

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

In the Name of Allah, Most Gracious, Most Merciful

Benefits of religious slaughter without stunning for animals and humans

Bibliographical report on religious slaughter and the welfare of animals - March 24th 2008 / The 17th of Rabia, 1429 A.H.

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"... Evaluation of religious slaughter is an area where many people have lost scientific objectivity. This has resulted in biased and selective reviewing of the literature. Politics have interfered with good science."

GRANDIN & REGENSTEIN (1994)

"... In the United States, strategies for the halal trade are highly developed, due to multiculturalism, a greater role for minorities in speech and business practices, and because opposition to religious slaughter has never been truly manipulated by anti-Semitic and racist groups."

Florence. BERGEAUD-BLACKLER,
Cahier d'Economies et Sociologie Rurales (In French) (INRA Web site, 2004)

"...The conclusions of all the scientific experiments converge towards one firmly supported certainty: properly carried out, religious slaughter is the most humane way because there is less trauma when killing an animal to consume its meat"

S. MR. POUILLAUDE,
"L'abattage rituel en France (In French) ",
Thesis for the School of Veterinary Surgeons, Toulouse (1992)

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Introduction

At the tenth session of the Islamic Council of Jurisprudence of the World Islamic League held in Mecca from Saturday, 24 Safar 1408 A.H. / October 17, 1987 to Wednesday, 28 Safar 1408 A.H. / October 21, 1987, the issue of the use of electric discharges (electronarcosis) during the slaughter of animals was considered. The Council issued a fatwa that tolerates electronarcosis under very strictly controlled conditions: animals previously electrocuted should not die before the bleeding causes death nor should there be any pain during application of such an electrical current.

Today, a great number of scientific studies and observations in the field (i.e., at slaughterhouses) show that in no case can electronarcosis be beneficial to either humans or animals. Moreover, the research shows that religious slaughter by direct bleeding is the most beneficial method for animal welfare, the quality of meat, and environmental safety, as well as people's health. In 1999, the European Council of Fatwas and Research made it unlawful for Muslims to eat meat coming from poultry and cattle stunned before bleeding is complete (please see the fatwa (religious decree) in Appendix 1). In the same way, in September 2007, the Mondiale Islamique League (LIM) requested that the Great Council of Ulema, the highest religious authority in the Saudi Kingdom, promulgate a fatwa declaring it unlawful for Muslims to *"use electric shock before slaughtering poultry, sheep or cattle in European slaughterhouses. The LIM proposed "to create organizations of experts among the Muslim communities in Europe to control animal slaughter" [1].*

Unfortunately, some religious authorities in France, including the three largest Mosques (Paris, Evry and Lyon), certify religious slaughters with prior **stunning** of

animals by electronarcosis, basing their actions on older fatwas (1978 and 1987). Spurred by the French government, a standard AFNOR "NF HALAL" is expected to be promulgated, with implementation envisaged in September 2008 [2] (Note: currently there is no standard for halal meat or product and religious slaughter without stunning is allowed under an exemption granted to Jews and Muslims). Under pressure from some animal activist associations, electronarcosis may be imposed on Muslims within the framework of the slaughter of poultry.

With the range of religious opinions and interpretations, and with the "Halal" market booming, the most essential stakeholder, the consumer, has been sidelined. Indeed, the Muslim consumer knows little about the use of stunning in the preparation of halal meat. Generally the Muslim consumer is unpleasantly surprised when he learns of the use of such stunning processes for halal slaughter.

In the first part of this work, we will approach the religious aspects and the context of religious slaughter in France. In the second part, we will present scientific data on the advantages of religious slaughter, as well as discuss the problems related to stunning.

I Presentation of the religious aspect and the French context for religious slaughter

a) The religious duty and the right to eat properly slaughtered halal meat

Islam is a way of life, controlled by what is prescribed in the Quo'ran and by the traditions of the Prophet Mohammed (Peace Be Upon Him (PBH)). Our rules of food are well defined. While the consumption of meat is allowed, this concession is not without responsibilities. The classification of animals according to their character as well as their allowed or prohibited consumption, are clearly stated in the Quo'ran. The permission to kill animals, quoted in the religious texts, is accompanied by rules concerning their food and the good treatment of the animals during their rearing and of their sacrifice (religious slaughter). Slaughter consists, after having pronounced the name of Allah, of cutting at the same time the trachea, two carotid arteries, the oesophagus and two jugular veins of the animal with a very fast cut using a very sharp knife.

With respect to the practice of religious slaughter, there is within the Muslim community a debate concerning whether to permit stunning animals before slaughter. Such a stunning operation can be done with:

- **electrical stunning:** the animals is held with grips (see Figure 1-a) or placed into an electrified water vat (see Figure 1-b) (the process is also called **electronarcosis**),
- **mechanical stunning:** the animals becomes stunned with the assistance of a captive bolt, either penetrating or non-penetrating (see Figure 1-c),
- **gas stunning:** the animals are treated with carbon dioxide gas (CO₂) or other inert gases.

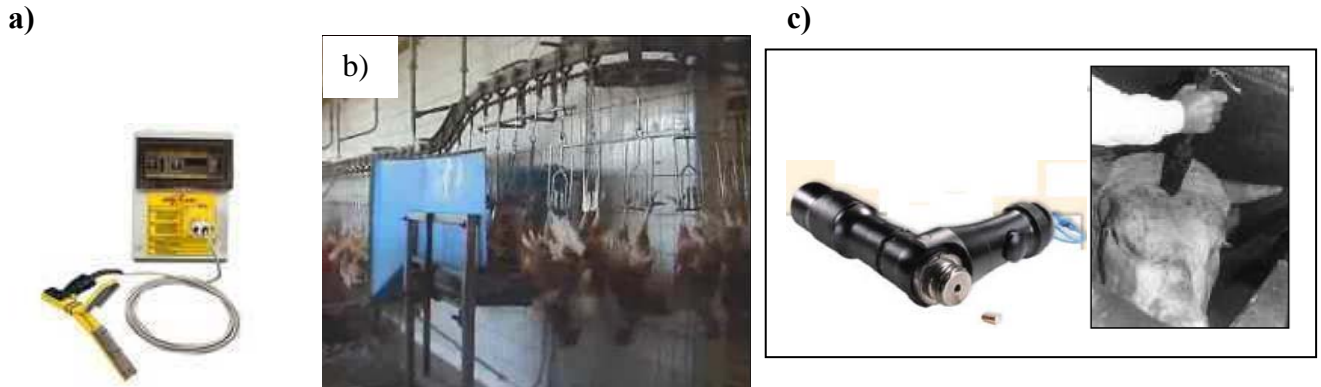


Figure 1. Various equipment used for stunning: a) grips to electrocute sheep (<http://www.termet.fr>) - b) vat for electronarcosis of poultry (in reference [3]) c) captive bolt gun (<http://www.termet.fr>)

