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Analysis of the Cash Euthanizer system in commercial production settings

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The objective of this study was to assess the effectiveness of the Cash Euthanizer captive bolt gun (CBG) for single-step euthanasia. In the first phase of this study, 42 anesthetized pigs from 7 weight classes (2-3kg, 7.5-10 kg, 15-20 kg, 30-40 kg, 100-120 kg, 200-250 kg, > 300 kg) were euthanized using the CE which utilizes four head styles: a non-penetrating, short-length penetrating bolt, standard-length penetrating bolt and extended-length penetrating bolt. Four different power charges were utilized with the coordinating bolt and weight class. The placement of the CBG was based on American Association of Swine Veterinarians guidelines. The CE resulted in single step euthanasia for 38 of the pigs, with a trend for an effect of weight class for the secondary kill step ($P = 0.0951$). All 4 pigs requiring a secondary step were over 200 kg, resulting in only 67% success rate for these top weight classes. Casual observation of the trajectory of the bolt during the TBI scoring suggested that bolt placement may have been the cause of the ineffective single step applications.

In Phase II, 210 pigs representing the 7 weight classes were euthanized with the Cash Euthanizer in a commercial production setting. Stockpersons at the production sites were responsible for the euthanasia of the pigs. 99.3% of the pigs under 120 kgs were effectively euthanized with the Cash Euthanizer. A defective power charge required a second application of the non-penetrating head on a pig within the lowest weight class. For the two weight classes over 200 kg, a second shot was required for 7 of the pigs resulting in only a 77.7% success rate for the top weight classes. Casual observation suggests that stockperson error was associated with failure to euthanize with a single step, due to inadequate restraint or placement on the skull. In conclusion, the CE was found to be an effective and repeatable single-step method of euthanasia for pigs weighing less than 120 kgs. Further research is needed to identify changes in technique or technology for reliable euthanasia of mature sows and boars.

Figure 1: Comparison of the cerebral cortex TBI scores between weight class ($P = 0.0323$). TBI scores of mature sows and boars differing from the scores for farrowing, nursery and grower pigs.

