

Reports and Comments

Electrical requirements for water-bath stunning of poultry

Although controlled-atmosphere systems are being increasingly used to induce unconsciousness in the slaughter of poultry, electrical water-bath systems are still widely used throughout the world to stun birds prior to slaughter. These involve suspension of the birds by their legs on a moving shackle line that conveys them to a water-bath into which their heads are immersed. The birds complete an electrical circuit between the water-bath and the shackle line, and the principle is that the current flow induces immediate loss of consciousness before they are bled, and such that they do not recover before death due to blood loss. These systems may be set so as to cause cardiac arrest also. The efficacy of these systems depends on the strength of the current, whether it is AC or DC, and the shape and frequency of the electrical waveform. Problems arise because the ideal parameters of the current for stunning may not be the ideal parameters from the meat quality point of view and also because the current that flows through each bird depends on how much flows through the other birds in the water-bath at the same time. Resistance varies between birds according to the quality of the contact their legs make with the shackles and many other factors.

There has been considerable research into electrical stunning of poultry but it has not been on such a scale as to provide a comprehensive description, or to allow robust predictions, about the efficacy of all the possible combinations of electrical variables (current, waveform, frequency and whether AC or DC) in inducing unconsciousness. There are gaps in knowledge in this field and a further problem is that it is possible that, in some circumstances, birds showing signs of being effectively stunned may not have been. Electro-encephalography (EEG) is the most reliable method for assessing unconsciousness but it cannot be applied in commercial practice.

The UK and Dutch Governments asked the European Commission (EC) to review regulations about electrical parameters. For example, the UK Government was concerned that high frequency currents (> 800 Hz) might cause immobilisation without unconsciousness and the Dutch Government was concerned that the regulations specify average water-bath currents instead of the minimum currents that must be delivered to each bird. The Animal Health and Welfare Panel of the European Food Standards Agency (EFSA) was therefore asked by the EC to review and make recommendations about the water-bath stunning of poultry.

The Panel's report was published in July 2012. It included 21 conclusions, the last of which were: "When water-bath stunning is used it is not possible to ensure that all birds are stunned" and "It may not be practical at the present time to measure EEG routinely in the abattoir. However, laboratory studies do show that current flow through individual birds at a specified frequency can be used with confidence to predict the EEG. Thus, the effectiveness of the stun can be assessed under abattoir conditions from accurate measurement of current flow through individual birds".

Recommendations regarding policy and further research which follow from the conclusions of this EFSA review include that the EC regulation should specify minimum current for each bird and also the current type and the frequency and shape of the waveform, and that there should be further research into the correlation of EEG and practical measures of unconsciousness and insensibility. The final conclusion of the report is that: "Unless the problems described in this opinion for all existing water-bath stunning methods can be resolved, other stunning methods should be used". There will be costs involved in addressing these matters and it seems reasonable that these should be met by the consumers for whom the poultry is produced.

Scientific Opinion on the Electrical Requirements for Water-Bath Stunning Equipment Applicable for Poultry (July 2012). A4, 80 pages. EFSA Panel on Animal Health and Welfare (AHAW). *EFSA Journal* (2012); 10(6): 2757. doi: 10.2903/j.efsa.2012.2757. Available online at: <http://www.efsa.europa.eu/en/efsajournal/pub/2757.htm>.

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OIE international standards for stunning and killing of farmed fish for human consumption, 15th Edition, 2012

These standards, which form part of the OIE's (World Organisation for Animal Health) recently updated Aquatic Animal Health Code, provide recommendations for the humane treatment of farmed fish at the time of stunning and killing. The recommendations are subdivided into: personnel; holding facilities; the unloading, transfer and loading of fish; and methods of stunning and killing. A summary table of the welfare issues associated with different stunning and killing methods is also provided.

The standards promote two overriding principles — that fish should be stunned before killing, and that equipment, parameters and methods used should be appropriate to the species of fish being stunned and killed.

The stunning and killing methods discussed are divided into mechanical (being percussion, spiking, coring and shooting) and electrical methods. Methods involving chilling, carbon dioxide narcosis, salt or ammonia baths, asphyxiation and exsanguination without stunning are deemed to result in poor welfare and are recommended against if mechanical or electrical methods are feasible.

These standards provide a sound basis upon which to build national or regional legislation. It may not be within the remit of these guidelines to provide specific recommendations (in the form of facts and figures) and, indeed, such detail is not included. However, this could be seen as a missed opportunity. Future revision of these standards could introduce more specific guidance; for example, maximum times for crowding, fasting and holding fish out of water.