In France, there is a great divergence among the various halal certifiers with respect to the use and application of any of these stunning procedures. For example, organizations affiliated with the Mosques of Paris and Evry authorize in their charters the use of electronarcosis before slaughter for all animals, while the Mosque of Lyon applies it only to poultry [4]. Other organizations, such as the AVS Association, the Halal Services and Al-Rissala, do not certify slaughter animals with prior stunning; considering this method haram (unlawful). All these organizations base their decision on religious opinions (fatwas) which either prohibit the practice of electronarcosis or which tolerate it under certain strict conditions, in particular, if the process is 1) considered reversible (i.e., the animal should not die and must be able to return to a normal life in the event that religious bleeding does not occur) and 2) there is an absence of suffering from the stunning process.

Scientific data often neglected and ignored by certain animal activist organizations, presented in chapter II, show that **prior stunning increases the suffering of the animals and that the control of the state of consciousness of animals is**

doubtful (i.e., for the slaughter to be valid, the animal must not have died before the bleeding).

Even scientists **encourage the use of religious sacrifice without stunning**. Reading these studies suggests that **the prior stunning is opposite to the Muslim regulations** (atrocious suffering, death of the animals before the bleeding, residual blood in the carcass, explosion of the blood vessels, and dispersion of the brain in the carcass).

We believe that the directives dictated in the Quo'ran and the Sunna (the words and actions of the Prophet Mohammed (PBH)) on religious slaughter are most natural and the more humane (i.e., the least painful for the animal) way to kill an animal. This lets us believe in the accuracy of the Divine coding of our practices: it is required that we follow the code in its totality and that we cannot select or choose to obey parts of these principles.

We have **the right to practice our faith as we believe it and understand it**, this right cannot be taken away from us nor can anyone **impose violation** on Muslims by requiring prior stunning for religious slaughter. This principle is well illustrated in article n°9 of the European Convention of Humans Rights and of Fundamental Freedoms [5], quoted below:

"Everyone has the right to freedom of thought, conscience and religion; this right includes freedom to change his religion or belief and freedom, either alone or in a community with others and in public or private, to manifest his religion or belief, in worship, teaching, practice and observance.

“Freedom to manifest one’s religion or beliefs shall be subject only to such limitations as are prescribed by law and are necessary in a democratic society in the interests of public safety, for the protection of public order, health or morals, or for the protection of the rights and freedoms of others.”

b) Islam and its requirements for the welfare of animals:

Islam includes lessons that can be useful to all those who defend the dignity of animals. In the Quo’ran, many suras bear the name of animals. One can quote for example the suras "the ants", "the spider", "the cow", "the bees"...

In a critical review of the book "The Animal in Islam", Éric Geoffroy (a researcher with CNRS: The National Center for Scientific Research, France) summarizes the relationship between man and animals in Islam [6]:

"a key verse of Quo’ran establishes the similarities, and, thus, the proximity which exist between humans and animals: "There is not an animal in the earth, nor a flying creature flying on two wings, but they are peoples like unto you" (6:38). The animal is very present in the accounts of Quo’ran, in particular those related to the prophets (Peace and Hello on Them). As for the Prophet (PBH), he taught the respect of animals to his Companions, privileging some of them, in particular, for their nobility (the horse) or their purity (the cat).

Under the terms of what preceded, the animal "communities" are the subject of particular care for Muslim lawyers, who consider all the species as protected. Thus, it is forbidden to kill an animal for pure pleasure, but only to nourish men: to apply the words of the Prophet (PBH), men should not strike animals, because "they pronounce the praise of Allah", and it is prohibited to curse domestic animals.

Since the animals suffer as well as men: their setting after death, which many theological debates have considered, can only be justified because of an exemption granted by Allah to man; therefore, the slaughter must meet precise religious standards".

Islam recognizes in the animal an advanced conscience. The animal is equipped with intelligence, it suffers, it knows Allah, it is aware of death and will be resurrected like the human.

"There is not an animal in the earth, nor a flying creature flying on two wings, but they are peoples like unto you. We have neglected nothing in the Book (of Our decrees). Then unto their Lord they will be gathered" (6:38).

The great consideration for the welfare of animals is also very nicely illustrated through authentic stories of the Prophet of Islam (PBH), of which some examples are quoted below:

- Al-Boukhari and Mouslim report that one day the children had attached a live bird to a target. Ibn Omar, a disciple of the Prophet (PBH) exclaimed: *"The Prophet cursed the one who uses any alive being as target"*.
- The Prophet (PBH) insisted strongly on the fact that misusing animals which one uses or encouraging them to fight is wrong. According to Islam, man certainly has the right to benefit from the resources of the earth, but he has the duty to do it with good intelligence and with kindness. This is why to organize fights between animals and to divert oneself with this kind of activity is unworthy of a human being. *"the Prophet prohibited organizing fights between animals"* (At Tirmidhi, Abou Daoud).

- The Prophet (PBH) also told how a person was thrown by Allah in punishment to the hereafter for having deliberately starved a cat: "Neither she had nourished it, nor had she released it, so it will nourish itself" (Al-Boukhari, Mouslim). He also told that another person had given drink to a dog that was thirsty and obtained Allah's forgiveness for his sins. "Would we be rewarded for the animals? Then the Prophet was asked by companions – is there a reward" and the Prophet answered for actions well done to any living beings, there will be a reward" (Al-Boukhari and Mouslim).

- The transport of animals must be done without abuse. Thus, the Prophet (PBH) said: "*When you travel in a green region, give to your camel its share from the ground. And when you travel in a dry region, hurry up to preserve the capabilities of your mounting*" (brought back by Mouslim, n°1926, At-Tirmidhi, n°2858, Abou Daoud, n°2569).