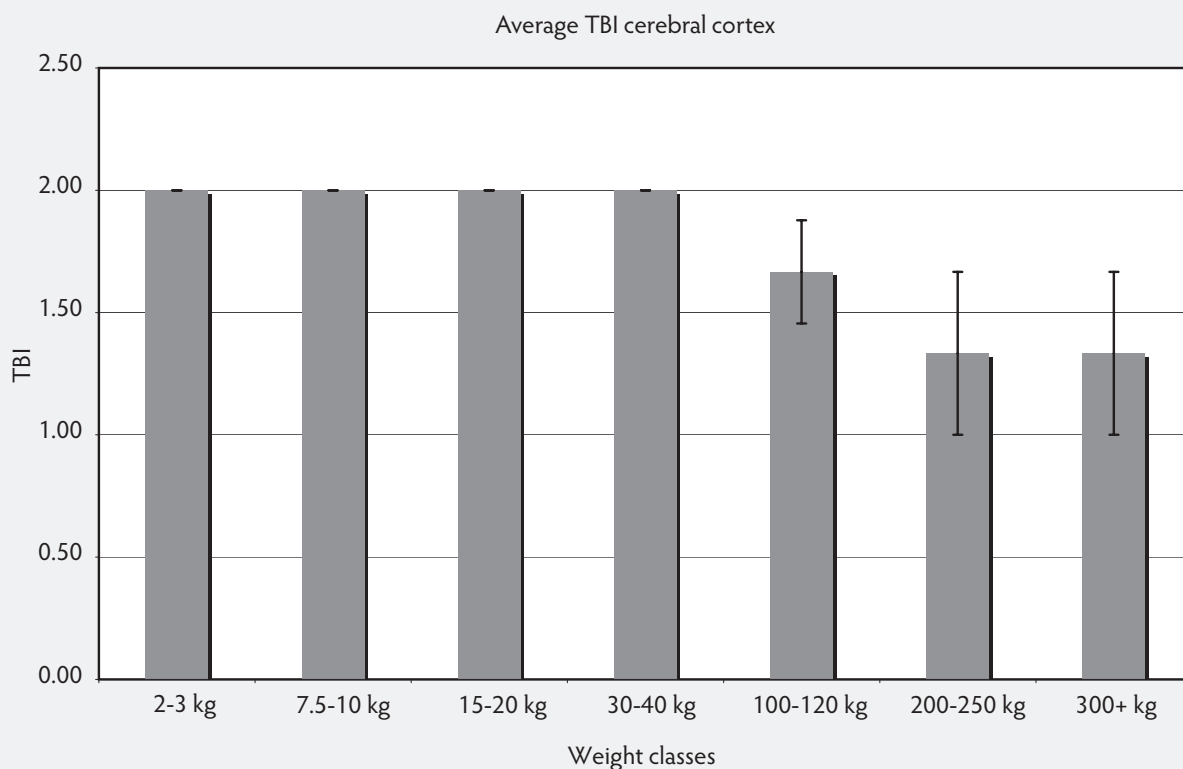


Figure 2: Comparison of thalamus TBI scores by weight class ($P < 0.0001$). Damage was not observed in 3 largest classes.

