

ANIMAL SCIENCE

Title: Comparison of Grain Sources (Barley, White Corn, and Yellow Corn) for Swine Diets and Their Effects on Meat Quality and Production Traits. NPB #01-156.

Investigator: Dr. John Mabry

Institution: Iowa State University

Co-investigators: Dr. Tom Baas, Dr. Palmer Holden, Jay F. Lampe

Date Received: 4/01/2003

Abstract

An experiment was conducted to evaluate the effect of energy source on performance and carcass traits of pigs. Diet treatments (primary energy source) were: 1) yellow corn, 2) white corn, 3) 1/3 yellow corn, 2/3 white corn, 4) 2/3 yellow corn, 1/3 white corn, 5) barley. Pigs completing the trial were from two sire lines, Duroc (n=500) and Hamp x Duroc (n=499), on PIC 1055 females. Pigs were randomly allocated to pens based on genetic type and gender using a 2 x 2 x 5 factorial arrangement with two genetic types, two sexes (barrows and gilts) and five treatments. Diets were fed in four phases: phase one (27.6 to 49.3 kg), phase two (49.3 to 67.2 kg), phase three (67.2 to 103.3 kg), and phase four (103.3 to 130.2 kg). The phase one diets were formulated to contain 1.12% lysine, .83% Ca, and .71% P. Phase two diet formulations contained .93% lysine, .73% Ca, and .56% P. Phase three diet formulations contained .71% lysine, .65% Ca, and .52% P. Phase four diets were formulated to contain .65% lysine, .63% Ca, and .46% P. Diets were supplemented with choice white grease, maintaining an iso-caloric status through phases one and two (67.2 kg). Choice white grease was limited to 1% in phases three and four (67.2 to 130.2 kg). Backfat (BF) and loin muscle area (LMA) were estimated one day prior to harvest by a trained technician using real-time ultrasound. All animals were held overnight at a commercial abattoir before harvest. One whole skin-on, boneless loin was collected from each carcass and held at -1 degree Celsius in a cryovac sealed bag at the Iowa State University Meat Lab. At 25 to 27 days post-harvest, loins were analyzed for meat and eating quality. Fatty acid composition was determined by standard gas chromatographic procedures. Loins were given an individual subjective fat color score.

Diet had no effect on ADG, ADFI, feed conversion (FG), ultrasound BF, or percent fat-free lean (FFL). Pigs fed diet 5 had a smaller ($P < 0.05$) LMA than pigs fed the other four diets. Pigs fed diet 5 had lower lean gain on test (LGOT) than pigs fed diets 1, 2 and 4, although diet 3 was not different ($P > 0.05$) from all treatment means. Diet treatment had no effect ($P > 0.05$) on 24 hour pH, sensory tenderness, sensory chewiness, Instron tenderness, loin purge, and cook loss. Pigs fed diet 4 had a higher ($P < 0.05$) loin pH than pigs fed diet 1 at 25 to 27 days post-harvest, although diets 2, 3, and 5, were not different from all

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/>

treatment means. Pigs fed diet 4 had a higher ($P < 0.05$) Japanese color score than pigs fed diets 2, 3, and 5, although diet 1 was not different from all treatment means. Pigs fed diet 3 had a higher percent intramuscular fat than diets 1 and 2, although diets 1, 4, and 5, and diets 1, 2, and 5, were not different ($P > 0.05$). Duroc-sired pigs had a higher ($P < 0.05$) 24 hour pH and Japanese color, and lower ($P < 0.05$) hunter color values than HD-sired pigs. Pigs fed diet 5 had a lower ($P < 0.05$) iodine value than pigs fed all other diets. Diet treatment had no effect on ($P > 0.05$) subjective fat color scores. Pigs fed diet 5 had higher ($P < 0.05$) saturated and monounsaturated fatty acids than pigs fed all other diets. Results suggest that different energy sources evaluated in this study do not have an effect on subjective fat color but do have an effect on fat firmness. Results suggest that different energy sources evaluated in this study have little effect on eating quality of pork that is held for 25 – 27 days post harvest. Results suggest that the energy sources evaluated in this study have no effect on pig performance, pigs fed barley had a smaller ($P < 0.05$) LMA than pigs fed the other four diets.