- When necessary to end the life of an animal, the Prophet (PBH) has asked that this be done without inflicting unnecessary pain. It has been banned to fire kill an animal, the Prophet asked that slaughter be done without making the animal suffer unnecessarily. He has thus banished killing by fire (Abou Daoud). He was also asked, about the case of necessity justifying the slaughter of an animal, and required that we give the animal a rapid death (Sahih At-tarhib Wat-tarhib). Having seen one day somebody who had immobilized an animal then sharpened his knife in front of it, he made this reproach: "So, you want it to die twice? Why didn't you sharpen your knife before immobilizing it?" (Sahih At-tarhib Wat-tarhib).

c) Unfounded and passionate positions of the opponents of religious slaughter

Religious slaughter without stunning is authorized in France via article 8 decree n°97-903 [7], resulting from European directive 93/119/CE:

Article 8. - the stunning of animals **is obligatory** before the slaughter or the killing, **except for the following cases: a) Religious slaughter b)...**

It should be noted that the authorization for religious slaughter has not always been in effect in France; religious slaughter without stunning was unfortunately prohibited in France from 1940 to 1944 under the occupation of Nazi Germany [8].

Currently, this exemption granted to the Jews and Muslims to practice their religious slaughter without stunning is again being challenged under pressure from animal activist organizations such as the O.A.B.A. (Oeuvre of Assistance to the Animals at Slaughterhouses) or the Foundation of Brigitte Bardot. The objectives of these group to prohibit religious slaughter are sometimes very passionate and personal: This is very well illustrated by a statement of Mrs. Bardot following a meeting with Mr. Nicolas Sarkozy about "his fight" to make stunning obligatory [9]:

"This fight is mine and I want to produce a result before dying It is essential because millions of animals are killed each day in France, in full conscience, in inadmissible and inhuman sufferings. We have, with Mr. Sarkozy, the same language, and he promised me I would not to be disappointed. I count on his energy, on his willingness to help me and to take charge of this file".

On the website of the Brigitte Bardot Foundation, the judgment against religious slaughter is not based on objective criteria. No scientific reference is mentioned and the arguments advanced are rather of an economic nature... In spite of the inaccuracy of the information provided, Mr. Sarkozy gave an answer favorable to these recommendations at the time of his presidential campaign in 2007 [10]:

"I have noted your satisfaction at having seen advancement of the file..., as I know that you would like that we go further, notably in systematizing stunning of animals. Indeed, it will be necessary in a spirit of dialogue with the representatives of Muslim associations and with respect of the traditions to succeed in imposing this type of practice as I already announced it to you in mail on 22 December last."

One also finds a lack of objectivity in the work of the O.A.B.A. which focuses on the Quo'ranic interpretations made by Dr. Right Aldeeb Abou-Sahlieh, who is not Muslim while working at the Swiss Institute of Comparative Law. They quote a selection of research work, that has not been reproduced, to prove the "reversibility" of electronarcosis; while disregarding problem arising from this method [11].

It would be interesting if these associations would look at the religious opinions of the various religions commentators and also prove the reversibility of electronarcosis at the slaughterhouse level.

The sociologist Noélie VIALLES notes that within the professional field, electronarcosis is far from receiving unanimous approval, nor do all animal welfare scientists agree that it can be routinely done reversibly [12]:

"In addition, we hear the reflections of professionals daily confronted with slaughter who take refuge initially behind the lawful requirements. Then they expose their perplexity: **one can cause suffering while stunning, one can be compassionate while bleeding directly. Essentially, concludes one (prudently or sincerely?) that when it "is well done" direct bleeding gives a very fast death, but requires a very qualified slaughterman; stunning, in terms of the current situation, requires less expertise, but if the stun is unsuccessful, it is very likely more painful than direct bleeding**"[12].

She also shows **an obvious difference between the approaches of the animal activist associations: The animal welfare conscious Muslim slaughter companies in Russia and America** have apparently **adopted the direct bleeding method** following scientific studies, unlike the European associations which chose the obligatory stunning [12]:

"It is only more interesting to stress that they have found enough scrupulous protectionists to seek which was really, for the animals themselves, the least painful process. Since 1980, on the initiative of the Association for the Protection of Animals of Saint Petersburg, scientific studies were undertaken, which showed the superiority of religious slaughter for the humane treatment of animals. With good logic, the direct process of bleeding was consequently adopted by the SPCA (Animal Welfare Associations) of Russia and the United States of America. Nevertheless, the majority of the countries of Europe on the contrary have legislated in the direction of obligatory stunning.

This paper also highlights the recent work, presented in chapter II, which shows that with good conditions of slaughter (improvement of the transport conditions,

and the equipment and operations in slaughterhouses), **religious slaughter without prior stunning is the least painful method for the animal and for humans**; it does not neglect the interests of the animal nor does it pose a medical risk for the consumer [12]: “the last study on the issue dates, as to the best of my knowledge, from 1992, and provides nothing for any legitimate concern of the protectionists. The thesis of this veterinary surgeon (Pouillaude-Bardon 1992:82) is summarized thus: "The Jewish method of slaughter, if it would be compared with the other methods (...) is by far gentler and faster, with the proviso of ensuring a non-traumatic casting and restraint". But she further observes: "in any case, associations of animal welfare estimate in a unanimous way that the stunning of the animals before the bleeding ensures unconsciousness and anaesthesia; the possible pain caused by the current processes of stunning does not seem to be considered. Laws, while making compulsory as a pre-condition stunning of the animal (except with an exemption), makes official this opinion and almost raises it to the level of a dogma".

II. Scientific data on traditional slaughter, religious slaughter and religious slaughter with preliminary stunning

a) Improvement of the industrial process of religious slaughter

Dr. Temple Grandin, the world's foremost livestock handling specialist, has undertaken very interesting studies on the conditions of animals in slaughterhouses. She, specifically, issued the following recommendations for religious slaughter [13], [15]:

1- Steps are needed to allow the animal to be kept calm and to reduce stress and fear (applicable to religious slaughter and to slaughter with stunning):

- Optimization of the design of the slaughterhouse (proper lighting, non-slipping flooring, solid walls, non-reflective surfaces, minimization of noise).
- The use of immobilization systems for the body (keeping the animal upright) and to keep the head from moving during slaughter.
- The use of an automatic conveyor: While being handled quietly and calmly, the cattle voluntarily enter the slaughter box: "the cattle place their head in a holder that is specifically designed for the purpose and controlled by a trained operator". It should be noted that Dr. Grandin has designed and built boxes dedicated to religious slaughter (see Figure 2) which are widely used in the United States and elsewhere.

