

Title: Stepwise discriminate and latent variable analysis of pre-harvest process factors influence on fresh pork quality – NPB #05-101

Investigator: Eric P. Berg, Ph. D.

Institution: North Dakota State University

Date Submitted: August 23, 2007

Abstract

Objectives of this study were to determine effects of seasonal environment, top and bottom deck transport, transport duration, and time in lairage on overall pork quality and blood serum concentrations of the stress hormone cortisol of market hogs. Mixed commercial crossbred market hogs (PIC, Franklin, KY) were harvested at dates representing traditional seasonal environments in the Midwestern United States: February 14 and 16, 2006 (n = 599), May 16 and 18, 2006 (n = 660), August 1 and 3, 2006 (n = 649), and October 17 and 19, 2006 (n = 661). Within season, pigs were randomly assigned to one of 8 treatments in a 2 x 2 x 2 factorial arrangement, with two transport durations; short (3 hours) or long (6 hours), two trailer deck locations; top or bottom, and two lairage durations; short (3 hours) or long (6 hours). Environmental conditions (temperature and relative humidity) in the trailer were monitored at one minute intervals using portable data loggers located in the three compartments (front, middle, rear) of both decks. All pigs originated from the same commercial source and identical transport procedure, data collection, and harvest procedure was repeated on Tuesday and Thursdays within the same week within season. Blood was collected from each carcass at exsanguination on the bleed table for analysis of serum cortisol concentration. Fresh pork loin quality parameters were evaluated on boneless pork loins for color (L*, a*, and b*), pH, and drip loss. Loins were classified as pale, soft, and exudative (PSE) if 24h drip loss exceeded 5% and L* was greater than 55. Least-squares means were generated and tested for least significant difference across all main effects and appropriate interactions for fresh pork quality parameters and serum cortisol concentration. Cortisol levels were the greatest during the summer and fall seasons and interacted significantly ($P < 0.05$) between lairage, deck, and haul. Pigs transported in the bottom deck (regardless of duration traveled or time spent in lairage) had a higher rate of PSE loins (6.94%) in the winter compared to loins from pigs transported in the winter on the top deck (3.58%). Furthermore, pigs removed from the bottom deck entering short lairage generated 5.28% PSE loins while the pigs that came off the bottom deck into a long lairage generated 2.86% PSE loins.

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, P.O. Box 9114, Des Moines, Iowa USA

800-456-7675, **Fax:** 515-223-2646, **E-Mail:** porkboard@porkboard.org, **Web:** <http://www.porkboard.org/>