

Dear Sirs/Madam,

I, on behalf of Halal Australia Pty Ltd, strongly recommend that as per the Islamic belief and practices as per Prophetic (Peace be upon him) tradition are concerned the animal that are being slaughtered using the traditional Islamic method such as hand slaughter using sharp knife (to inflict less pain and suffering and maximise the bleeding) and with other specific conditions and guidelines as recommended in Islam. The above method we Muslim believe is much humane to the animal we slaughter compared to the modern method of slaughtering and with stunning method such as electric, penetrative gun (irreversible) or by employing gas.

The gas stunning has been reported to be a major concern amongst the Muslim countries and the relevant Halal certification accreditation authorities in the Middle East such as UAE, GCC countries and KSA as well as in the South Asian countries such as Malaysia, Indonesia, Brunei and Singapore. However perhaps the article attached may shade some light on this specific topic. You may be aware of this article anyways.

Anyways I am attaching another article (Joint declaration) on this issue reported in the UK justifying that hand slaughter without stunning is an acceptable mode of slaughter than the mechanical slaughter of animal and with stunning. On the other hand I am also attaching another article from the USA to justify its position on mechanical slaughtering for your review. The declaration in both cases, however, were expected to make recommendations to conduct in depth research to validate the claim on this subject matter.

However as mentioned above, as a scientist we always prefer to conduct a thorough research on any topic as such nature using a proper research paradigm and protocol using a large sample size before making any responsible comments or deriving conclusion to the matter concerned. In this regard we would be happy to inject funds to the successful research proposal for the benefit of all parties concerned.

The world community responsible and commissioned to look after such pressing issues should make an well informed decision and determination based on the empirical research based evidence regarding this matter rather based on individual or groups perception or activists such as animal right group's visual observation only.

Having said that this is a matter of concern which is related to Islamic Jurisprudence so it would be better to seek fatwa (legal opinion) from the renowned scholars in Islam in the specific areas of expertise. And Allah (The Creator of Heaven and Earth and everything therein) knows best.

Should you require further assistance or clarification to the same please contact us again. Finally we would appreciate if you may kindly send us an acknowledgement along with the Senat precedence on the above matter for our reference.

We wish you all the best,

Dr. Muhammad M. Khan, PhD
M.Sc (Food Technologist), M.Pharm (Pharmacist)

CEO, Halal Australia

Chairman, Penny Appeal Australia
Chairman, Islamic Help Australia

The Fiqh Council of North America

February 15, 2006

Dr. Muhammad Ashraf
ISNA Canada
Toronto, Canada

Dear brother Dr. Ashraf:

Assalam 'alaikum wa rahmatullah.

I received your question about the permissibility of machine slaughtering of poultry according to Fiqh. My answer is as follows:

For the slaughter of the animals there are two main requirements according to the Shari'ah: 1. Tasmiyah, 2. Tazkiyah.

1. Tasmiyah is mentioning the name of Allah at the time of slaughter. If a person is slaughtering a few animals, he should pronounce Basmalah at the slaughter of every animal. If he is slaughtering a large number of animals, he should begin his work with Basmalah and keep repeating it as much as he can; but he does not need to recite it at every single slaughter.
2. Tazkiyah is purification of the animal from the flowing blood. This is done for most of the animals by slitting the throat up to the two arteries but without cutting the whole neck. The brain stem of the animal should remain connected to the body because this helps in pushing the blood quickly from the body.

If these two procedures are followed, whether by cutting by human hands or by some mechanical method, the slaughter is Halal and is called proper Dhabihah. With the more advanced technology, I believe that mechanical method as used for the slaughter of animals is more precise, fast, hygienic and less painful for the animals.

It came to my attention that during machine slaughter sometimes birds are passed through the circular knife without being properly slaughtered. Some people have said that this may occur 10-15% of times. In this situation, there must be good human supervision and any bird that is not adequately slaughtered should be slaughtered by hand.

Wallah a'lam.

Dr. Muzammil Siddiqi
Chairman, Fiqh Council of North
America

The use of Mixtures of the Gases CO₂, O₂, and N₂ for Stunning or Killing Poultry - Report of the Scientific Committee on Animal Health and Animal Welfare adopted 23rd June 1998

The use of mixtures of the gases carbon dioxide, oxygen and nitrogen for stunning or killing poultry

Background

1. The Scientific Veterinary Committee adopted a report on the Slaughter and killing of animals on 30 October 1996 (Ref. VI/1719/97). Methods for stunning and killing all food animal species were considered in that report.

2. In the case of poultry, the Committee considered two methods for gas stunning and killing poultry (Argon 1: >90% argon in air; Argon 2: a mixture of >60% argon and 30% CO₂ in air). Insufficient scientific information was available to consider other gas mixtures that could be used for stunning poultry species, although there was some evidence that some methods using carbon dioxide were inadequate. Reference was also made, at that time, to research which was underway into stunning or killing of poultry using mixtures of carbon dioxide, oxygen, and nitrogen.

Request for Opinion

3. The Scientific Committee on Animal Health and Animal Welfare is asked to report on the suitability, from an animal welfare point of view, of the use of mixtures of the gases carbon dioxide, oxygen, and nitrogen for the stunning and killing of poultry.