2-The perception of the pain during the incision:

- Use of a very sharp knife, with a length at least equal to double the width of the neck (e.g., 12 to 14 inches for sheep and goats and up to 18 inches for cattle).
- An adequately trained and experienced restraining box operator.

- A fast, aggressive cut minimizing the number of continuous strokes.
- In that case, there is no reaction by the *animal during the incision.* "It seems that the animal is not conscious that its throat is cut".

3- Time to loss of sensibility:

- The calm cattle collapse quickly (often after 10 to 20 seconds, average 17 seconds) and they have a faster onset of insensibility.
- The simultaneous cutting of the two carotid arteries and the two jugular veins (as required by the religious rule) reduces, significantly, the time to loss of sensibility. By carrying out a fast cut, 95% of the calves collapses almost immediately [14].
- The best operators are able to cause bovines to collapse in 10 seconds [16].
- Conversely, with a slow cut the animal remains conscious for more than 30 seconds, in more than 30% of the cases.

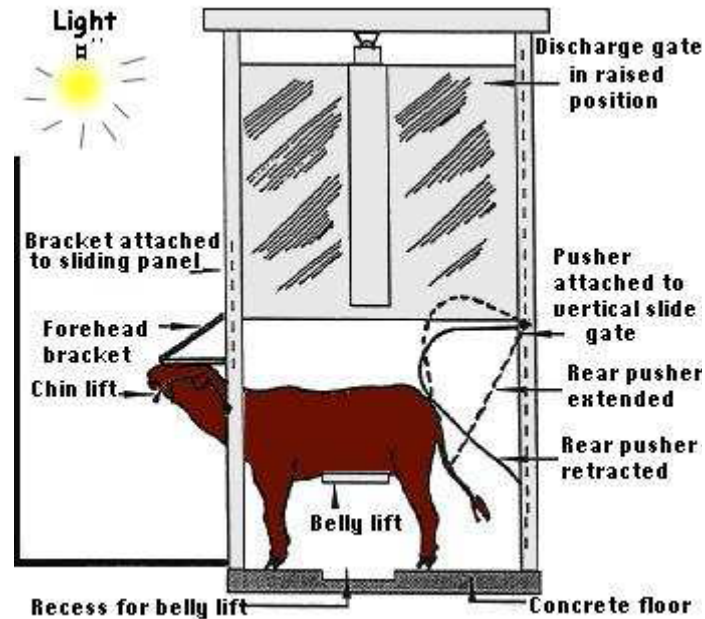


Figure 2: General diagrams of the ASPCA BOX for religious slaughter (<http://www.grandin.com>)

Thus, if attention is paid to the design, construction and operations of the slaughterhouse, with a staff trained and aware of the methods of handling animals; religious slaughter is very compassionate to animals.

b) The perception of pain in animals at the time of religious slaughter without or with stunning

Those opposed to religious slaughter often disregard dedicated scientific work on religious slaughter, such as those studies published by Grandin and Regenstein [13] and by Schulze and Hazem [14] from Germany. With respect to French studies, one can also quote the theses of veterinary doctors Pouillaude-Bardon [17] on “Religious Slaughter in France” and of Luc [23] on ”Jewish Religious Slaughter and Animal Welfare”.

Although direct bleeding is very different from pre-slaughter stunning, we would like to note that Muslims do not do this with the idea of making their animals suffer. Quite to the contrary, it is perceived as being the most natural method and the least painful.

Professor Schulze and Dr. Hazem [14] of the University of Hanover undertook a comparative study of various methods of slaughter: religious slaughter by direct bleeding and slaughter with stunning using a gun ("captive bolt") followed by bleeding. To measure in an objective way the pain, the authors took care to obtain an electroencephalogram (EEG) and an electrocardiogram (ECG) for each animal.

The experiments show that recordings of the EEG done on the animals slaughtered by direct bleeding did not show any change between the moments before the bleeding and after the bleeding, thus clarifying the fact that the animal does not feel pain during and after the incision (measurements were taken on 17 sheep and 10 calves). The state of unconsciousness (major sleep) is detected between 4 and 6 seconds for sheep and around 10 seconds for the calves. The flat EEG (brain death) is reached after 13 seconds for the sheep and 23 seconds for the calves. The ECG showed an increase in the heart rate to 240 beats per minute in the 40 seconds after the bleeding of the sheep and 280 beats per minute in the 40 seconds after the bleeding of the bovines, which correlated with the phenomena of convulsion of the body as is generally observed.

Concerning the measurements taken on the stunned animals (6 sheep and 5 calves), serious disturbances were observed in the EEG after the application of the gun. The flat EEG is reached after 28 seconds for 4 calves. They also noted the following phenomenon for two sheep: whereas the activity of a half of the brain is

stopped, the other part presents intense activity until the bleeding stops. The bleeding that occurred after stunning resulted in a stopping of cerebral activity. Recordings of the ECG showed values higher than 300 beats per minutes after stunning. More over, differences were observed during measurements of pain by thermal stimulation carried out on some animals: nothing was detected after the direct bleeding, while an increase in the pain was observed for a sheep after the stunning.

The authors concluded that if the direct bleeding is done well (adequate equipment, and a cut that is deep and rapid), it is more effective than the stunning by gun (i.e., the flat EEG was reached more quickly); and that methods of direct bleeding, following these studies should be reconsidered by European authorities so that religious slaughter is not an "exception" within the framework of religious freedom but is in fact a more humane form of slaughter.

Other measurements of the EEG during direct bleedings were studied in the thesis of S. Mr. Pouillaude [17]; the results are presented in Table 1. The author makes the same observations: no modification of the EEG at the time of the incision, the state of unconsciousness is reached after 5 seconds for sheep and calves. Brain death is detected at the latest after 32 seconds for the sheep, and at less than 25 seconds for 4 calves and at 45 seconds for 1 calf. For S. Mr. Pouillade, the loss of consciousness is directly related to the loss of irrigation of the brain: *"In 2,5 to 5 seconds after sticking, the data shows similarities with those of sleep. Then of anaesthesia: the frequency of the waves notably decreases, and their amplitude increases; the animal thus sinks into unconsciousness very quickly after the cut, which also causes no modification of the EEG. The phenomenon of a fast loss of*

consciousness is due to the rapid stopping of the cerebral irrigation, which involves the fast anoxia of the brain and the stopping of its operation".

