blunt blade, a blade with nicks, increased diameter of the neck, or excited animals moving their neck during the cut.

The time lag between reduced flow of blood to the brain and onset of unconsciousness depends on whether compensatory mechanisms of the body successfully and rapidly operate or whether they are overwhelmed by loss of blood. Findings are variable and there seem to be differences between the results of scientific studies conducted on a relatively small number of animals under controlled conditions. Methods applied in slaughter houses could show even more variations depending on operators and the range of individual characteristics of the animal.



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Most cattle seem to lose consciousness between 5 and 90 seconds after the cut, however even under laboratory conditions possible resurgence of consciousness lasting more than 5 minutes has been reported. Most sheep and goats seem to lose consciousness within 2 to 20 seconds after ventral neck cut, but investigations under practical but optimum conditions have revealed that some sheep have been able to show signs of recovery for up to 2 minutes. Most chickens lose consciousness between 12 and 15 seconds, but recovery is possible for up to 26 seconds after the cut. A major concern is, that animals will either experience pain or will be further processed and exposed to painful stimuli, e.g. released from restraint or shackled during the period they are still conscious.

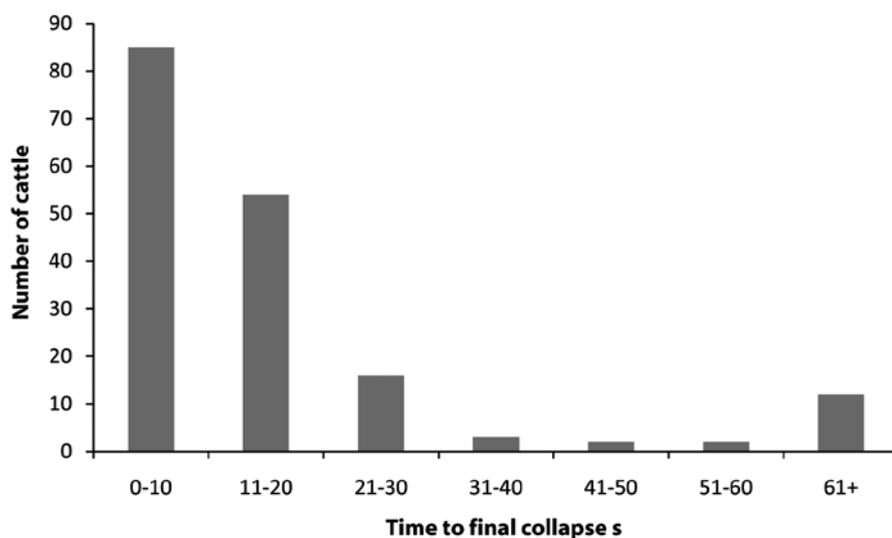
Signs during the period of post cut are also described and discussed with regard to indication of consciousness. So far patterns of clinical signs after the cut have been characterised but it is still difficult to define the exact moment the animal becomes unconscious only from the clinical picture.

### Example: False aneurysm



Example of a false aneurysm occluding the cardiac severed end of a carotid artery in cattle. Evidence is given that carotid aneurysms are at least partly responsible for prolonged consciousness in cattle following slaughter without stunning.

### Example: Time to collapse



Frequency distribution of the cattle according to time to collapse following halal slaughter without stunning under optimum practical conditions. Eight percent of the cattle took longer than 60 seconds to collapse, two out of 174 took more than 4 minutes to collapse (Gregory *et al* 2010, Meat Science 85, 66-69)

**Stunning methods** used in the context of religious slaughter, are extensively described including principles and effective use of the methods also in addition to risk factors and indicators of failed stunning. With regard to the reversibility of any method, effects on vital functions such as regular heart beat are also considered. A reversible stunning method, when applied correctly, such as electrical stunning is a humane method of rendering an animal immediately unconscious that should last until death supervenes by effective bleeding. A successfully stunned animal will not feel potential pain during the cut and subsequent bleeding. Nevertheless, the necessary technical requirements and skills must be met under routine conditions, and welfare can be poor in cases of noncompliance.

