

POSTER PRESENTATIONS

Growth, Development, Muscle Biology, and Meat Science

145 The effects of dietary astaxanthin, ractopamine HCl, and gender on the growth, carcass, and pork color characteristics of finishing pigs. J. R. Bergstrom,* J. L. Nelssen, T. A. Houser, M. D. Tokach, R. D. Goodband, J. M. DeRouchey, and S. S. Dritz, *Kansas State University, Manhattan*.

A total of 144 finishing pigs (initially 102 kg) were used to evaluate the effects of ractopamine HCl (RAC) and various levels and sources of added dietary astaxanthin (AX), on growth, carcass, and pork color characteristics of barrows and gilts. Pigs were blocked by gender and weight and randomly allotted to 1 of 9 dietary treatments fed for approximately 26 d pre-harvest. Dietary treatments consisted of a corn-soybean meal-based control diet, the control diet with 5, 7.5, or 10 ppm AX from *Phaffia rhodozyma* yeast, the control diet with 5 ppm synthetic AX, and the control diet with 10 ppm RAC and 0, 2.5, 5, and 7.5 ppm AX from *Phaffia rhodozyma* yeast. There were 2 pigs per pen and 8 pens per treatment (4 pens per treatment \times gender combination). Overall, barrows had greater ($P < 0.01$) ADG and ADFI than gilts, while ADG and final BW increased ($P < 0.01$) and G:F improved for pigs fed RAC. For carcass characteristics, barrows had greater ($P < 0.01$) backfat depth and less ($P < 0.01$) longissimus muscle area and fat-free lean than gilts. Pigs fed RAC had greater ($P < 0.01$) HCW, yield, and longissimus muscle area than those not fed RAC. Growth performance and carcass characteristics of pigs fed AX were not different than control pigs. Although there were no differences in the initial NPPC color scores, discoloration scores of longissimus chops increased (linear, $P < 0.01$) daily during 7 d of retail display, and were greater ($P < 0.01$) for barrow chops on d 7 compared with gilt chops (gender \times d interaction, $P < 0.01$). Also, the overall average discoloration scores and d 0 to 3 objective total color change ($\Delta E = \sqrt{[\Delta CIE L^*]^2 + [\Delta CIE a^*]^2 + [\Delta CIE b^*]^2}$) were lower ($P < 0.01$) for longissimus chops from gilts and pigs fed RAC, although the difference between gilts and barrows was smaller when they were fed RAC (gender \times treatment interaction, $P < 0.01$). Modest differences in instrumental measures (CIE L^* , a^* , b^*) of longissimus chop color were associated with added dietary AX during retail display, but these did not result in an increase in color shelf-life or reduction in the objective measure of total color change. Collectively, these observations indicated a greater ($P < 0.01$) color shelf-life for chops from gilts and pigs fed RAC.

Key Words: astaxanthin, pigs, pork color

146 The effects of dietary astaxanthin and ractopamine HCl on the growth and carcass characteristics of finishing pigs, and the color shelf-life of longissimus chops from barrows and gilts. J. R. Bergstrom, T. A. Houser, G. R. Skaar,* J. L. Nelssen, M. D. Tokach, R. D. Goodband, J. M. DeRouchey, and S. S. Dritz, *Kansas State University, Manhattan*.

A total of 160 pigs (initially 90.4 kg) were used to evaluate the effects of increasing dietary astaxanthin (AX, from *Phaffia rhodozyma* yeast) and ractopamine HCl (RAC) on the growth and carcass characteristics of finishing pigs, and the color shelf-life of longissimus muscle (LM) chops from barrows and gilts. Pigs were weighed and randomly allot-

ted to 1 of 8 dietary treatments fed for approximately 26 d pre-harvest. Dietary treatments consisted of a corn-soybean meal-based control diet, the control diet with 7.5, 15, 30, 60, or 120 ppm AX, and a corn-soybean meal-based diet with 10 ppm RAC and 7.5 or 20 ppm AX. There were 2 pigs (1 barrow and gilt) per pen and 10 pens per treatment. A split-plot design with repeated measures was used to compare color characteristics of LM chops from individual barrows and gilts. Overall, pigs fed RAC had increased ($P < 0.01$) ADG, final BW, and G:F compared with pigs not fed RAC. Among pigs not fed RAC, there was improved (quadratic, $P < 0.05$) G:F and a trend (quadratic, $P < 0.06$) for increased ADG with increasing AX to 60 ppm. For carcass characteristics, pigs fed RAC had greater ($P < 0.03$) HCW, 10th-rib LM area, 24-h LM pH, and fat-free lean index than those not fed RAC treatments. Among pigs not fed RAC, there was a trend (quadratic, $P < 0.07$) for increased yield with increasing AX. During 6 d of retail display, the initial (d 0) NPPC color score of LM chops from gilts was greater ($P < 0.03$) than that of chops from barrows. Subjective discoloration scores of LM chops did not differ initially, but increased (linear, $P < 0.01$) daily, and were greater ($P < 0.02$) on d 6 for chops from barrows and pigs not fed RAC compared with chops from gilts and pigs fed RAC (gender \times d and treatment \times d interactions, $P < 0.04$). The CIE a^* and CIE b^* of LM chops decreased (linear, $P < 0.01$) during retail display, and chops from gilts and pigs fed RAC had lower ($P < 0.04$) CIE b^* than chops from barrows and pigs not fed RAC, especially on d 0 (gender \times d and treatment \times d interaction, $P < 0.01$). Overall (d 0 to 6), discoloration score and change in objective total color (ΔE) were lower ($P < 0.02$) for LM chops from gilts and pigs fed RAC. These observations suggest that color shelf-life was extended for chops from gilts and pigs fed RAC.

Key Words: astaxanthin, pigs, pork color

147 Corn distillers solubles does not affect beef quality. K. Varnold,* A. Haack, J. Hergenreder, S. Pokharel, L. Senaratne, A. Pesta, G. Erickson, and C. Calkins, *University of Nebraska, Lincoln*.

When distiller's grains with solubles are fed to cattle they can cause the meat to have a decreased shelf life and an increased susceptibility to oxidation. The objective was to determine if the same detrimental effects would be seen if only corn distiller's solubles (CDS) were fed. Cattle ($n = 250$) were fed 1 of 5 levels of CDS (0, 9, 18, 27, and 36%, on a DM basis) for 132 d. No distiller's grains were added to the corn-based diets. After harvest, 75 strip loins, 15 from each treatment, grading USDA Choice or higher were selected and shipped to the University of Nebraska's Meat Laboratory where they were aged for 14 d. After aging, 3 steaks from each strip loin were placed in retail display for 0, 4, and 7 d to be used to measure oxidation. At the end of the retail display period, steaks were powdered and oxidation was measured by quantifying thiobarbituric acid reactive substances (TBARS). The 7 d retail display steaks were also used for objective measurement of color and subjective evaluation of discoloration, with readings performed every day. Data were analyzed using PROC Mixed of SAS with repeated measures. Overall, there were no differences between