SECTIONING of the BILATERAL CAROTID OR RELIGIOUS SLAUGHTER					
	Normal Frequency	Normal Amplitude	Time of Modification	Modified Frequency	Modified Amplitude
S H E E P	14 to 41 c/s	4 to 118 μ V	2.5 seconds	8.30 c/s	18-128 μ V
			5 seconds	3.5 – 15 c/s	20-190 μ V
				Unconscious animal	
			32 seconds	Flat EEG: Stoppage of cortical function	
C A L V E S	20 to 35 c/s	4 to 130 μ V	3 seconds	11-26 c/s	12-200 μ V
			5 seconds	4 – 19 c/s	30-260 μ V
				Unconscious animal	
			45 seconds (25 seconds for 4 calves out of 5)	Flat EEG: Stoppage of cortical function	

Table 1: Evolution of the state of the animal during and after sticking for sheep and calves [17]

Moreover, S. Mr. Pouillaude emphasized in his work the obvious difference of the level of stress felt according to each type of slaughter (see Figure 3). The glycemia remains normal at the time of religious slaughter. A hyperglycemia is noted in the other cases, this translates to a state of stress of the animal [17].

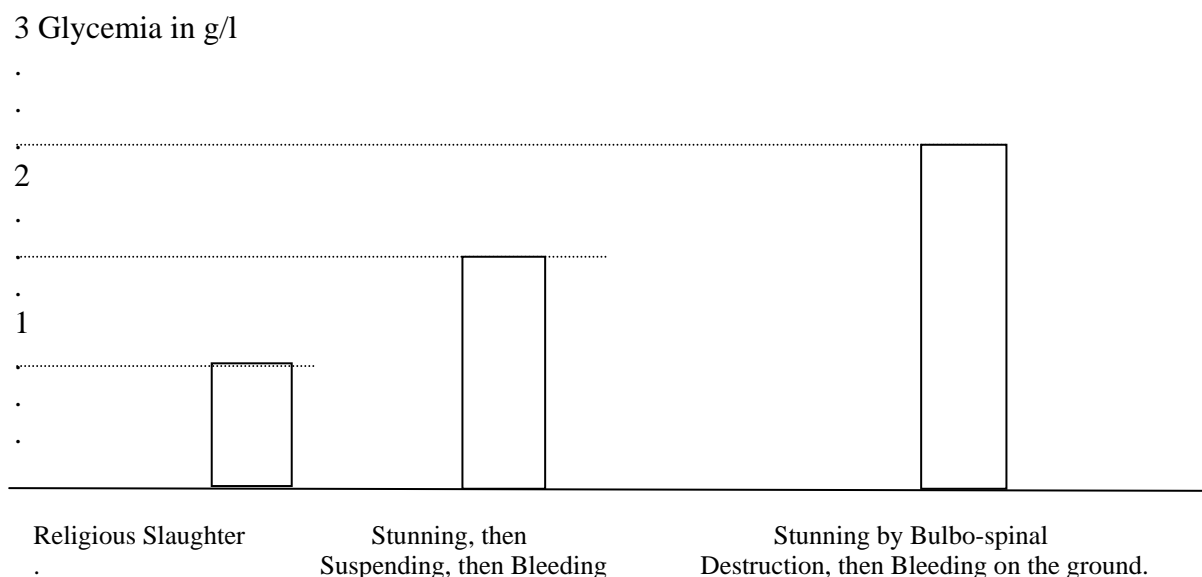


Figure 3: Evolution of stress: measurements of glycemia in the blood of the animal during slaughter by various methods [17]

As for the perception of pain, the quality of the equipment used and the speed of slaughter are significant factors:

"When the instrument is well sharpened and the slaughter is fast, the incision does not cause in the animal a defensive movement and there is no immediate reaction (...). On the contrary, voluntary defensive movements were observed in stunned animals at the moment when the knife is inserted in the animal to slice the chin-strings and the carotids" [17].

Following the collection of these scientific data, S. Mr. Pouillaude comes to the following conclusion: *"religious slaughter would thus be a less stressing mode of slaughter. Conclusions of all the scientific experiments converge towards a firmly supported certainty: properly carried out, religious slaughter is the most humane*

way because it leads to less trauma to animals to be killed to be consumed for its meat" 17].

With the evaluation of these scientific studies on religious slaughter, one can only note that religious slaughter is at least equivalent to the other methods of slaughter and possibly even better. One must wonder why there is antipathy towards this method of slaughter so that European citizens of the Jewish and Muslim faiths are forced to practice their religious slaughter as an "exemption" when it has been proven to be at least "equivalent" to the other processes.

The same conclusions are reached in the thesis on “Jewish Religious Slaughter and Animal Welfare” by Michel Luc (National Veterinary School of Lyon) [23] on the method of direct bleeding within the framework of religious slaughter (namely shechita, the Jewish method of religious slaughter that is almost identical to that of the Muslims):

"the French and European regulations do not grant to them, however, the right of their existence but only by way of an exemption from the obligation of slaughter with preliminary stunning. We are astonished by this precarious statute, because the results of physiological research studies on shechita and on other modes of slaughter would justify an equality of rights".

c) Uncertainty about the beneficial role of stunning and problems involved in its application

There are several methods of stunning animals. Each of these methods has its inherent problems and its rate of failure. For more information, the reader can find in Appendix 2 a summary table of the methods of stunning and problems of each of

them with respect to animal welfare as published recently as an official document by the OIE (the Animal World Health Organization)" [18].

Uncertainty about the beneficial role of stunning animals

The prior stunning of animals is generally considered in Europe as being the least painful method of slaughter. But are we really **certain** that **stunning is the most beneficial for animals** or are we simply responding to **emotional and passionate judgements**?

For the sociologist Noémie Vialles, the stunning is appreciated much more by the public as it is less spectacular and consequently appears to be less painful, but without assuring the public that it is actually an efficient process [12]:

"Generally, the analyses of people who are supposed to know conclude that it is not certain concerning the stunning prior to bleeding; but that the spectacle of the direct bleeding appears to be more violent and painful to the human observer, thus humans should watching it, whatever the results are for the animal. What stunning eliminates, most surely, is therefore human discomfort.

"If there is suffering it is at the time of stunning, it is so short and brutal for the animal that it has no time "to feel it". However, these appearances should be checked. Scientists are much less assured. It is true that the stunning removes any signs of visible suffering or, more exactly, any interpretable movement in terms of suffering".

