

Improving the welfare of poultry during stunning and slaughter

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Introduction

Recently, methods of stunning and slaughtering broiler chickens have come under close scrutiny by the community (Fletcher, 1999). In line with this trend, considerable research has been devoted to finding the methods that are in the best interests of the broilers. However, several intervening factors limit the extent to which industry incorporates these changes. This paper will look at possible adjustments to current stunning methods that will improve the welfare of broiler chickens and the issues that may prevent their employment.

Discussion

The electrical water-bath technique is the most commonly used stunning method in commercial poultry production (Raj, 2006). However, for many years there has been a lack of clarity in defining appropriate electrical variables such as frequency, wave forms and current levels (Bilgili, 1999). Inappropriately stunned birds may be able to perceive pain, stress and discomfort and may regain consciousness prior to slaughter (Bilgili, 1999; Fletcher, 1999). These unwelcome possibilities illustrate the importance of standardising these industry variables in a way that will minimise unnecessary distress in broilers. Raj *et al.*, (2006) have helped this process by evaluating how the amount and frequency of pulsed direct current (DC) affect the effectiveness of water-bath stunning. Their study involved recording the electroencephalograms (EEGs) of 96 broilers that were stunned individually using three different current levels and three different frequencies. The key outcome was to measure the effectiveness of the stun in inducing epilepsy.

Results of this study indicate that a delivery frequency of 200 Hz pulsed DC and an average current of 200 mA or above were most effective in stunning. That said, this paper demonstrates how a change involving minimal modifications to infrastructure could improve the welfare of broilers. However, Gregory & Wilkins (1989) found that increased currents result in reduced carcass quality. In industry, where cost and price are the key drivers, this shortcoming may limit implementation of the latest recommendations.

Despite the popularity of the electrical stunning method, the handling associated with the technique creates a considerable amount of stress and pain in chickens (Raj, 1998). Conscious birds must undergo uncrating and shackling prior to stunning (Raj, 1998). Since gas stunning may be performed while birds are still in their transport containers, this method has been suggested as a more welfare-friendly option (Raj, 2006). McKeegan *et al.*, (2006) performed a study to compare the immediate aversiveness of the different gas mixtures used in stunning. The behaviour of 90 chickens was monitored in response to exposure to CO₂ in air, CO₂ in nitrogen, and argon and nitrogen, during feeding.

Results indicated that chickens were most likely to withdraw from feed when CO₂ was above 40%. While the study could not differentiate between aversiveness to a novel stimulus and aversiveness to a nociceptive agent, supporting evidence confirms that CO₂ is nociceptive at high levels (Raj, 1998). The study also found that the anoxia associated with stimulation with inert gases could lead to ataxia. So, it appears that, as long as CO₂ concentrations remain low and oxygen is included in the gas mixture, gas stunning is more welfare-friendly than electrical stunning. Of course, the new infrastructure required to convert electrical stunning systems to gas stunning systems would come at considerable expense. Since industry will respond to market demand for cheap products before it responds to societal pressures for protection of animal welfare, gas stunning will probably prevail only when current electrical stunning equipment becomes inefficient and out-dated.

Economic feasibility is not the only factor that may affect animal welfare. Religious justifications may affect the ability to implement the most welfare-friendly methods. The kosher slaughter of broilers is an example in which scientific advancements and research may not necessarily change animal-handling practices. Barnett *et al.* (2007) evaluated the extent to which Schechita (kosher) slaughter of poultry affected the welfare of broiler chickens by examining the behaviour and response of 692

broilers to slaughter. Schechita slaughter prohibits the use of stunning before severance of vessels in the neck. Results indicated that the time taken for Schechita-slaughtered birds to lose consciousness was, on average, between 12 and 15 seconds. Given that Schechita slaughter does not prevent broilers from feeling fear, distress and pain for these 12 seconds, it may be less humane than conventional systems. Unfortunately, birds were not observed for clinical signs such as ataxia or respiratory difficulties. These indicators may have helped clarify the extent to which the welfare of these birds was compromised during this period. Nevertheless, the study emphasises that it is not only issues of economy that prevent use of the most welfare-friendly systems in industry.

Conclusion

These three papers illustrate that improving the welfare of animals in industry is not simply limited by scientific knowledge. Translating recommendations from researchers into real-life changes requires economic viability and market support. One can infer from the study by McKeegan *et al.* (2006) that some changes are too expensive to introduce in the near future, despite their significant benefits for animal welfare. At the same time, even relatively small changes, as reported by Raj *et al.* (2006), can be difficult to implement as long as any loss in profit or consumer satisfaction is involved. Finally, Barnett *et al.* (2007) raise the issue of religion as an obstacle to employing the most welfare-friendly methods, but although often the focus of media attention, religion is only one of several limiting factors in this domain.

To sum up, the scientific focus on the welfare of broilers during slaughter should result in better practices in the future. However, since economic reality often dictates the methods used in industry, researchers should work towards developing stunning systems that minimise distress in poultry while maintaining economic viability.

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