

## ANIMAL WELFARE

**Title:** The influence of facility design and pre-sorting on the stress response and transportation losses of the market weight pig – **NPB #08-175.**

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**Date Submitted:** 3<sup>rd</sup> May 2010

**Scientific Abstract**

The objective of this study was to determine the effects of pre-sorting prior to loading and grow-to-finish pen size on stress responses and transport losses in market weight pigs. This study consisted of two separate experiments, both conducted on three commercial grow-to-finish sites in central Iowa. Each site had two rooms and both treatments from each study were represented in each room. Pre-sorting effects were determined in the first experiment and grow-to-finish pen size effects were determined in the second experiment. For the first experiment, thirty-three loads (~180 pigs/load) of market weight pigs (n=5802) were used in a complete randomized block design. The pre-sorted (**PRE**) treatment had 292 pigs/pen ( $0.67 \text{ m}^2 \cdot \text{pig}^{-1}$ ). Internal swing gates were used to manually pre-sort market weight pigs from pen-mates 18 h prior to marketing. The not pre-sorted (**NON**) treatment also had 292 pigs/pen ( $0.67 \text{ m}^2 \cdot \text{pig}^{-1}$ ) but pigs were not pre-sorted from pen mates prior to loading. For the second experiment, twenty-six loads (~174 pigs/load) of pigs (n=4522) were used in a complete randomized block design. The small pen (**SP**) treatment had 36 pigs/pen ( $0.59 \text{ m}^2 \cdot \text{pig}^{-1}$ ). The large pen (**LP**) treatment had 324 pigs/pen ( $0.59 \text{ m}^2 \cdot \text{pig}^{-1}$ ). To achieve large pens, eight consecutive swing gates were kept open. During loading, all swing gates were closed in LP pens. In both experiments, during loading pigs were moved in small groups using sort boards and electric prods if necessary, and loaded on straight deck trailers. Treatments were randomly assigned to a deck, pigs were provided with  $\sim 0.41 \text{ m}^2 \cdot \text{pig}^{-1}$ , and transported  $\sim 1$  h to a commercial harvest facility. During loading and unloading in both trials, the number of pigs displaying open mouth breathing (OMB), skin discoloration (SD) and muscle tremors (MT) were recorded. At the plant, dead and non-ambulatory pigs were recorded during unloading. Total losses were defined as the sum of dead and non-ambulatory pigs. Loading time was analyzed using mixed model procedures. Stress response and transport loss data were analyzed using Proc GLIMMIX of SAS. For experiment one (pre-sorting), dead pigs on arrival (DOA) at the harvest facility could not be run and will be presented descriptively. For experiment two, (pen size) MT at loading, injured and DOA at the harvest facility could not be run and will be presented descriptively. In experiment one, loading time differed ( $P < 0.01$ ) between treatments with NON taking longer to load compared to PRE. In experiment two, loading time differed ( $P = 0.0047$ ) between treatments with LP taking longer to load compared to SP. Lower ( $P < 0.0001$ ) OMB and SD were observed at loading for PRE compared to NON pigs, but there were no differences between PRE and NON for MT or non-ambulatory at loading or for stress responses at unloading. The incidence of DOA was 0.07% PRE and 0% NON. No differences existed between PRE and NON for fatigued, injured, total non-ambulatory or total losses (NON= $0.27 \pm 0.09$ , PRE= $0.33 \pm 0.10\%$ ). SP had lower incidences of OMB ( $P=0.0015$ ) and SD ( $P=0.01$ ) during loading than LP. At loading MT was 0.04% SP vs. 0% LP. At the harvest facility, LP had a lower incidence of SD ( $P<0.0001$ ) than SP; however, there were no ( $P>0.05$ ) differences between treatments for OMB, MT, fatigued, total non-ambulatory, or total losses. The incidence of injured pigs was 0% SP vs. 0.04% LP and there were no DOA's. In conclusion, pre-sorting and small pen size appeared to have some effect on reduced stress responses on farm. However, pre-sorting pigs prior to loading and large versus small pen size did not affect stress responses or transport losses at the plant.