Methods examined

4. The Committee is aware of 5 methods involving combinations of various gases that are being used in the EU for stunning or killing of poultry, either for commercial or research purposes. However, in many cases there is no published scientific information available and in some cases research is still being carried out and so we have had to rely on work that has not always been peer reviewed in the absence of any other data. All methods involve the use of carbon dioxide at various concentrations which vary because while CO₂ is able to stun or kill, it is also irritant, for example, to mucous membranes of the nose and mouth due to the formation of carbonic acid. Consequently, researchers have been seeking an optimum concentration that will stun or kill in a reasonable time without being irritant. The 5 methods are as follows.

- Method 1: 40% CO₂ , 30% O₂,
30% N₂

The effects of exposing broiler chickens to this gas mixture for two minutes have been tested and the results reported at a scientific symposium (see Lambooi, 1997; see also EU-AIR, 1996; Lambooi et al., 1998, submitted for publication; Raj et al. 1998a)

- Method 2: 30% CO₂ , 20% O₂, 50% air

In this method, birds are exposed to the gas mixture for two minutes. As normal air contains about 21% oxygen the total oxygen content of the gas mixture in Method 2 is roughly the same as in Method 1.

- Method 3: 3 phases of carbon dioxide in air

This process involves exposure to increasing concentrations of carbon dioxide in air at around 20% CO₂ for approximately 30 seconds, then 40% CO₂ for 50 seconds, and finally 50% CO₂ for 30 seconds. This is in commercial use in Germany for the slaughter of broilers.

- Method 4: Method 1 followed by exposure to 80% CO₂ in air

This exposes birds to one minute of Method 1 (40% CO₂) followed by two minutes at 80% CO₂ in air (or 80% CO₂, 10% O₂, 10% N₂) and is being used commercially. The principle of this method is to first stun the bird with a non-aversive gas combination and then to kill it

while it is still unconscious with CO₂ which otherwise would induce severe irritation and aversion. This is in commercial use in Belgium and has been reported at a scientific symposium (Nieuwelaar & Hoen, 1997).

- Method 5: 45% CO₂, 55% air

This has been investigated as a research method and involves exposure to this gas mixture for more than 2 minutes if the birds are to be killed as opposed to stunned. Some published scientific evidence regarding the effect of exposure of culled layer hens and broilers to this gas mixture is available (Raj et al., 1990).

Stunning vs Killing

5. An important distinction between the methods is whether they stun or kill. Stunning methods are those which are reversible and where the animal will recover if it is not exsanguinated or otherwise killed after leaving the gas mixture. Killing methods, on the other hand, will guarantee that the animal will be dead at the end of the exposure.

6. When stunning methods are used, the stunned animal is killed by another method, usually by exsanguination after severing the carotid arteries and jugular veins. It is, therefore, essential that the killing should be completed i.e. the animal should have been

sufficiently bled out so that it never regains consciousness. Ideally both carotids and jugulars should be severed by the neck cut. However, in commercial poultry slaughter plants this does not usually occur as the cut is made on only one side of the neck by the automatic killer. Furthermore, in birds bled manually, like turkeys, both carotids are not regularly severed. Consequently, killing methods may be preferable as they ensure that birds do not regain consciousness, whereas with stunning methods the speed and duration of stunning in practical situations must be carefully evaluated and shown to be effective.

7. In respect of stunning, poultry present particular difficulties in that their respiratory physiology is such that they recover remarkably rapidly from many methods of gas stunning. For example, research has shown that broilers surviving two minutes in 45% CO₂ responded to comb pinch as early as 26 seconds after stunning, while broilers surviving argon anoxia responded as early as 15 seconds after exposure (Raj & Gregory, 1990).

8. A practical problem when stunning of poultry is desired, is that a proportion of birds actually die within the exposure time required to stun all birds effectively (eg. with gas mixtures containing 30% or more of CO₂). This has to be taken into account

where religious requirements demand reversible stunning.

Handling of Birds prior to Slaughter

9. Under the existing system of stunning by electrocution, it is necessary that birds be unloaded from the crates and hung upside down on shackles prior to stunning. The opportunity to avoid this procedure through the use of gas methods has obvious welfare benefits. Normally, in gas stunning or gas killing systems, poultry are transported to the slaughterhouse in crates which can be placed directly into the gas mixture. Therefore, one great advantage of using gas mixtures is that a minimum of handling is required with no need for additional handling of the birds (eg. hanging and shackling) necessary with the use of many other methods. Some handling of birds when they arrive at the slaughterhouse is unavoidable as meat hygiene regulations require that birds that arrive dead are separated. (Council Directive 71/118/EEC Annex I, Chapter VI, paragraph 33)

10. It is important when using gas methods to ensure that all birds are placed in the gas properly so they are rapidly exposed to the correct mixture. Therefore, measures need to be taken to ensure that birds are evenly spaced on a conveyor or, in the case of crates, are prevented from climbing on top of each other while entering the

chamber. In addition the design of the crate should be such that gas exposure is not hindered.

11. As some birds may not inhale a sufficient quantity of the mixture because of air trapped between clustered or bunched birds in crates or conveyors, and also because of biological variation in susceptibility to the effects of the gas, a small proportion of birds may not be stunned effectively. It is therefore essential, that slaughterhouses maintain a back-up system to kill birds which show signs of recovery after leaving the stunning unit or during bleeding.