A very relevant question is raised by NR Vialles about the efficiency of the insensibilization: **Does the processes of stunning remove suffering itself, or the possibility to manifest it?** [12]

She puts forward an evaluation of certain methods classically used to evaluate pain, and, in particular, **the exploration of the reflexes of the eyelid, cornea and the legs**. Suppression of these reflexes at the time of stunning can come from a driving paralysis directly induced by these methods (e.g., electronarcosis) without modifying cerebral functions [17]. In the case of religious slaughter, the animal can be insensitive to the pain because of brain death (flat EEG) but these reflexes can persist for one to three minutes (sheeps and calves) [17].

By way of illustration, one can quote the work of Schuzle et al. (see part II-b): Calves slaughtered by direct bleeding show brain death (flat EEG) at the latest after 23 seconds, while for calves slaughtered with a captive bolt gun the flat EEG is reached after 28 seconds. Thus, in spite of the misleading appearance of "the effectiveness" of stunning by captive bolt (i.e., the immediate collapse of the animal, without convulsion of the body, or of bloodshedging...), the brain death does not occur until later than that by religious slaughter.

In his thesis the veterinary surgeon Mr. Luc [23] affirms that the absence of pain during stunning is not firmly proven, and it is further estimating that the disturbances observed when measuring the EEG at the time of the stunning must be regarded as a sign of pain:

"Nothing indicates that the electric discharge is not by itself painful and felt at least during the time necessary for analgesia, when it exists. There are even question raised in the case of the captive bolt. That is, there are as many difficult questions as for the case of religious slaughter, especially with the use of the EEG as a tool in both cases (mechanical and electric stunning) with disturbances inherent in the method itself: such as electrical disturbances, and cranial impact that make

interpretation difficult. Nevertheless, experiments in human clinics show that such traumas, although not unequivocal, would suggest that they are painful".

In addition, there is also the opinion that the total motor activity of the animal does not constitute a criterion for the absence or presence of suffering: "... *drugs, electricity or fear can produce a paralysis of the voluntary muscles so that the animal cannot move or shout. The sensitive parts of the nervous system, are, however, not affected*".

Studies also show the inhumane characteristic of certain methods of stunning. For example, Blackmore (1982) concludes that "head only" electric stunning" (method illustrated in Figure 4) has serious concerns:

"the electric stunning of calves by the 'head only' method is inhumane under all circumstances" [21]



Figure 4: Electrocutation of a lamb by the "head only" method. (www.islamonline.net)

Application of electronarcosis and questions about its "reversibility"

The Muslim Council of Great Britain raised the following points concerning the rates of failure and the problems inherent in stunning [19]:

- A resumption of stunning is difficult to realize and exposes the animals to considerable pain and stress.
- An improperly stunned animal cannot be detected and passes through the slaughter while being conscious in a process conceived for animals that are supposedly "not-conscious".
- Stunned animals (by the method of electrocution to the head only) regain consciousness before slaughter – the time from stunning is not necessarily respected. Grandin advises slaughter within 10 seconds after stunning (whereas other sources advise 20 seconds). In practice, the time from electrocution to slaughter is difficult to control. Consequently, great suffering will be endured by millions of animals (almost 1 out of 5) that will regain some degree of consciousness and will pass through a mechanical procedure conceived for unconscious animals (see Table 2 below) leading to significant pain and stress.

Animal	Total numbers of stunned and slaughtered animals	Stunned animals found to be conscious during slaughter	
		number (in million)	Percentage (%)
Bovines	2,3 M	0,23	10
Sheep	18,7 M	5,0	26,7
Pigs	16,3 M	1,8	11,0
Total	1 37,3 M	7,03	19,0

Table 2: Number of animals found conscious during slaughter, in millions [19]

With respect to France, are there any studies on the extent of the phenomenon of "return of consciousness"? What is the status of the devices for electronarcosis in France? Are there any investigations, or figures?

Following a bibliographical study on the method of "reversible" stunning, the Academy Veterinary in France suggests that *"pigs, cattle, and sheep thus remain in a "reversible" state of insensitivity after electrocution. If the cutting of the jugular is carried out quickly, as required in the code of practices, in the 15 to 20 seconds which follows the application of the electrical current, the animal is insensitive and dies of haemorrhaging"* [20]. Reading of this conclusion, one must wonder whether the practical conditions of commercial slaughter are ready to rigorously maintain the time between the electrification and the bleeding of the animal, thus either risking a return of consciousness (the electric discharge was then used only to increase the suffering of the animal) or the death of the animal (electrocution, which is invalid for religious slaughter). Religiously slaughtered animals have been proven scientifically to be insensitive when it dies of haemorrhaging. Why does it have to undergo an additional suffering with useless electrification?

The fatwas that tolerate electronarcosis suppose that the process does not cause the death of the animal before the bleeding and does not influence its health, i.e., it would be able to return to a normal life if the bleeding is not carried out. A stunning that is known as "reversible" is supposed to meet these criteria. **This concept of reversibility is difficult to clarify knowing that the effectiveness of the stunning depends on many factors (size of the animal, species of the animal, state of stress and tiredness, amperage and frequency of the electrical discharge, time of application of the discharge, speed of the slaughter chain, quality of the contact of the electrodes with the animal, ...)**

In the slaughterhouse the control of the reversibility is very empirical, as we can note in the schedule of conditions of one of the organizations providing certification: *"the voltage can be lowered by the controller in the event of tiredness or of stress noted on a batch of poultry being slaughtered"* [4].

Furthermore, studies show alarming figures that worry the Muslim consumers because of the high lack of "reversibility" of electronarcosis. They noted **three possible situations after electronarcosis: a third of the poultry died, a third were in a state of unconsciousness and the last third were in a state of consciousness** (FAWC 1982) [22]. With the existence of these figures, how can one guarantee to the consumers, for a continuous processing chain with birds with different conditions that sorting between the dead and the unconscious animals occurs? Given the number of significant parameters involved, it seems very difficult to use laboratory criteria under industrial conditions.

The European Council of Fatwa and Research has issued a fatwa concerning the prohibition of consuming poultry slaughtered by preliminary stunning because of the significant number of birds that die before slaughter (see Appendix 1).



