

## ANIMAL WELFARE

**Title:** Identifying best operating procedures for CO<sub>2</sub> gas euthanasia of suckling and nursery age pigs – effects of stocking density - **NPB #12-100**

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**Date Submitted:** 04-29-2014

### Scientific Abstract:

The objective of this study was to evaluate the effects of chamber stocking rate on facets of animal welfare and efficacy during gas euthanasia of young pigs. Crossbred pigs (390 neonatal and 270 weaned in Experiment 1 and 233 weaned pigs in Experiment 2) designated for euthanasia at production farms were randomly assigned to group sizes of one, two, four, or six pigs. Gas euthanasia of each piglet group was performed in a Euthanex® AgPro chamber. For Experiment 1b the chamber air was gradually displaced with CO<sub>2</sub> gas over 5 min to establish an in-chamber concentration of approximately 80% CO<sub>2</sub>. Pigs remained in that atmosphere for an additional dwell period of at least 5 min. Higher stocking rates were associated with higher CO<sub>2</sub> concentrations after gradual fill for both age groups. While there was no evidence of an effect of stocking rate on latencies to loss of posture or last movement in neonatal pigs, there was evidence of an effect on all measured efficacy variables in weaned pigs, with grouped pigs faster to succumb than solitary pigs. This finding is consistent with expected consequences of higher CO<sub>2</sub> concentration at increased stocking densities. Aversive states and behaviours of focal pigs in the chamber were scored from video. Weaned solitary pigs displayed a high incidence of pacing and may have experienced isolation distress. Escape attempts were absent in neonates and were not linearly affected by stocking rate in weaned pigs. Although the risk of hazardous interactions was correlated with group size, this study provided no evidence that isolation during gas euthanasia would benefit animal welfare. For Experiment 2 the chamber was pre-filled with argon gas for 6 min in order to reduce the oxygen concentration to less than 2%. Pigs were then placed into the pre-filled chamber and gas flow was continued at a high rate to displace any introduced air and re-establish a fatally low residual oxygen concentration. Pigs remained in the chamber for 10 min and then were removed to test for signs of sensibility and life. There was no significant evidence of an effect of stocking rate on focal pig latencies to onset of neuromuscular excitation or last movement, as scored from video recordings. Solitary pigs were more likely to pace and make righting attempts in the chamber than paired or grouped focal pigs, although pigs in higher stocking rate treatments tended to retain posture longer. The results of this study do not support seclusion during argon gas euthanasia as a method of improving animal welfare.

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These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

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