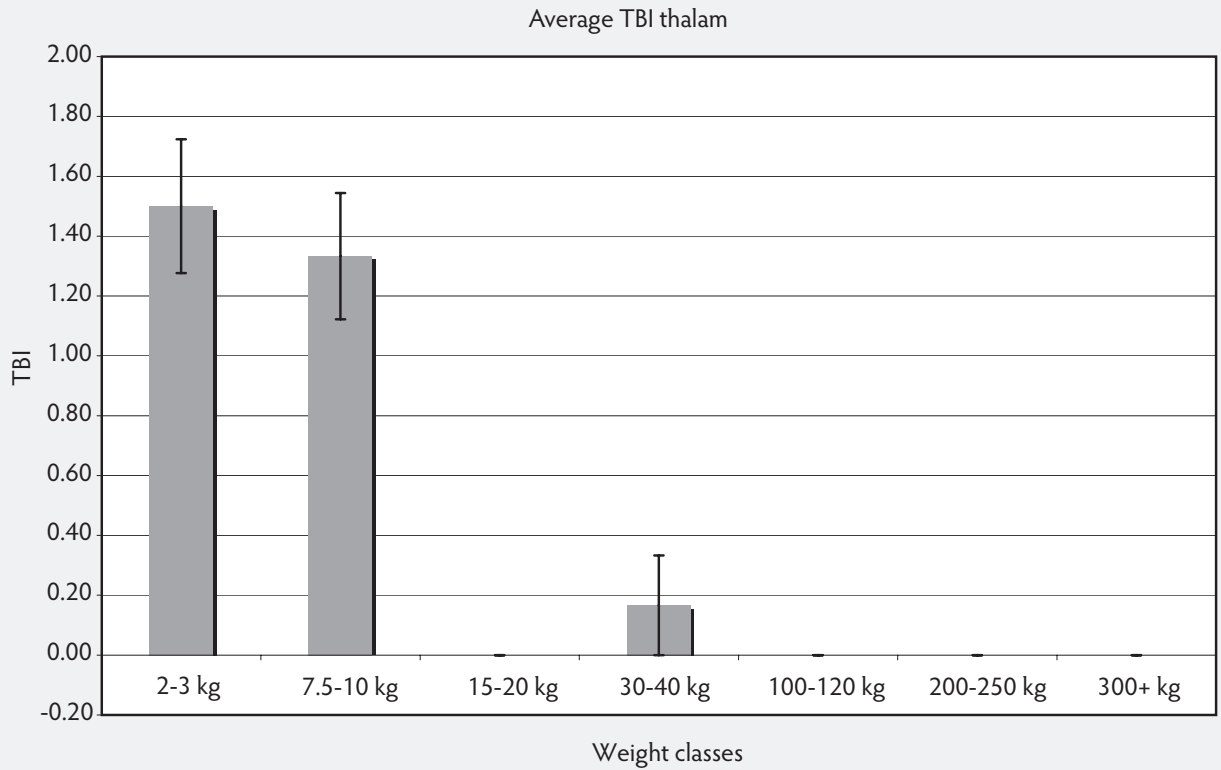
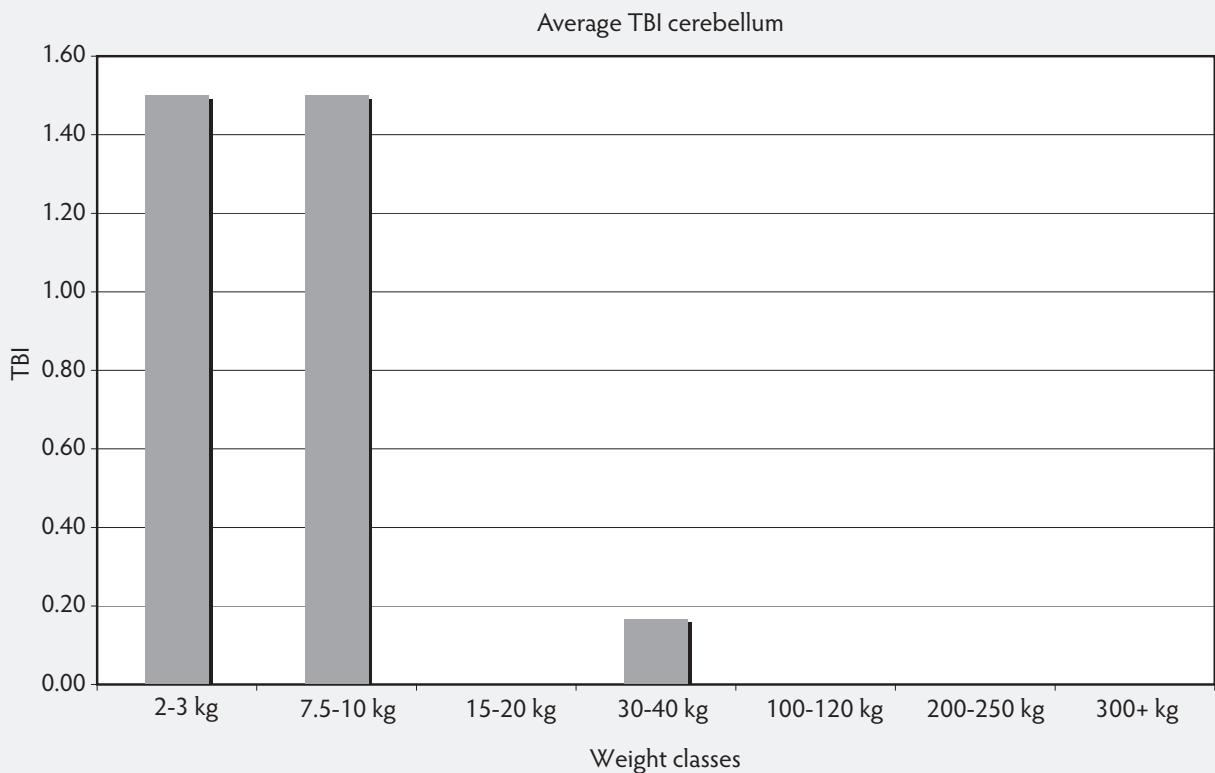


Figure 3: Comparison of the cerebellum TBI scores between weight class ($P < 0.0001$). TBI scores of mature sows and boars differing from the scores for farrowing, nursery and grower pigs.



Interface

Analysis of the Cash Euthanizer system in commercial production settings

Figure 4: Pigs requiring a second shot. The two largest weight classes in Phase II had only a 77.7% success rate for single shot euthanasia.