Figure 4: The poultry slaughter line before the vat where electronarcosis occurs, where one notices the way in which a bird can avoid electrification (www.islamonline.net)

d) Risk to the health and the safety of humans

"Religious slaughtered animals give a better hygienic quality of meat. Differences between a normal meat and a religious meat lie primarily in the speed of appearance of pH 5,4 and the rigor mortis, in the persistence from these two characteristic, and in the water content, less in the case of the halal meat" [17].

e) Scientific description of religious slaughter

“Then, by using a very, very sharp knife (which should be kept like a surgeon’s knife in sharpness and cleanliness, as previously stated by Dr. Ghulam Khan (UFAW, 1971)), a *deep swift cut* is done instantaneously and quickly to the blood vessels of the neck (the two caroid arteries which carry blood to the brain and head, the two jugular veins which bring blood from the brain back to the heart), the trachea (windpipe) and the oesophagus (gullet), but the central nervous system (the

spinal cord) should be kept safe and intact (not cut).” (Paragraph translated from reference [21].)

This deep, large cut through all the blood vessels of the neck *causes acute blood loss and haemorrhagic shock*: we know the blood is under great pressure, especially in the big carotid arteries (systolic pressure) and at high speed and, according to physical law, the pressure always goes from the higher to lower resistance - the point of the cut is the point of low resistance for blood to and from the brain. As there is a fully intact, alive heart, most of the blood is going to be pumped and poured out quickly under pressure leading to a rapid *fall* in the blood pressure. Thus depriving the brain of its main source of oxygen and glucose, and with no blood which is necessary to keep the animal alive and functioning and able to deal with any perceptive sensation this leads to anoxia and almost *immediate loss of consciousness* (anesthetization or “*stunning*”). The cerebrospinal fluid pressure falls even more rapidly than the blood pressure because of the jugular veins being cut, which results in a deep shock and *further loss of consciousness*.

The animal at this stage after the cut is in a *stable and quiet state with no movement* or any distressed behavior. One would assume, if there was any pain or suffering, it would kick, move or show signs of agitation. After this short resting phase, and because the brain is deprived of oxygen and blood due to the huge amount of bleeding, the heartbeats increase to increase the flow of blood to the brain and other deprived areas. Tonic and clonic involuntary contractions and convulsions start and occur as automatic physiological reflexes to send and push blood, especially to the brain. These contractions and convulsions are ‘painless’ (not, as the layman would imagine, that the kicking is due to the pain) especially when the animal is already unconscious and still has an intact spinal cord with functioning nerves to the limbs, muscles and organs. So, there is a huge amount of bleeding from the initial cut

followed by more blood loss due to the continuing squeezing pressure of these contractions and convulsions, leading to maximum bleed-out and less retention of blood in the carcass, giving a better quality of meat [both safer and healthier (this is like the direct method of slaughter, “*but without stunning*”)].

I would like to end this section of my talk with at least one testimonial from, for example, Lord Horder GCVO, MD, FRCP, who explained this type of slaughtering scientifically (and without the use of stunning):

‘The animal loses consciousness immediately. It is difficult to conceive a more painless and rapid mode of death; for a few seconds after the cut is made, the animal makes no movement, its body is then convulsed, the convulsive movements continue for about a minute and then cease. The interpretation of this fact is clear: the cut is made by a knife so sharp and so skillfully handled that a state of syncope with its associated unconsciousness follows instantaneously upon the severing of the blood pressure. The movement of the animal which begins at about 90 seconds are epileptiform in nature and are due to the blood-less state of the brain (cerebral ischemia with complete anoxaemia). Sensation has been abolished at the moment of the initial syncope.’”

Conclusion

Scientific studies to examine the degree of reversibility of the different slaughter methods and to examine the anaesthetic effects of slaughter show that there are uncertainties with respect to animal welfare. In fact, intervals of the duration of insensitivity of the animal vary according to the author and even sometimes according to the individual (animal) in the work of a single research group.

Even the techniques used to detect insensibility may be inappropriate. For example, the exploration of the palpebral, corneal and legs reflexes can induce errors in the event of animal paralysis: suppression of these reflexes during conventional slaughter can come from driving paralysis (e.g., due to electrification), without a modification of the phenomena of centripetal conduction of the nerve impulse and integration of cortical function [17], [23]. However, death of the brain following the haemorrhaging within the framework of religious slaughter is more obvious. The maximum time (via measurements of the EEG) that a sheep needs to enter a phase of unconsciousness is 7 seconds.

Therefore, it would be more beneficial to direct our efforts towards the development and improvement of the structures within the slaughterhouses and to the improvement of slaughter restraining systems. Grandin thinks it is often a matter of improving the restraining system. After thirty years of practical experiments: *"in my opinion according to what I observed through several methods of restraint of the animal, this last is the one which answers best the welfare of the animal than the cut in itself"* [16]. From this point of view, stunning can be quite simply considered as a mask of the ill-treatment of the animal within the industrial framework. Concerning the Muslim religious slaughter in France, S.

Mr. Pouillaude recommends reopening some of the smaller slaughterhouses to devote them to Muslim religious slaughter which would be managed locally [17].

Finally, several scientific studies note the equivalence between religious slaughter and other methods of stunning with respect to the animal's welfare during the time just prior to death. Religious slaughter is even regarded as the less traumatic method according to several noted French veterinary surgeons. It is thus remarkable that it is not allowed to be practiced freely without depending on an exemption and that there is not a real equality of rights between religious slaughter (without stunning) and the other methods of slaughter with prior stunning.

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Appendix

Appendix 1: Fatwa of the European Council for Fatwa and Research No. 29, 5th Session
meeting in Koln / Germany – 22 and May 29, 1999

Translation of the Fatwa:

After a detailed discussion about this issue (the consumption of meat of cattle and poultry in European markets and restaurants), which caused much debate and many disagreements about the conditions when it is sold in the marketplace, the Council agreed that the Muslims must observe the conditions of the sacrifice in the way they are described in Islamic jurisprudence in order to satisfy Allah, glory with Him, to preserve their religious personality and to protect themselves from the consumption of unlawful foods. And after the exposure to the methods of slaughter used and owing to the fact that many transgressions of the religious rules occur, causing the death of a significant number of animals (following stunning), especially poultry, the Council agreed that it is not allowed to consume the meat of poultry and cattle; on the other hand sheep and small calves may be stunned as the method of their sacrifice does not differ, in some countries, from that used for religious slaughter. And the Council recommends Muslims to have their own slaughterhouses in Westerners countries in order to be quiet aware of the religious and cultural personality of these facilities.

