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Technical contribution: evaluation of the efficacy of a non-penetrating captive bolt to euthanase dairy goat kids up to 30 days of age

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Abstract

The objective of this study was to evaluate the effectiveness of a non-penetrating captive bolt (NPCB) to euthanase previously disbudded Saanen dairy goat kids (*Capra hircus*) up to 30 days of age and 9 kg bodyweight. Goats were euthanased by placing the muzzle of the NPCB behind the poll between the ears with the goat's head bent so its chin was touching its chest. The NPCB was either fired once (Experiment 1; $n = 30$) or twice in quick succession (Experiment 2; $n = 103$). Immediately after application of the NPCB and every 30 s thereafter, signs of sensibility (presence of brainstem reflexes) were assessed together with the presence of cardiac activity, convulsions and rhythmic respiration, until cardiac activity ceased. In Experiment 1, 27 of the 30 goat kids were rendered immediately insensible and remained insensible until cardiac activity ceased; brainstem reflexes (the blink reflex) and rhythmic respiration remained present in three of the animals after application of the NPCB. In Experiment 2, all goat kids were rendered immediately insensible without return to sensibility prior to cessation of cardiac activity and death. In conclusion, applying the NPCB twice in close succession, behind the poll between the ears with the goat's head bent so its chin was touching its chest, reliably caused immediate and sustained insensibility followed by death in Saanen goat kids up to 30 days of age and 9 kg bodyweight.

Keywords: animal welfare, behaviour, euthanasia, goats, insensibility, non-penetrating captive bolt