Some of the recommendations also require clarification and consideration of their practicality. It is said that stunning should be verified by the lack of consciousness — is this for a sample of the harvest or for each individual fish? Although the ideal, the latter would be difficult to achieve when stunning and killing on a large scale, as may the requirement to re-stun any fish showing signs of regaining consciousness.

Another potential oversight is found where the recommendations state that fish should be killed following the use of potentially reversible percussive or electrical stunning: methods for achieving this are not provided.

Notwithstanding the lack of specific detail, the wholehearted adoption of the general principles included in these recommendations by the 178 member countries would greatly improve the welfare of farmed fish at stunning and killing around the world.

Welfare Aspects of Stunning and Killing of Farmed Fish for Human Consumption (2012). A4. Aquatic Animal Health Code, 15th Edition, 2012, Chapter 7.3. Available at: www.oie.int/en/international-standard-setting/aquatic-code/access-online/.

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A model for assessing animal welfare in pest control

Innumerable animals are killed or otherwise controlled as ‘pests’ around the world every year. In most cases, the animal welfare impacts of this control have been unknown. Where animal welfare has been considered, there has not been a consistent approach applied. This is despite a desire amongst practitioners and others to see animal welfare concerns addressed.

Driven by the consideration of this issue under the Australian Animal Welfare Strategy, a model for assessing animal welfare impacts in pest control has been developed with input from scientists, regulators and animal welfare, veterinary, pest animal control and livestock sector organisations. The model was first published in 2008. Since then, it has been used to assess the major pest control methods in both New Zealand (Fisher *et al* 2010) and Australia. This second edition brings together the Australian assessment and the model, revised in light of the assessment process.

The model lays out a two-stage scheme for assessing the animal welfare impacts of methods used to kill or manage animal pests. Part A examines the impact of a method on overall welfare and duration of this impact. Part B examines the intensity and duration of pain or distress caused by the killing technique (if applicable). The model takes account of impacts on the target animal only (the individual affected pest) and assumes best practice application of the method.

The assessment of a selection of pest control methods using the model was conducted by an expert panel using information from the scientific literature. The outcome is presented in a series of worksheets and figures showing method scores, with supporting evidence.

The model is intended to provide information for practitioners and regulators on the animal welfare impacts of methods, to encourage the use of more humane methods. It is also intended to highlight where more humane methods should be developed.

A Model for Assessing the Relative Humaneness of Pest Animal Control Methods, Second Edition (2011). Written by Sharp T and Saunders G, Australian Government Department of Agriculture, Fisheries and Forestry, Canberra, ACT. Available online and for download at: <http://www.daff.gov.au/animal-plant-health/welfare/aaws/humaneness-of-pest-animal-control-methods>. The full set of assessments is available at <http://www.feral.org.au/animal-welfare/humaneness-assessment/>.

References

Fisher P, Warburton B, Beausoleil N and Mellor DJ 2010 *How humane are our pest control tools? (09-11326)*. MAF Biosecurity New Zealand Technical Paper No 2011/01. Ministry of Agriculture and Forestry: New Zealand. Available online: <http://www.biosecurity.govt.nz/about-us/our-publications/technical-papers#how-humane-are-our-pest-control-tools>.

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The use of animal-based measures to assess the welfare of broilers

The Animal Health and Welfare (AHAW) Panel of the European Food Standards Agency (EFSA) has recently published a Scientific Opinion which lays out an independent view on the use of animal-based measures to assess the welfare of meat chickens. The report is divided into three main sections. The first outlines the background work that was undertaken for the Opinion, the second discusses the terms of reference given to EFSA by the European Commission, and the third considers how welfare assessment may be further developed when taking into account factors that affect animal welfare, measures used to assess it, and the links between them.

Animal-based measures seek to evaluate the welfare status of an animal directly and to encompass any impact that environmental and management factors may have. Essential attributes of animal-based measures are discussed within the report, such as validity (the accuracy of a measurement to correctly identify a specific welfare consequence, ie sensitivity and specificity) and robustness (the repeatability and reliability of an animal-based measure).

EFSA provides an array of possible animal-based measures that may be used to assess broiler welfare and the strongest animal-based measures on-farm are considered to be: panting, dehydration, lameness, culls on-farm, on-farm mortality, plumage cleanliness, and emaciation. When assessing welfare at the slaughterhouse during meat inspection, the prevalences of the following are considered to be appropriate: foot-pad dermatitis, hock burn, breast burns, breast blisters, emaciation, ascites, and dehydration.

It is not expected that all measures will be used in all situations; the intention is that the list of measures should act as a ‘toolbox’. EFSA states that the measures selected