

ANIMAL WELFARE

Title: Impact of Auto-sort Systems on Pig Welfare, **NPB #06-053**

Investigator: Janeen L. Salak-Johnson, PhD

Institution: University of Illinois

Date Submitted: February 5, 2008

Scientific Abstract:

Auto-sort technology was a relatively fast-growing, behavior-based production system that was implemented by early adopters without a full understanding of the impact these systems could have on pig productivity and well-being. Thus, we designed a series of studies that would provide producers with science-based information that would enable them to optimize these systems without unwittingly compromising pig well-being. The objectives of these studies were to assess the impact that various auto-sort layouts had on pig behavior, performance and overall well-being and to optimize an auto-sort system that could improve pig productivity and well-being. To accomplish these objectives a series of experiments were designed to: (1) investigate the impact that 3 different auto-sort layouts had on pig performance and well-being. These layouts (600 pigs per pen) consisted of (a) **food-court** (~40% of total floor space = “food-court”), (b) **water-pen** (~15% of total floor space = “water-pen”), (c) **fast-lane** (~12.5% of floor space/”zone”), and (d) **control** (large pens; 300 pigs/pen; 2 pens); (2) determine impact of food-court on performance and well-being when compared to (~600 pigs/ layout; 2 food-courts) both large conventional pens (300 pigs/pen; 2 total pens; ~600 pigs) and small conventional pens (35-40 pigs/pen = ~600 pigs); and (3) further optimize a food-court by investigating the impact of feeder type (**dry feeder** vs. **wet/dry feeder**) and feeder placement – **original placement** (2 sets of feeders in straight line) vs. **new placement** (feeders scattered) on pig productivity and well-being. Exp 1, regardless of auto-sort layout all pigs learned quickly to use the system. Auto-sort layout did affect time it took to enter and exit scales; pigs in water-pen took longer to enter scales during training process but exited quicker than did pigs from food-court or fast-lane ($P < 0.05$). Pigs from water-pen spent more time lying in scale during training process than did pigs in the other auto-sort systems ($P < 0.05$). Upon removal from pens and during loading, pigs in large pens vocalized and reared more than did pigs from auto-sort pens ($P < 0.01$). Prod use was less among auto-sort pigs than pigs from large pens ($P < 0.001$). Pigs from food-court were less difficult to handle while loading on truck than all other groups ($P < 0.01$). Total loading time was greater for pigs from large pens than any of the auto-sort groups ($P \leq 0.05$). Pigs from fast-lane loaded faster than did pigs from water-pens ($P < 0.05$). Behavioral patterns/sequences were significantly influenced by auto-sort layout. Specifically, number of pigs eating at once was greatest in food-court but, least in large pens and water-pens ($P < 0.001$). Duration of eating was greatest among pigs in food-court than fast-lane or water-pen ($P < 0.05$). Pigs in food-court and large pens performed more ear bites than did pigs in fast-lane ($P < 0.01$). Pigs in large pens engaged in more dyadic fighting bouts than did pigs in the fast-lane or water-pen ($P < 0.05$). But, pigs in food-court had the greatest duration and frequencies of aggressive encounters ($P < 0.01$). Pigs in water-pen were least active overall compared to pigs in other auto-sorts ($P < 0.05$). Among all pigs there was a shift in leukocyte population and cortisol in response to handling, loading and transportation; the magnitude of change was less among auto-sort pigs ($P < 0.01$). Percentage neutrophils was less in pigs from food-court and fast-lane post-transportation than pigs from water-pen or large pens ($P < 0.001$). Plasma IGF-1 was higher pre- and post-transportation in pigs from food-court than other treatment groups ($P < 0.05$). Pigs from food-court were more efficient and had less sort loss than all other treatment groups. Exp. 2, pigs from food-court handled and

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

loaded better than did pigs from either small or large pens ($P < 0.05$). Pigs from large pens were less difficult to handle and loaded better than did pigs from small pens ($P < 0.05$). Thus, pigs from large and small pens vocalized and reared more, required more prod use and took more time to load than did pigs from food-court ($P < 0.05$). Pigs from food-court showed less stress response than did pigs from large and small pens ($P < 0.05$). Exp 3, training was similar regardless of feeder type or placement. Pigs in pens with dry feeders had longer bouts of aggression than did pigs in pens with wet-dry feeders ($P < 0.01$). Pigs from pens with dry feeders also vocalized more upon removal from pens and during loading ($P < 0.05$) and those from pens with dry feeders and original feeder placement required more prod used ($P < 0.10$). Feeder placement influenced immature neutrophils, with pigs in pens with new placement had greater percentage than did those in pens with old ($P < 0.05$) but they tended to have lower cortisol post-transportation. Taken together, these data indicate that there are benefits associated with auto-sort systems based on measures of productivity, handling, behavior and overall well-being. Moreover, these data imply that feeder type and feeder placement can improve pig well-being.