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.

https://doi.org/10.1017/S0962728600004231 Published online by Cambridge University Press