Carcass Quality and Meat Quality

12. Safety of personnel and some aspects of carcass and meat quality which may not be relevant to animal welfare are nevertheless important factors in commercial acceptance of any method of stunning or killing.

13. We use the term Carcass Quality to refer to the extent of any defects caused by the stunning process, such as muscle haemorrhages or bone fractures; and Meat Quality to refer to aspects such as colour, pH, and texture.

14. Another advantage of gas stunning or gas killing methods, in comparison with electrical stunning, is that they may improve carcass and meat quality. However, gas stunning

and gas killing methods that induce a rapid loss of consciousness also result in convulsions (marked wing flapping) which may adversely affect meat quality and cause carcass defects (eg. fractures, haemorrhages), as well as being aesthetically unpleasant (see paragraphs 19 & 51).

15. Some changes in meat quality, such as colour, are noticeable with gas stunning or gas killing methods but these appear to be neither commercially significant nor detrimental eg. colour of some meat cuts and the liver due to residual blood (Uijttenboogaart, 1997). Stunning with CO₂ causes development of rigor after death to be slower, delaying maturation whereas the use of Argon based gas mixtures speeds up this process. This may have both advantages and disadvantages according to the specific meat processing to be employed. In general, argon stunning or killing appears to have additional benefits to the industry compared with other methods.

16. Another aspect of carcass quality is the efficiency of plucking and the resulting appearance of skin. These are related not so much to use of the gas method itself, but are related to transport and lairage conditions, as well as carcass cooling that takes place in the time between the death of the bird and the commencement of

scalding, scald water temperature and the efficiency of the pluckers.

Consideration of the suitability of each method

17. There are three important criteria against which any method of stunning should be judged:

- the stunning process itself should not impose undue suffering on the bird;

- the birds should be rendered unconscious and, therefore, insensible to any pain or mental distress that might be caused by subsequent procedures such as neck cutting and bleeding; and

- the birds should remain unconscious and insensible until death occurs.

18. Signs of distress and pain may be indicated by the degree of head-shaking (Zeller et al., 1988; Hoenderken et al., 1994; Erhardt et al., 1996; Raj, 1996a), gasping (Raj and Gregory, 1994), yawning (Erhardt et al., 1996), vocalisation (Zeller et al., 1988), sneezing (Hoenderken et al., 1994) and defecating (Zeller et al., 1988). However, some of these signs may simply reflect physiological responses or varying degrees of distress (see also paragraphs 34 & 50). For example, yawning indicating oxygen starvation; gasping indicating difficulty in breathing; head shaking and sneezing

indicating irritation; defecating indicating fear; and so have to be interpreted with caution. It has to be noted that these are not absolute criteria and that quantitative differences may be significant from a welfare point of view, as well as the time at which they occur. Thus with the 60% Argon/30% CO₂ mixture already judged to be acceptable by the Scientific Veterinary Committee, some of these signs occur in some birds at some point in the process.

19. Unconsciousness is a state in which animals will be insensible and so not be able to feel pain or experience mental distress and it is obviously important to determine this state accurately after exposure to gas mixtures or during bleeding. It may be judged in several ways eg. by the absence of Somatosensory Evoked Responses (SERs), by the absence of Visual Evoked Responses (VERs), and by the EEG (theta and delta waves tending to an isoelectric state). Consciousness may be indicated by open eyes with normal sized pupils, or behaviours such as head shaking, gasping for air, wing flapping, vocalisation. Wing flapping was observed before the onset of loss of posture when exposed to argon or Argon/CO₂ gas mixtures (Lambooij & Pieterse, 1997; Lambooij, 1998, personal communication) and may be an attempt to maintain balance and/or a response to anoxia. But marked wing flapping

may also be due to convulsions.

20. Whereas a positive response to a painful stimulus provides good evidence that an animal is conscious of pain, a negative response could be indicative of unconsciousness, or it might reflect deep analgesia with birds still being mentally aware. This would be relevant in relation to animals remaining unconscious for an adequate period of time between stunning and exsanguination. Raj and Gregory (1990) reported that 14% of chickens, surviving an exposure to 45% CO₂ in air for 2 minutes, failed to respond to comb pinching even after 6 minutes although they had regained consciousness. However, the majority of the 28 surviving birds (24 birds or 86%) responded to comb pinch within 30 seconds indicating a rapid return to a conscious and pain aware state. Consequently, more comprehensive evidence of unconsciousness than simple comb pinching is required and it would also be important to determine both the time that consciousness and sensibility was regained, as well as the proportion of birds in that state.

21. When poultry are to be stunned using gas mixtures whilst they are still in their transport containers or on a conveyor, the time between the end of stunning and neck cutting is likely to be longer than under electrical stunning systems where the birds are already

shackled when stunned.

Therefore, the feasibility of performing neck cutting and adequate bleeding of birds while they are still unconscious needs to be demonstrated under commercial conditions to avoid poor animal welfare.

22. Death of a bird would be evidenced by a complete cessation of breathing or of heartbeat or by permanent destruction of the central nervous system. In experimental validation trials on any method this might be interpreted as an absence of breathing or normal heart beat, or an isoelectric EEG, for at least 5 minutes.