**Appendix 2 (source: OIE The Animal World Health Organization - <http://www.oie.int>
: http://www.oie.int/eng/normes/mcode/en_chapitre_1.7.5.htm)**

Summary analysis of stunning methods and the associated animal welfare issues

Method	Specific method	Animal welfare concerns/ implications	Key animal welfare requirements applicable	Species	Comment
Mechanical	Free bullet	Inaccurate targeting and inappropriate ballistics	Operator competence; achieving outright kill with first shot	Cattle, calves, buffalo, deer, horses, pigs (boars and sows)	Personnel safety
	Captive bolt - penetrating	Inaccurate targeting, velocity and diameter of bolt	Competent operation and maintenance of equipment; restraint; accuracy	Cattle, calves, buffalo, sheep, goats, deer, horses, pigs, camelids, ratites	(Unsuitable for specimen collection from TSE suspects). A back-up gun should be available in the event of an ineffective shot
	Captive bolt - non-penetrating	Inaccurate targeting, velocity of bolt, potentially higher failure rate than penetrating captive bolt	Competent operation and maintenance of equipment; restraint; accuracy	Cattle, calves, sheep, goats, deer, pigs, camelids, ratites	Presently available devices are not recommended for young bulls and animals with thick skull. This method should only be used for cattle and sheep when alternative methods are not available.
	Manual percussive blow	Inaccurate targeting; insufficient power; size of instrument	Competent animal handlers; restraint; accuracy. Not recommended for general use	Young and small mammals, ostriches and poultry	Mechanical devices potentially more reliable. Where manual percussive blow is used, unconsciousness should be achieved with single sharp blow

					delivered to central skull bones
Electrical	Split application: 1. across head then head to chest; 2. across head then across chest	Accidental pre-stun electric shocks; electrode positioning; application of a current to the body while animal conscious; inadequate current and voltage	Competent operation and maintenance of equipment; restraint; accuracy	Cattle, calves, sheep, goats and pigs, ratites and poultry	Systems involving repeated application of head-only or head-to-leg with short current durations (<1 second) in the first application should not be used.
	Single application: 1. head only; 2. head to body; 3. head to leg	Accidental pre-stun electric shocks; inadequate current and voltage; wrong electrode positioning; recovery of consciousness	Competent operation and maintenance of equipment; restraint; accuracy	Cattle, calves, sheep, goats, pigs, ratites, poultry	
	Waterbath	Restraint, accidental pre-stun electric shocks; inadequate current and voltage; recovery of consciousness	Competent operation and maintenance of equipment	Poultry only	
Gaseous	CO2 air/O2 mixture; CO2 inert gas mixture	Aversiveness of high CO2; respiratory distress; inadequate exposure	Concentration; duration of exposure; design, maintenance and operation of equipment; stocking density management	Pigs, poultry	
	Inert gases	Recovery of consciousness	Concentration; duration of exposure; design, maintenance and operation of equipment; stocking density management	Pigs, poultry	

Summary analysis of slaughter methods and the associated animal welfare issues

Slaughter methods	Specific method	Animal welfare concerns/ implications	Key requirements	Species	Comments
Bleeding out by severance of blood vessels in the neck without stunning	Full frontal cutting across the throat	Failure to cut both common carotid arteries; occlusion of cut arteries; pain during and after the cut	High level of operator competency. A very sharp blade or knife of sufficient length so that the point of the knife remains outside the incision during the cut; the point of the knife should not be used to make the incision. The incision should not close over the knife during the throat cut.	Cattle, buffalo, horses, camelids, sheep, goats, poultry, ratites	No further procedure should be carried out before the bleeding out is completed (i.e. at least 30 seconds for mammals). The practice to remove hypothetical blood clots just after the bleeding should be discouraged since this may increase animal suffering.
Bleeding with prior stunning	Full frontal cutting across the throat	Failure to cut both common carotid arteries; occlusion of cut arteries; pain during and after the cut.	A very sharp blade or knife of sufficient length so that the point of the knife remains outside the incision during the cut; the point of the knife should not be used to make the incision. The incision should not close over the knife during the throat cut.	Cattle, buffalo, horses, camelids, sheep, goats	
	Neck stab followed by forward cut	Ineffective stunning; failure to cut both common carotid arteries; impaired blood flow; delay in cutting after	Prompt and accurate cutting	Camelids, sheep, goats, poultry, ratites	

		reversible stunning			
	Neck stab alone	Ineffective stunning; failure to cut both common carotid arteries; impaired blood flow; delay in cutting after reversible stunning	Prompt and accurate cutting	Camelids, sheep, goats, poultry, ratites	
	Chest stick into major arteries or hollow-tube knife into heart	Ineffective stunning; inadequate size of stick wound inadequate length of sticking knife; delay in sticking after reversible stunning	Prompt and accurate sticking	Cattle, sheep, goats, pigs	
	Neck skin cut followed by severance of vessels in the neck	Ineffective stunning; inadequate size of stick wound; inadequate length of sticking knife; delay in sticking after reversible stunning	Prompt and accurate cutting of vessels	Cattle	
	Automated mechanical cutting	Ineffective stunning; failure to cut and misplaced cuts. Recovery of consciousness following reversible stunning systems	Design, maintenance and operation of equipment; accuracy of cut; manual back-up	Poultry only	
	Manual neck cut on one side	Ineffective stunning; recovery of consciousness	Prior non-reversible stunning	Poultry only	N.B. slow induction of unconsciousness under slaughter without stunning

		following reversible stunning systems			
	Oral cut	Ineffective stunning; recovery of consciousness following reversible stunning systems	Prior non-reversible stunning	Poultry only	N.B. slow induction of unconsciousness in non-stun systems
Other methods without stunning	Decapitation with a sharp knife	Pain due to loss of consciousness not being immediate		Sheep, goats, poultry	This method is only applicable to Jhatka slaughter
	Manual neck dislocation and decapitation	Pain due to loss of consciousness not being immediate; difficult to achieve in large birds	Neck dislocation should be performed in one stretch to sever the spinal cord	Poultry only	Slaughter by neck dislocation should be performed in one stretch to sever the spinal cord. Acceptable only when slaughtering small numbers of small birds.
Cardiac arrest in a waterbath electric stunner	Bleeding by evisceration		Induction of cardiac arrest	Quail	
	Bleeding by neck cutting			Poultry	