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Transcranial magnetic stunning of broilers: a preliminary trial to induce unconsciousness

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Abstract

This study was performed to identify whether non-focal transcranial magnetic stimulation (TMS) with an adapted coil for broilers has the potential for use as a non-invasive stunning method for broilers. Application of the TMS probe resulted in dominance of theta and delta waves and appearance of spikes in the electroencephalogram (EEG) after stimulation. Correlation dimension (CD) analyses of the EEG signals recorded prior to and following the application of TMS suggested that the birds might be unconscious for approximately 15 to 20 s assuming that a reduction in CD to 60% of the baseline value indicates unconsciousness. Other observations included loss of behavioural arousal or muscle tone (muscle flaccidity), and irregular heart rate after TMS. It can be suggested that TMS has the potential to be developed as a stunning method in the future. The technique, evaluated using small number of broilers in this study, requires further improvement and the use of a power supply optimised in future research. Transcranial magnetic stimulation of the brain has potential for application as a non-invasive stunning method for broilers, which could be acceptable to some religious groups opposed to the use of established or conventional stunning methods.

Keywords: *animal welfare, behaviour, brain and heart activity, broilers, single and double coil, transcranial magnetic stunning*