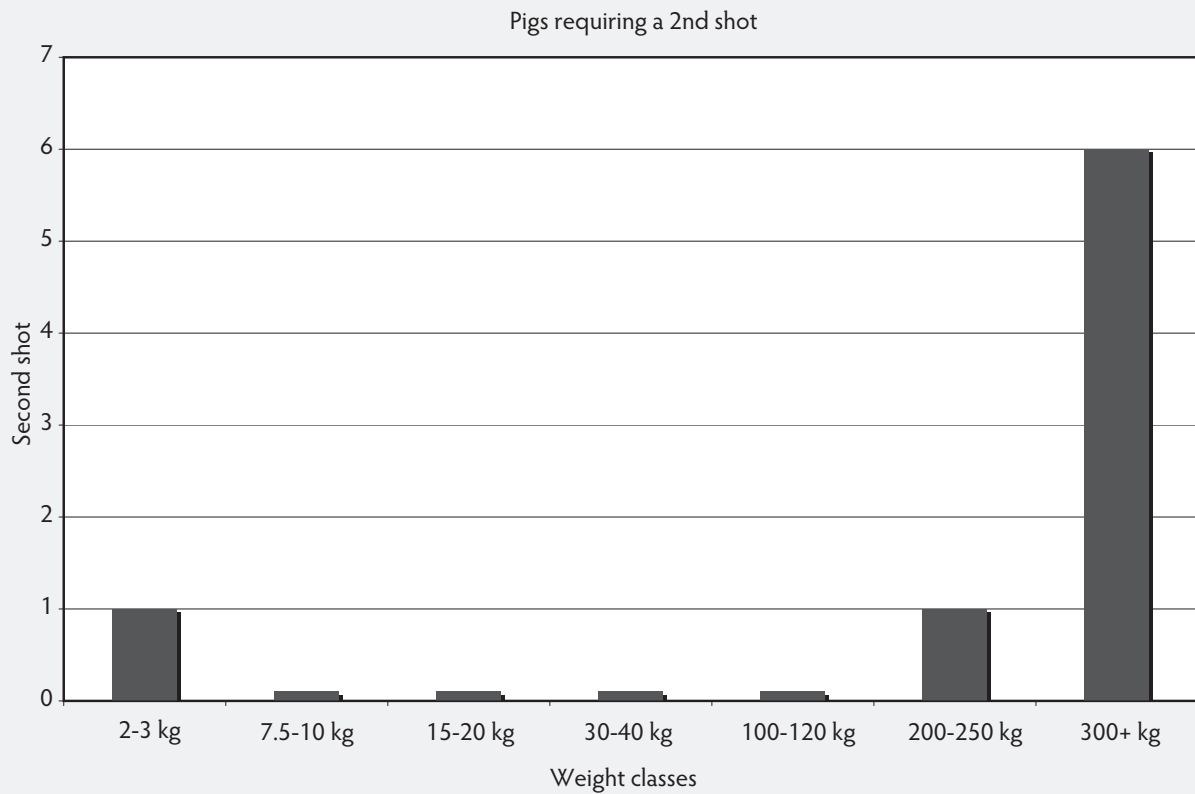


Table 1: Descriptive data for 4 pigs in Phase I requiring secondary step. All four pigs were in the two upper weight classes – 6 & 7. All three face shapes (Unclear U, Plank P, Dish D) were represented in the four pigs. Location of penetration into the brain by the bolt was indicated as frontal (f), occipital (o) or no contact with brain (n). Hole to pole measurement was measured from the hole made by the captive bolt gun to the pole. Traumatic brain injury (TBI) was scored in 5 regions of the brain and damaged was assessed 0 for grossly normal, 1 for some abnormalities and 2 for grossly abnormal/unrecognizable. Hemorrhaging was assessed as yes for present and no for not present.

Ear tag	Weight class	Sex	Face shape	Location of penetration	Hole to poll (cm)	Subdural H(Y/N)	Cerebral cortex	Cerebral cortex Hem	Traumatic brain injury						
									Thalamus TBI	Thalamus Hem	Cerebellum TBI	Cerebellum Hem	Pons TBI	Pons Hem	Medulla TBI
13	6	M	U	f	4.13	N	1	y	0	y	0	y	0	n	0
17	6	M	D	n	3.39	N	0	y	0	y	0	y	0	n	0
16	7	M	U	n	5.26	N	0	y	0	y	0	y	0	y	0
24	7	F	P	f	3.14	Y	2	y	0	y	0	y	0	y	0