23. When evaluating any method of gas stunning one might also consider it in the context of either a one or two phase system. In a one phase method, unconsciousness and death would be induced in a non-aversive mixture by an adequate stun time and killing. In a two phase method, unconsciousness would first be induced in a non-aversive mixture, followed by death or an adequate stun time in a gas mixture which could be aversive. If a 3rd phase is thought to be necessary because of occupational safety for humans to prevent excessive spillage of gas from the plumage of the birds as they are removed from the mixture, then its exposure time would be added to phase 2. Any of these ways would be acceptable from an animal welfare viewpoint, but

there may be practical difficulties that have to be addressed with any method that requires long time periods in the gas mixture.

24. In order to approve a gas method for stunning or killing poultry in slaughterhouses the following information, based on sound scientific evidence, is likely to be required for each gas mixture and for each species.

- The aversiveness of the method eg. through observations of behaviour, hormonal perturbances.

- The exposure times required to stun or kill effectively, based on evidence of unconsciousness or death.

- The appropriate neck cutting intervals from the end of the gas treatment which will avoid recovery of consciousness either before neck cutting or during bleeding.

- The effects on carcass and meat quality so that the gas mixtures are acceptable to the industry.

- The effects on workers' safety.

- The practicability of the method.

The application of Animal Welfare criteria to the above 5 carbon dioxide methods for chickens

- Method 1: 40% CO₂ , 30% O₂, 30% N₂ with an exposure time of

2 minutes

25. This is a method which stuns birds rather than kills them as exposure for two minutes induces unconsciousness but not death (an isoelectric EEG does not occur in this period). More importantly, Raj et al. (1998a) found that 2 out of 15 birds failed to lose SERs within this time period and so a significant proportion of birds might still be conscious at the end of the exposure. Furthermore, there is evidence that birds find 40% CO₂ aversive as work by Lambooj and Pieterse (1997) showed that a significant number of birds, almost as soon as they were placed in this gas mixture, shook their heads and started to gasp in an average time of 3 to 7 seconds, long before they lost consciousness as indicated by a loss of posture (EU-AIR, 1996).

26. It is also of concern that Raj et al. (1998a) found that broilers exposed to this gas mixture for two minutes regained consciousness as determined by the return of SERs and a positive response to comb pinching as early as 30 seconds after returning to atmospheric air. It is highly improbable that proper bleeding and killing could be guaranteed in this short time in a slaughterhouse and therefore it is properly a welfare concern.

27. It may be concluded from this research that the exposure period of two minutes is insufficient from an animal

welfare point of view. First, the rapid recovery of consciousness (within 30 seconds) means that birds must reach the neck cutter very quickly after leaving the gas mixture (eg. less than 10 seconds) and this may not be practical in a poultry slaughter plant. Secondly, there is evidence that birds find 40% CO₂ quite aversive.

28. It is possible that longer periods in 40% CO₂ would be satisfactory but it has to be noted that longer periods might cause practical difficulties in the abattoir but in the absence of research on these specific points it is not possible to draw any firm conclusions. Further research is needed to determine the ideal exposure time required to stun all birds effectively, as well as the interval between stun and neck cutting that will avoid recovery of consciousness. It is also necessary to see if the behavioural observations on the aversive nature of the mixture are corroborated through other studies, as well as the relevance of light and heavy gasping which has been noted (EU-AIR, 1996).

- Method 2: 30% CO₂ , 20% O₂ in air with an exposure time 2 minutes

29. This is considered to be a stunning method but there is no evidence that birds will lose consciousness after only a two minute exposure, nor that the mixture is not irritant and aversive to birds. However, it has

to be noted that this gas mixture containing 30%CO₂ may be just as aversive as the 30%CO₂ in Argon, but it may take too long a time to stun birds and so be impractical in a commercial setting. Consequently, in the absence of this further evidence this method would not be acceptable.

- Method 3: 3 phases 20% CO₂ for 30 seconds, 40% CO₂ for 50 seconds, and 50% CO₂ for 30 seconds (approximate times).

30. Under this system, birds are conveyed through three chambers containing increasing levels of CO₂. This method has apparently been in use in Germany since October 1997 and has been shown to be a stunning method as birds are able to recover after exposure. The lowest starting concentration of CO₂ may not be irritant but will it be sufficient to induce unconsciousness before it goes into the 40% CO₂ which is probably aversive? At the end of the 3 stage exposure, birds appear to be unconsciousness as there is no reaction to neck cutting. No scientific evidence is available on this method but anecdotal evidence suggests it is worth investigating.

- Method 4: 40% CO₂ , 30% O₂, 30% N₂ for 1 minute followed by 80% CO₂, 10% O₂, 10% N₂ for 2 minutes

31. In this method, birds on a conveyer are exposed to the

initial gas mixture for 1 minute to stun them, followed by 80% CO₂ for a further 2 minutes to kill them; birds do not recover if left unbled. This is being used in one commercial slaughter house in Belgium.

