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Captive-bolt euthanasia of cattle: determination of optimal-shot placement and evaluation of the Cash Special Euthanizer Kit[®] for euthanasia of cattle

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Abstract

Humane euthanasia of cattle represents a challenge to the beef and dairy industries. Penetrating captive bolt, while traditionally considered to be only a stunning method, can be an effective single-step euthanasia method if both the cerebral cortex and brainstem are disrupted. This report describes a preliminary study investigating the likelihood of brainstem disruption for two captive-bolt shot locations. Heads were collected from 15 cattle that died or were euthanised for reason unrelated to the study and were then randomly assigned to one of two shot placement groups. Heads in the first group (n = 7) were shot at the intersection of two lines drawn from the medial canthus to the opposite horn or top of the opposite ear. Heads in the second group (n = 8) were shot at the intersection of two lines drawn for the lateral canthus to the opposite horn or top of the opposite ear. The guns were held perpendicular (as assessed visually) to the plane of the forehead. Shot placement was then assessed using computed tomography and disruption of the brainstem was determined. In the first group, the captive bolt failed to disrupt the brainstem in any of the heads. In the second group, the bolt disrupted the brainstem in 6 of 8 heads. The results suggest that selecting a higher shot location leads more readily to disruption of the brainstem which reduces the risk of regaining sensibility and should therefore improve animal welfare when cattle are euthanised with a penetrating captive bolt.

Keywords: animal welfare, captive bolt, cattle, computed tomography, euthanasia, shot placement