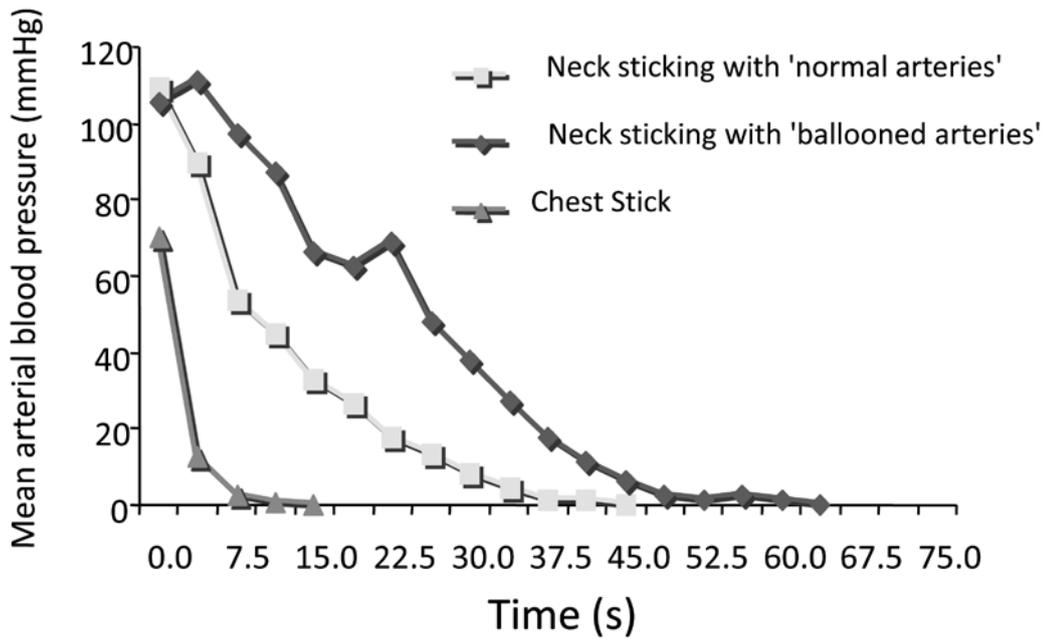
In the last chapter **conclusions** are given and a table is presented comparing the risks of different slaughter methods with regard to compromised animal welfare.

### Comparative ranking of risks with regard to compromised animal welfare due to different slaughter methods

Hazard	neck cutting without stunning	stunning prior to neck cutting	stunning post neck cutting
Pre slaughter handling stress	High	High	High
Restraint stress and injury	High	Low	Intermediate
Inadequate equipment	High	High	High
Lack of knowledge or skills	High	High	High
Pain and suffering during the cut	High	Low	High
Pain and suffering during the post cut period	High	Low	Intermediate
High slaughter line speed	High	Low	Low
Failure to diagnose of prolonged consciousness or inadequate stunning	High	Intermediate	Intermediate
Need for back up stunning in case of prolonged consciousness/ or failed stunning	High	Low	Low

Without making a value judgement it is concluded that *neck cutting without stunning* poses the highest risk for animal welfare because restraining for the cut and during bleeding imposes extra manipulation to the animal. Additionally, pain, suffering and distress during the cut and during bleeding are highly likely. The latter is partly reduced during *stunning post neck cutting*. Although stunning methods themselves involve risks to animal welfare which have to be managed, *stunning prior to neck cutting* represents the lowest risk for overall compromise of animal welfare.

### Example: Blood pressure after sticking



Blood pressure in calves following different sticking methods with or without carotid occlusion (Anil *et al*/1995 Meat Science 41, 113-123)

This report is based on studying more than 200 references.

Full report: K. v. Holleben, M. v. Wenzlawowicz, N. Gregory, H. Anil; A. Velarde, P. Rodriguez, B. Cenci Goga, B. Catanese B. Lambooi; Animal welfare concerns in relation to slaughter practices from the viewpoint of veterinary sciences. Dialrel-deliverable 1.3, [www.dialre.eu/dialrel-results](http://www.dialre.eu/dialrel-results)

The DIALREL project is funded by the European Commission and involves partners from 11 countries. It addresses issues relating to religious slaughter in order to encourage dialogue between stakeholders and interested parties. Religious slaughter has always been a controversial and emotive subject, caught between animal welfare considerations and cultural and human rights issues. There is considerable variation in current practices and the rules regarding religious requirements are confusing. Consumer demands and concerns also need to be addressed and the project is collecting and collating information relating to slaughter techniques, product ranges, consumer expectations, market share and socio-economic issues. The project is multidisciplinary and based on close cooperation between veterinarians, food scientists, sociologists, and jurists and other interested parties.

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The text represents the views of the author(s) and does not necessarily represent a position of the Commission, who will not be liable for the use made of such information.

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