32. As mentioned above (paragraph 25) it has been found that times longer than 2 minutes are necessary to induce unconsciousness (as measured by loss of SERs) in 100% of birds exposed to 40% CO₂, even if the majority of birds had lost SERs after two minutes (Raj et al., 1998a and personal communication), as that still leaves 13% of birds with evidence that they may be able to feel pain. On the other hand, birds did show a loss of posture in 42 seconds in that they were unable to maintain sitting position, neck tension and fell on their sides or backs, but the proportion of birds in this state was not stated (Nieuwelaar & Hoen, 1997; Lambooi et al. 1998 and personal communication). Such ataxia has been accepted as a behavioural indicator of the onset of unconsciousness and hence insensibility (Raj et al, 1992; Raj & Gregory, 1994).

33. The next step of exposure to 80% CO₂ to kill the birds, and which is highly irritant, would not be a welfare concern if there was evidence that 100% of birds were unconscious after one minute in the first gas mixture of 40% CO₂. Another concern is that even the initial concentration of 40%

carbon dioxide may be aversive for birds (see paragraph 25). Evidence is also needed on the proportion of the birds that are dead after the second period ie. after the 80% CO₂.

34. It is worth comparing this 40% CO₂ method with the method involving 30% CO₂ with >60% Argon in air, already approved by the Scientific Veterinary Committee. The argon mixture is faster to induce unconsciousness as indicated by loss of posture (in an average of 12 seconds compared with 30 seconds in 40% CO₂), and it abolishes SERs in ALL chickens within an average time of 19 seconds (Raj et al., 1992; Raj et al. 1998a). While both methods irritate birds (head shaking and gasping being signs of irritancy that were observed), the total number of gasps is greater in 40% CO₂ than in the 30% CO₂/Argon mixture.

Furthermore, birds are likely to be conscious for longer periods in 40% CO₂ as on average they take some 15 seconds longer to lose their posture (EU-Air, 1996, Lambooj & Pieterse, 1997).

35. The following points may be concluded. First, there is no evidence that all birds would be unconscious before entering the aversive atmosphere of 80% CO₂. Second, there is evidence that the animals found the concentration of 40% CO₂ quite aversive. However, it is possible that the period in 40% CO₂ might be satisfactory (or even the use

of 30% CO₂) if it were extended, but it has to be noted that such periods of time might cause practical difficulties in the abattoir. Alternatively, argon could be used in the first stage. In the light of evidence for the aversiveness of 40% CO₂ mixtures and the absence of research evidence on other points mentioned above, it is not possible to recommend this method as currently detailed.

- Method 5: 45% CO₂ in air

36. This is a method of killing birds if the duration of exposure is longer than 2 minutes. It has been found that SERs were lost in 8 out of 8 culled layer chickens in an average of 30 seconds after exposure (Raj, Gregory & Wotton, 1990) and killed 72% of birds in 2 minutes (Raj & Gregory, 1990).

37. This would be acceptable for a killing method were it not for the fact that 45% CO₂ is aversive to the birds and, therefore, it cannot be considered suitable from an animal welfare point of view. It may also have practical drawbacks in the slaughterhouse because of the long time periods likely to be needed.

Day old chicks

38. Three methods are reported as satisfactory for killing day old chicks (Raj and Whittington, 1995). These are:

- exposure to >90% Argon in air until they are dead;

- exposure to 30% CO₂ and >60% Argon until they are dead;
or

- >90% CO₂ in air until they are dead.

The Committee feels that the two methods using argon are likely to be superior. In a previous opinion, the Scientific Veterinary Committee recommended maceration as the preferred method for killing day old chicks.

39. Of the five methods under consideration for adult chickens, none has been tested on young chicks but in view of the resilience of very young birds to carbon dioxide (see Jaksch, 1981 - they appear to have adapted to such conditions during incubation) it is unlikely that any of the methods would be suitable for newly hatched chicks.

Other Species of Poultry

- Turkeys

40. Published information does not exist for methods 1 to 4 for this species, though research is underway on some methods. It has been reported that 50% of turkeys avoided an atmosphere containing 72% CO₂ in air (Raj, 1996a). Therefore, Method 5 needs further investigation to evaluate the effects of 45% CO₂, especially as 30% CO₂ in argon

was tolerated well.

41. Considering the recommended methods in the previous report of the Scientific Veterinary Committee (>90 % argon and 30% CO₂ in argon), and that hypoxia due to replacing oxygen by argon does not lead to pain or distress in chickens, a prolonged exposure time required to stun or kill turkeys seems acceptable from the animal welfare point of view. The reported results of Raj and Gregory (1994) as well as Raj (1996a) point in this direction but more work is needed.

- Quail

42. Research is needed in this area. Little is known about the performance of any of the methods under consideration in this species. Two methods which were considered in the earlier report of the Scientific Veterinary Committee have since been investigated in this species: 60% argon and 30% CO₂ in air, and >90% argon in air. Both methods killed quails following a two minutes exposure and are considered to be acceptable from a welfare point of view (Tserveni-Gousi, et al, 1998).

- Ducks

43. Ducks, probably because of their aquatic evolution, possess a cardiovascular mechanism which acts to protect the heart and the brain against raised CO₂ levels. A further difficulty for gas

stunning methods is that a raised CO₂ level will cause ducks to go into apnoea. Because of these mechanisms, it can take a very long time to kill ducks with CO₂: viz Raj (1996b) found that ducks survived for 7 minutes in 50% CO₂ in air, and in view of the concentration of CO₂, the mixture could well be aversive.

