RESEARCHABSTRACT

ANIMAL SCIENCE — Nutritional Efficiency Consortium

Title: Assessment of the effects of diets containing DDGS with supplemental tallow on fat digestibility, growth performance, carcass and fat quality in growing-finishing pigs-**NPB #08-015** **revised**

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Date Submitted: 6/27/11

Scientific Abstract:

Effects of tallow and DDGS on pig performance, carcass characteristics, and pork fat quality. J. M. Pomerenke[1*], G. C. Shurson[1], S. K. Baidoo[2], and L. J. Johnston[3], [1] University of Minnesota, St. Paul, [2]Southern Research and Outreach Center, Waseca, and [3]West Central Research and Outreach Center, Morris.

A study was conducted to determine the effect of supplementing 5% beef tallow to grower-finisher diets containing 30% corn dried distillers grains with solubles (DDGS) on pig performance and carcass characteristics. Crossbred pigs (n=315) were blocked by initial BW (32.4 ± 1. 9 kg) and assigned randomly to 1 of 4 dietary treatments in a 3-phase feeding program using a 2 × 2 factorial arrangement of treatments. Pigs were housed in a confinement facility containing 40 pens with 7 to 8 pigs per pen to provide 10 replications per treatment. Gilts and barrows were housed separately, but fed common diets formulated to contain similar available P and Standardized Ileal Digestible Lys:ME across treatments. Diets consisted of a conventional corn-soybean meal diet (C), C containing 30% DDGS (D), C containing 5% tallow (T), and C with 30% DDGS and 5% tallow (DT). For fat quality characteristics, one pig from each pen was selected based being the closest to average pen BW (n = 20 barrows and 20 gilts). Data were analyzed using the Proc Mixed functions of SAS with random effect of block and fixed effects of DDGS, tallow, gender, and DDGS×tallow. Barrows had higher ADG, ADFI, and backfat, and lower G:F, and carcass lean % than gilts ($P < 0.01$). Overall ADG did not differ among treatments, but ADFI was higher for pigs fed C and D (2.8 and 2.8 kg, respectively) due to lower caloric density compared with T and DT (2.6 and 2.5 kg, respectively; $P < 0.01$). Consequently, pigs fed T and DT had higher ($P < 0.01$) G:F (0.40 and 0.41, respectively) than those fed C and D (0.37 and 0.37, respectively). Carcass yield was greater for pigs fed T and DT (79.5 and 79.4%, respectively) compared with pigs fed C and D (78.8 and 78.3%, respectively; $P < 0.01$). Backfat depth was reduced for pigs fed DDGS diets ($P < 0.02$), but

These research results were submitted in fulfillment of the Nutritional Efficiency Consortium research projects.
Contributing organizations for 2008 include: Arizona Pork Council, DPI Global, Eli Lilly/Elanco, Iowa Corn Growers Association, Iowa Pork Producers Association, Illinois Corn Marketing Board, Illinois Pork Producers Association, Kansas Corn Commission, Kansas Pork Association, Lucta USA, Minnesota Pork Board, Missouri Pork Producers Association, Monsanto, Mississippi Pork Producers Association, Montana Pork Producers Council, National Corn Growers Association, North Carolina Pork Council, Inc., National Pork Board, Nebraska Corn Board, Nebraska Pork Producers Association, Inc., Ohio Pork Producers Council, Pioneer Hi-Bred International, Inc., Utah Pork Producers Association and the Wisconsin Pork Association.

This report is published directly as submitted by the projects principal investigator. This report has not been peer reviewed.

increased for pigs fed tallow diets ($P < 0.01$). Hunter L* and b* values for backfat and belly fat were greater ($P < 0.01$) for pigs fed C and T diets compared to pigs fed D and DT. Similarly, Japanese Color Score for belly fat was higher for pigs fed D and DT. Pigs fed D and DT exhibited softer bellies compared to pigs fed C and T as indicated by belly flop angle. An interaction between DDGS and tallow was observed for belly fat iodine value (IV), indicating that tallow decreases IV when DDGS was included in the diet, but tallow increased IV when no DDGS was included. SFA was highest for C, but was reduced for T, D, and DT in the belly fat. Belly MUFA was similar for D and DT but lower for C and D. Belly and backfat PUFA were highest with D and DT compared to C and T. ($P < 0.01$) Backfat IV increased ($P < 0.01$) when either DDGS or tallow were fed. Backfat SFA was lowest for DT compared to all other diets. In summary, adding 5% tallow to 30% DDGS diets improved G:F and carcass yield, but increased backfat depth and reduced the percentage of carcass lean. In conclusion, adding 5% tallow to diets containing 30% DDGS did not improve pork fat firmness.