

CP) with 2% corn oil. Three additional diets with the same level of SBM included increasing levels of corn oil resulting in total corn oil contents of 5, 8, and 11%. The corn oil replaced cornstarch, while all other ingredients remained the same as the first diet. An additional diet contained soy protein concentrate (SPC), which replaced SBM on an isolysine basis. The final diet contained casein as the protein source. The SPC and casein diets included 2% corn oil. Apparent amino acid digestibility was calculated using chromic oxide in the diet as an indigestible marker. The diet containing SBM had consistently greater AD of essential amino acids than SPC ( $P < 0.05$ ). These amino acids included isoleucine (83.2 vs 80.6%), leucine (83.0 vs 79.5%), methionine (85.4 vs 81.6%), and threonine (76.4 vs 69.4%). In addition, the AD of amino acids in SBM was greater than casein for arginine, isoleucine, tryptophan, and threonine ( $P < 0.05$ ). No differences in the AD of lysine were observed among the three protein sources (84.8, 82.5, and 84.9% for SBM, SPC, and casein, respectively). The AD of amino acids of the SBM used in this trial agree with the values reported in the NRC; however, the AD values for SPC and casein were lower than reported in the NRC. No improvement in AD in SBM was observed with increasing dietary corn oil from 2% to 11% for any of the amino acids measured. These results demonstrate further processing of soybean meal to soy protein concentrate does not improve apparent amino acid digestibility and increasing the level of corn oil in the diet does not significantly increase apparent amino acid digestibility of soybean meal.

**Key Words:** Pigs, Digestibility, Amino Acids

**171 Growth performance, carcass characteristics, and pork color in finishing pigs fed two sources of supplemental iron.** K. L. Saddoris<sup>1</sup>, T. D. Crenshaw<sup>1</sup>, J. R. Claus<sup>1</sup>, and T. M. Fakler<sup>2</sup>, <sup>1</sup>University of Wisconsin, Madison, <sup>2</sup>Zinpro Corporation, Eden Prairie, MN.

The potential for two iron sources to induce a pork color change was evaluated in pigs. 72 pigs (D×LR×LW) ~70 kg were randomly assigned to dietary treatments. Treatments consisted of a corn-soybean meal Control diet (50 ppm Fe added from iron sulfate), Control + 90 ppm Fe from iron sulfate, and Control diet + 90 ppm Fe from Availa-Fe 60. Three trials were conducted, each with 2 pens/treatment and 4 pigs/pen, and pen was used as the experimental unit. Pigs were fed their diets for 47 d and then slaughtered. Carcass traits were assessed at 24 h postmortem. Loin color and purge loss was assessed during a 7 d storage (2-3°C), and Minolta and reflectance spectrophotometry measurements were made on d 1, 3, 5, 7. Differences among dietary treatments were not detected ( $P > 0.10$ ) in ADG, ADFI, or gain:feed ratio. Backfat, LEA, loin pH, and 24 h L\* and b\*, and subjective color, marbling, and firmness scores did not differ ( $P > 0.10$ ) among treatment groups. The 24 h a\* value was lower ( $P < 0.05$ ) for pigs fed the iron sulfate diet compared to the control. During storage, L\*, b\*, and estimated deoxymyoglobin, metmyoglobin, and oxymyoglobin did not differ ( $P > 0.10$ ) among treatment groups. Availa-Fe 60 increased ( $P < 0.05$ ) a\* values on d 1, 3, 5, 7 compared with the iron sulfate fed groups, and increased ( $P < 0.05$ ) a\* values on d 3, 5, 7 compared with the control fed groups. Iron sulfate decreased ( $P < 0.05$ ) a\* value on d 1 of storage compared to pigs fed the control and Availa-Fe 60 diets. Purge loss was decreased ( $P < 0.05$ ) by pigs fed iron sulfate (4.82%) and Availa-Fe 60 (4.64%) compared to the control (5.40%). In conclusion, 90 ppm of both iron sulfate and Availa-Fe 60 had no beneficial effects on growth, carcass composition, or 24 h pork color. On d 7 of storage, Availa-Fe 60 increased redness 5.3% compared to pigs fed the control diet (a\* 7.86 control vs 8.28 Availa-Fe). Iron supplementation of 90 ppm from iron sulfate or Availa-Fe 60 resulted in a 10-15% reduction in purge loss over the 7 d storage.

**Key Words:** Pigs, Color, Iron

**172 The effect of a calcified seaweed product on growth performance, carcass traits, and meat quality in swine.** D. W. Dean\*, L. L. Southern, and T. D. Bidner, Louisiana State University Agricultural Center, Baton Rouge.

Two experiments were conducted to determine the effects of a calcified seaweed product (CSP) in diets for pigs. The CSP (Marigro) contained 30% Ca (100% bioavailable as previously determined) and was added at the expense of limestone in both experiments. In Exp. 1, 64 crossbred barrows and gilts (76.9 kg average initial BW and 110.6 kg average final BW) were blocked by weight and allotted to pens based on sex and

ancestry. There were four replications of barrows and four replications of gilts with four pigs/replicate. The pigs were fed diets containing 0 or 0.50% CSP in a 57-d growth assay. Growth performance and carcass traits were not affected by CSP ( $P > 0.10$ ). Minolta L\* and b\* values were increased by CSP ( $P < 0.05$ ). However, there were no effects on initial and final pH, drip loss, or subjective color and marbling scores of the longissimus muscle ( $P > 0.10$ ). In Exp. 2, 150 weanling barrows and gilts (5.7 kg average initial BW) were allotted to three treatments and used in a 178-d growth assay. Each treatment was replicated 10 times (five replications/sex) with five pigs/replicate for the nursery phase (d 0 to 33). After the nursery, the five replications of gilts were continued on their dietary treatments until slaughter (117.3 kg average final BW). Pigs were fed 0, 0.25, or 0.50% CSP. Overall rate and efficiency of gain in the nursery period were linearly decreased ( $P < 0.08$ ) by CSP; however CSP did not affect ( $P > 0.10$ ) growth performance in the growing and finishing periods. Carcass lean and fat measurements as well as pork quality measurements were not affected ( $P > 0.10$ ) by CSP. These results suggest that CSP may be substituted for limestone through the growing and finishing phases with no adverse effect on growth or carcass traits.

**Key Words:** Pork Quality, Carcass, Seaweed

**173 Influence of dietary energy on growth performance of the late nursery pig.** C. Hastad\*, M. Tokach, J. Nelsens, S. Dritz, R. