

Title: Methods of Restoring Carcass Firmness and Other Post-Harvest Traits in Finishing Pigs Fed a High Level of Distillers Dried Grains with Solubles (DDGS) – NPB #09-109

Investigator: Gary L. Cromwell, PhD

Institution: University of Kentucky, Animal and Food Sciences Dept., Lexington, KY

Co-Investigators: Gregg K. Rentfrow, PhD and Merlin D. Lindemann, PhD, Miranda Ulery, MS, Graduate Student

Date Submitted: March 30, 2011

Scientific Abstract:

An experiment involving 168 pigs (6 replications of 3 or 5 pigs/pen) was conducted to determine if feeding a high level of DDGS followed by varying withdrawal periods before slaughter, or if adding a more saturated fat (tallow) to diets containing DDGS (to reduce the dietary U:S fatty acid [FA] ratio) would offset the softer bellies that occur when high levels of DDGS are fed. Treatments (Trt) were (1) a corn-soybean meal diet or (2) a similar diet with 45% DDGS fed continuously or removed during the final 2, 4, or 6 weeks (Trt 3, 4, 5) followed by the corn-soybean meal diet. Trt 6 and 7 were the same as 1 and 2 except 5% tallow was added. Three diet phases were fed from 37 to 121 kg body weight. Diets for Trt 1-5 were formulated on a true ileal digestible (TID) lysine basis with 0.81, 0.70, and 0.55% TID lysine during the 3 phases. Adjustments were made in diets containing tallow to maintain the same TID lysine:ME ratio across all diets. Average daily gain (ADG), but not feed/gain (F/G), was reduced by DDGS inclusion ($P < 0.05$), but ADG improved linearly ($P < 0.05$) with increasing time of DDGS withdrawal. ADG tended to improve with tallow addition to the DDGS diet and F/G improved ($P < 0.05$) with tallow addition to both diets. Backfat (inner and outer) and belly fat were obtained for FA analysis. Polyunsaturated FA (PUFA) of the 3 fat depots) increased when DDGS was fed ($P < 0.05$), and the changes were moderated (linear, $P < 0.05$) with DDGS withdrawal time. Iodine values (IV) followed similar trends. Tallow addition had little effect on PUFA and IV, particularly in pigs fed DDGS. Bellies from 3 pigs per pen (18 per trt) were pumped with brine, smoked, and sliced (9 slices/2.54 cm) at a commercial plant. Bacon slices (10/slab) were scored for shatter; fried and scored for distortion, cook loss, and shrink; and evaluated by an 8-member trained sensory panel. DDGS inclusion did not affect bacon yield but it improved shatter scores ($P < 0.05$). Greater distortion, cooking loss, and shrink ($P < 0.05$) occurred in fried bacon from pigs fed DDGS with withdrawal time having no effect. Tenderness and flavor of bacon was not affected by DDGS. Tallow did not consistent affect any of the measures. Sensory attributes of loin chops were not affected by DDGS, but tallow increased off-flavor ($P < 0.05$). The results indicate that withdrawal of a high level of DDGS from the finishing diet for 4 to 6 wk partially restores belly firmness, but addition of a harder fat does not overcome softer bellies. Except for an improvement in shatter scores and increased cooking loss, most of the other traits and eating quality of bacon and loin chops were not affected by DDGS. This project was funded by the National Pork Checkoff.

These research results were submitted in fulfillment of the Nutritional Efficiency Consortium research projects.

Contributing organizations for 2009 include: AgriSolutions, Inc., DPI Global, Iowa Pork Producers Association, Illinois Corn Marketing Board, Illinois Pork Producers Association, Kansas Pork Association, Missouri Pork Producers Association, Mississippi Pork Producers Association, National Pork Board, Nebraska Corn Board and the Utah Pork Producers Association.

This report is published directly as submitted by the projects 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