44. It is unlikely that any of the Methods 1 to 5 would be acceptable on humanitarian grounds for ducks. However, there is evidence that Argon alone or Argon/CO₂ mixtures may be used satisfactorily for domestic ducks (Raj et al., 1998b).

- Geese

45. We found no published information on gas stunning or killing of geese.

- Pheasants, Partridge, Guinea Fowl, Pigeons

46. Published information is not available on gas stunning or killing of these birds. However, because they will attempt to fly, it would be important from a welfare point of view for them to be kept in crates during any gas stunning or gas killing procedure.

- Ratites

47. Published information is not available on gas stunning or killing of these birds. However, it should be noted that because of their size, there are likely to be

practical problems with the use of gas for stunning and so such methods cannot be recommended.

Research Needs

48. From the scientific evidence available, it would appear that argon has fewer adverse effects than methods involving CO₂. It may therefore be more profitable to concentrate on improving the research methods that are based on argon in all species. Nevertheless it is recognised that refinement of CO₂ methodology may still produce useful commercial outcomes.

49. None of the newly proposed methods (Methods 1 to 5) has been sufficiently researched on the relevant aspects of animal welfare, carcass quality, meat quality and workers' safety to enable any firm recommendations. From an animal welfare point of view, published scientific data available at present suggests that killing of poultry species, rather than stunning them with gas mixtures, might be preferred or might even be essential to prevent premature recovery. Nevertheless, research is needed into what gas mixtures should be considered for stunning poultry species for commercial reasons. These problems are likely to be further confounded by species to species variation in terms of susceptibility or resistance, the degree to which they are found

to be aversive, and the time it takes to render birds unconscious and insensible, any of which may render a gas mixture unacceptable.

50. Another aspect that needs to be investigated is whether, during carbon dioxide stunning, the observed reactions indicating stress such as head shaking (Zeller et al., 1988; Hoenderken et al., 1994; Erhardt et al., 1996; Raj, 1996a), gasping for air (Raj & Gregory, 1994), yawning (Erhardt et al., 1996), vocalisation (Zeller et al., 1988), sneezing (Hoenderken et al., 1994), and defecating (Zeller et al., 1988) are genuine causes for concern.

51. Convulsions (marked wing flapping) have been reported to occur to a greater or lesser degree with most methods but appear to be less severe with gas combinations that incorporate oxygen (Woolley and Gentle, 1988; Raj et al., 1991; Hoenderken et al., 1994). However, they also occur in animals that are unconscious during anoxia (Dell et al., 1961; Ernstring, 1965; Raj et al., 1991). Consequently, it is necessary to have reassurance of a clear point at which birds are unaware of any convulsion that might occur.

Summary and Conclusions

52. The inevitable stress of uncrating and shackling conscious birds under the conventional electrical water bath

stunning systems is a welfare concern and the use of gas mixtures for stunning or killing birds can eliminate these stresses.

53. In order to approve a gas method for stunning or killing poultry in slaughterhouses the following information, based on sound scientific evidence is likely to be required for each gas mixture and for each species.

- The aversiveness of the method eg. through observations of behaviour, hormonal disturbances.

- The exposure times required to stun or kill effectively, based on evidence of unconsciousness or death.

- The appropriate neck cutting intervals which will avoid recovery of consciousness either before neck cutting or during bleeding.

- The effects on carcass and meat quality so that the gas mixtures are acceptable to the industry.

- The effects on workers' safety.

- The practicability of the method.

54. Methods using >90% Argon appear best from a welfare point of view

55. Whenever concentrations of CO₂ sufficient to stun or to kill birds have been used, there has

been evidence of irritation. Low concentrations which may not be irritant may not be sufficient to cause loss of consciousness and insensibility in a time that is practicable.

56. There are a number of important physiological differences between poultry species. Therefore gas mixtures may have to be tailored for each species. Firm recommendations cannot be made at present for the different gas mixtures in the different poultry species, because insufficient research has been performed on either welfare alone, or welfare combined with meat quality aspects.

57. However, a modified version of the 2 step Method 4 exposure to 40% CO₂, 30% O₂, 30% N₂ followed by 80% CO₂ in air looks promising for broilers and could be recommended if exposure to an appropriate mixture is sufficient to render 100% of the birds unconscious before entering the 80% CO₂ mixture. It also needs to be shown that the combination of 40% CO₂ and other gases is not unduly aversive and does not cause irritation to the birds. Method 4 may be acceptable if the gas mixtures or times are changed but further research is needed before this method can be recommended. Method 3, exposure to increasing concentrations of CO₂, could be acceptable but again further research is needed before this

method can be accepted as humane.

58. The Committee recommends that only >60% Argon and 30% CO₂ in air and >90% Argon in air be accepted as humane methods for killing ducks and quails at the present time.

References

- Dell, P., Hugelin, A., & Bonvallet, M. (1961) Effects of hypoxia on the reticular and cortical diffuse systems. In: Cerebral Anoxia and the Electroencephalogram, Eds: H. Gastaut & J.S. Meyer pp 46, Publr: Charles C. Tomas Springfield, IL, USA.

- Ernstring, J. (1965) The effect of anoxia on the central nervous system. In: A text book of Aviation Physiology. Ed : J.A. Gilles pp 270 -289. Publr: Pergamon Press, London.

