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The effect of electrical head-to-chest stunning on the EEG in sheep

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Abstract

Head-to-body stunning is regarded as 'best practice' stunning for sheep. The benefits are loss of consciousness followed by cardiac arrest, death, prevention of animal movements post stun/kill and improved meat quality. Commercial equipment places electrodes on the head and back, which is known to cause pelt burning, thus reducing the value of the skins. The aim was to demonstrate that passing current at 1.5 A and 50 Hz from the top of the head to the chest in lambs for 3.1 s would result in epilepsy. Electroencephalographic (EEG) and electrocardiographic (ECG) activity was recorded in sheep using non-invasive electrodes. Measurements in this trial were successfully performed on three lambs (live weight 25 to 39 kg) which were anaesthetised and given neuromuscular blockers to inhibit muscle activity. EEG information showed that the head-to-chest stunning produced an epileptic-like episode, which was followed by an isoelectric output. ECG recordings showed that ventricular fibrillation (VF) was induced and coincided with the epileptic brain activity observed. No animals regained brain activity or sinus heart rhythm after applying the stated stunning conditions. As a conclusion, it is postulated that modified stunning equipment passing an electrical current from the top of the head to the sternum in lambs (1.5 A, 50 Hz; 3.1 s) may induce an epileptic seizure and VF.

Keywords: *animal welfare, EEG, electrical stunning, head-to-back, head-to-chest, sheep*