

ANIMAL WELFARE

Title: Long distance transport of breeding stock- **NPB #06-181**

Investigator: John J. McGlone

Institution: Texas Tech University / Pork Industry Institute

Date submitted: 9/30/08

Scientific Abstract:

Long duration transport is an important animal welfare issue. Little experimental work exists on the effects of long duration transportation on breeding gilts. The goal of this project was to evaluate the effects of a 30 hour transport on acute physiological measures and reproductive parameters in breeding aged gilts.

In experiment 1, gilts were transported for up to 30 hour in a trailer allowing a space allowance of 0.504 m²/head which is common practice when shipping breeding gilts. In addition to 10 gilts per experimental treatment on the trailer, 3 control gilts remained in the home pen. Every 6 hours, pigs from one compartment were removed from the trailer (6, 12, 18, 24, and 30 hours duration of transport). Blood samples and body weights were collected from groups of gilts and their respective controls before and after transport (at 0, 6, 12, 18, 24, and 30 hours). The experiment was repeated twice in July 2007 in Lubbock, TX, USA and included 120 pigs. Leukocyte numbers and percentages, platelets, cortisol, albumin, aspartate aminotransferase, bilirubin, blood urea nitrogen, creatine kinase, glucose, total protein, and interleukin-8 concentrations differed in transported compared to control gilts. Cortisol and glucose concentrations, and the N:L, which are indicative of acute stress response to transportation, decreased as transportation duration increased. Total protein concentrations, indicative of mild dehydration, decreased after a 6 hour transport period. Reproductive performance (measured as farrowing rate, total born, born alive, stillborn, mummies, weight at processing, number weaned, and weight at weaning) was not affected by transport or duration of transportation. By following TQA guidelines, it is possible to transport breeding gilts in hot weather with limited short-term physiological effects and no long-term effects on health or reproductive performance.

In experiment 2, 2 space allowances were replicated 5 times in a commercial semi-trailer that allowed 0.334 and 0.409 m²/pig. In addition to 4 gilts per experimental treatment on the trailer, 4 control gilts remained in the home pen. Every 6 hours, pigs in one pair of compartments were removed from the trailer (6, 12, 18, 24, and 30 hours duration of transport). Blood samples and body weights were collected from groups of gilts and their respective controls before and after transport (at -24, 6, 12, 18, 24, and 30 hours). The experiment was repeated twice in October 2007 in Lubbock, TX, USA and included 120 pigs. Weight loss was greater ($P < 0.05$) among transported pigs relative

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.

For more information contact:

National Pork Board • PO Box 9114 • Des Moines, IA 50306 USA • 800-456-7675 • Fax: 515-223-2646 • pork.org

to controls after 6 hours of transport, however, after this initial weight loss body weights did not differ ($P > 0.05$) between transported and control gilts from 12 through to 30 hours of transport. Additionally, space allowance did not affect ($P > 0.05$) weight loss in gilts over time. Transient changes were seen in glucose, total protein, albumin, lymphocyte numbers, granulocytes numbers, neutrophil:lymphocyte ratio, hematocrit, and platelet numbers. Cortisol, creatine kinase, and aspartate aminotransferase differed from control gilts but not between space allowances. Reproductive performance (measured as farrowing rate, total born, born alive, stillborn, mummies, weight at processing, number weaned, and weight at weaning) was not affected by transport or duration of transportation.

The results from experiment 1 and 2 suggest that gilts transported for up to 30 hours only experience transient changes in physiological measures of stress as assessed by the parameters evaluated in these studies. Overall, these data indicate that the 28-hour law may be too conservative as we found no overwhelming negative health or well-being effects on breeding gilts after 30 hours of transport as compared to non-transported control gilts.