- Erhardt, W., H. Gehra, M. Schaefer, T. Brill and J. Henke (1996) CO₂-Betaeubung zur Schlachtung von Puten. Deutsche tieraerztliche Wochenschrift 103, 62-64.

- EU-AIR Project CT 94-0885. (1996) Periodic Scientific Progress Report (October 1995 - October 1996) Development of new humane stunning and related methods for poultry to improve product quality and consumer acceptability. (1996).

- Hoenderken, R.B., Lambooy,

B., van den Bogaard, A.E.J.M.
and Hillebrand, S.J.W. (1994)
Tierschutzgerechte
Gasbetäubung von Geflügel.
Fleischwirtschaft 74, 497-500.

- Jaksch, W. (1981) Euthanasia
of day-old male chicks in the
poultry industry. International
Journal for the study of animal
problems 2(4), 203-213.

- Lambooij, E. (1997) Proc.
Satellite Symposium: Alternative
stunning methods for poultry. Ed.
E. Lambooij. ID-DLO Rapport nr:
97.037, Held in Lelystad, 25
September 1997. Publr. Inst.
Animal Science & Health.
Edelhertweg 15, POBox 65, NL-
8200 AB Lelystad.

- Lambooij, E. & Pieterse, C.
(1997) Alternative stunning
methods for poultry. pp 7 - 14.
Proc. Satellite Symposium:
Alternative stunning methods for
poultry. Ed. E. Lambooij. ID-DLO
Rapport nr: 97.037, Held in
Lelystad, 25 September 1997.
Publr. Inst. Animal Science &
Health. Edelhertweg 15, POBox
65, NL-8200 AB Lelystad.

- Lambooij, E. , Gerritzen, M.A.,
Engel, B., Hillebrand, S.J.W.,
Lankhaar, J., & Pieterse, C.
(1998) Behavioural responses
during exposure of broiler
chickens to different gas
mixtures. Submitted. Applied
Animal Behavioural Science.

- Nieuwelaar, J. & Hoen, T.
(1997) Influence of controlled
atmosphere stunning of broilers

followed by maturation chilling on the meat quality of the carcass. pp 35 - 40. Proc. Satellite Symposium: Alternative stunning methods for poultry. Ed. E. Lambooij. ID-DLO Rapport nr: 97.037, Held in Lelystad, 25 September 1997. Publr. Inst. Animal Science & Health. Edelhertweg 15, POBox 65, NL-8200 AB Lelystad.

- Poole, G.H. & D. L. Fletcher (1995) A comparison of argon, carbon dioxide and nitrogen in a broiler killing system. Poultry Science 74, 1218-1223.

- Raj, A. B. M. (1996a) Aversive reactions of turkeys to argon, carbon dioxide and a mixture of carbon dioxide and argon. The Veterinary Record, 138, 592-593.

- Raj, A. B. M. (1996b) A research report on the feasibility of stunning / killing Pekin ducks with gas mixtures. A report submitted to the Ministry of Agriculture, Fisheries and Food (MAFF), UK.

- Raj, A. B. M. & Gregory, N. G. (1990) Investigation into the batch stunning/killing of chickens using carbon dioxide or argon-induced hypoxia. Research in Veterinary Science, 49, 364-366.

- Raj, A.B.M. & Gregory, N.G. (1994) An evaluation of humane gas stunning method for turkeys. The Veterinary Record 135, 222-223.

- Raj, A. B. M. & Whittington, P.

E. (1995) Euthanasia of day-old chicks with carbon dioxide and argon. *The Veterinary Record*, 136, 292-294.

- Raj, A. B. M., Gregory, N. G. & Wotton, S. B. (1990) Effect of carbon dioxide stunning on somatosensory evoked potentials in hens. *Research in Veterinary Science*, 49, 355-359.

- Raj, A. B. M., Gregory, N. G. & Wotton, S. B. (1991) Changes in the somatosensory evoked potentials and spontaneous electroencephalogram of hens during stunning in argon-induced anoxia. *British Veterinary Journal* 147, 322 - 330.

- Raj, A. B. M., Wotton, S. B. & N. G. Gregory (1992) Changes in the somatosensory evoked potentials and spontaneous electroencephalogram of hens during stunning with carbon dioxide and argon mixture. *British Veterinary Journal* 148, 147 - 156.

- Raj, A. B. M., Richardson, R. I., Wilkins, L. J. & Wotton, S. B. (1998a) Carcase and meat quality in ducks killed with either gas mixtures or an electric current under commercial processing conditions. *British Poultry Science*, to be published in July issue.

- Raj, A. B. M., Wotton, S. B., McKinstry, J. L., Hillebrand, S. J. W. & Pieterse, C. (1998b) Changes in the somatosensory evoked potentials and

spontaneous
electroencephalogram of broiler
chickens during exposure to gas
mixtures. In Press. British Poultry
Science.

- Schaefer, M. (1995) Zur CO₂-
Betaeubung von Puten vor der
Schlachtung. Verhaltensstudien
zur Tierschutzrelevanz.
Veterinary Thesis, Ludwig-
Maximilians-Universitaet,
Muenchen.

