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# Comparison of novel mechanical cervical dislocation and a modified captive bolt for on-farm killing of poultry on behavioural reflex responses and anatomical pathology

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## Abstract

*An alternative emergency method for killing poultry on-farm is required following European legislation changes (EU 1099/2009), which heavily restricts the use of manual cervical dislocation. This study investigated the kill efficacy of two mechanical methods that conform to the new legislation: (i) a novel mechanical cervical dislocation device; and (ii) a modified captive-bolt device (Rabbit Zinger™) and manual cervical dislocation (the control). Killing treatments were applied to broilers and layers at two stages of production (broilers: 2–3 and 5 weeks of age; layers: 12–13 and 58–62 weeks), with a total of 180 birds. Latency to abolition of cranial and behavioural reflexes, as well as post mortem analysis of the physiological damage produced, were used to estimate time to unconsciousness and assess kill efficacy. The novel mechanical cervical dislocation device was reliable and a practical method for killing poultry on-farm (100% kill success), with the majority of cranial reflexes showing no significant differences between interval mean durations across killing methods (eg nictitating membrane [mean = 0.7–3.3 s], and rhythmic breathing [mean = 0.0–0.3 s]), however for jaw tone and pupillary reflex, the modified Rabbit Zinger™ had significantly shorter interval mean durations compared to the control and mechanical cervical dislocation device (mean differences: jaw tone = ~8 s; pupillary = ~38 s). The novel mechanical cervical dislocation device resulted in consistent anatomical damage to the birds (eg high dislocation of the neck and severing of the spinal cord) compared to the manual method, despite both having 100% success rate, while the modified Rabbit Zinger™ was difficult to operate and resulted in varied anatomical damage. The novel mechanical cervical dislocation device showed promise as a replacement kill method on-farm for poultry.*

**Keywords**: *animal welfare, captive bolt, cervical dislocation, killing, poultry, reflexes*