- Tserverni-Gousi, A. S., Raj, A.
B. M. & O'Callaghan, M. (1998)
An evaluation of stunning / killing
methods for quails (*Coturnix
coturnix japonica*) : Bird welfare
and carcass quality. Submitted
for publication in British Poultry
Science.

- Uijtenboogaart, T.G. (1997)
Effects of gas and electrical
stunning methods on meat
quality. pp. 25 -33. Proc. Satellite
Symposium: Alternative stunning
methods for poultry. Ed. E.
Lambooj. ID-DLO Rapport nr:
97.037, Held in Lelystad, 25
September 1997. Publr. Inst.
Animal Science & Health.
Edelhertweg 15, POBox 65, NL-
8200 AB Lelystad.

- Woolley, S.C. and M.J. Gentle
(1988): Physiological and
behavioural responses of the
domestic hen to hypoxia.
Research in Veterinary Science,
45, 377-382.

- Zeller, W., D. Mettler and U.
Schatzmann (1988)
Untersuchungen zur Betaeubung

des Schlachtgefluegels mit Kohlendioxid. Fleischwirtschaft 68, 1308-1312.

Acknowledgements

This report of the Scientific Committee on Animal Health and Animal Welfare is substantially based on the work of a working group of the Committee.

The working group was chaired by Prof. D. Morton. The members of the group are listed below.

Dr. Barton-Gade, Dr. X. Fernandez, Dr. B Lambooj, Prof. D. Morton (Chairman and rapporteur), Dr. M. Raj, Dr. Troeger,



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- Joint Declaration -

Date: February 22nd, 2014

The Slaughter of animals by mechanical means, (including sacred blade) is not permissible and considered haram (forbidden) for Muslims.

A Halal Conference was held at Hijaz College, Nuneaton, UK on February 22nd, 2014. Religious scholars from different schools of fiqh and Halal industry experts were present at the conference. Halal Authority Board (HAB) proposed to get a declaration signed off by all attendees stating that, *"The slaughter of animals by mechanical means, (including sacred blade) is not permissible and considered haram (forbidden) for Muslims. Only hand slaughter undertaken by Muslim Slaughtermen is acceptable and considered as Halal."*

Mohamamd Amir, Technical Director of Halal Assure-IP (HAIP), Assure-IP (UK), supported the declaration that Machine Slaughter is haram but raised a valid objection that the second part of declaration was incomplete and misleading. According to Mr Amir the declaration does not give information on whether or not the birds are water bath stunned prior to hand slaughter by Muslim slaughter men. He explained to the attendees the consequences of water bath stunning and how it affects Halal integrity and they agreed with him.

Mr Amir proposed that since the use of water bath stunning for Halal slaughter is controversial and requires further research the declaration should be amended and the amended declaration should be, ***"The slaughter of animal by mechanical means, (including sacred blade) is not permissible and considered haram (forbidden) for Muslims." All attendees approved and signed off the joint declaration.***

Mr Amir has also proposed a declaration for food business operators, Halal certifiers as well as the manufacturers of water bath stunning equipment, that if they wish to claim water bath stunned poultry as Halal and complying with Islamic Dietary Law, they would need to sign on this declaration (declaration attached).

Religious Minister of Craven Arms Islamic Centre, Imam Sohaib Peerbhai said, during the conference, ***"The Muslim community is united on the issue of Mechanical Slaughter being unislamic. Hopefully we can now work on other pressing issues."***



Note: Halal Assure-IP (HAIP) does not accept stunning by any means. This declaration is design for those business and certifiers who claim that water bath stunned poultry is Halal.
Email: info@halalassure-ip.co.uk | Web: www.halalassure-ip.co.uk |

- Halal Declaration Required for Water Bath Stunning -

I have assessed the stunning system at _____
_____ < Abattoir Name & Address >.

Water bath system manufacturer / model / software detail and description:

Number or birds per minute: _____, Voltage (V): _____ (min) _____ (max),
Current (Amps): _____, Dwell time: _____, Frequency: _____,

System operation (brief description): _____

I have read and understood the above described water bath stunning system. I declare that it will not kill (0% death) or cause permanent injury to the birds' body (dislocated bones, fractured bones, cardiac arrest, blood splash, internal ruptured blood vessels and haemorrhages) before slaughter.

I declare that the above stated is correct and take judicial responsibility for any discrepancies.

This declaration must be signed by four professionals:

**1. Witness- Veterinary Surgeon / FSA or MHS
(must be MRCVS, expert in poultry and
stunning system)**

- a. Name & Signature:
- b. Contact Detail:
- c. Organisation / Institution:
- d. Date:

**2. Witness- Water Bath Stunning
Manufacturer (Director or same grade)**

- a. Name & Signature:
- b. Contact Detail:
- c. Organisation / Institution:

d. Date:

3. Witness- Abattoir Owner

- a. Name & Signature:
- b. Contact Detail:
- c. Organisation / Institution:
- d. Date:

4. Witness- Halal Certifier (Director/Trustee)

- a. Name & Signature:
- b. Contact Detail:
- c. Organisation / Institution:
- d. Date:

For further information please contact:
Mohammad Amir | MSc Meat Sci & Tech | MSc Food Tech |
CEO/Technical Director
Email: amir@halalassure-ip.co.uk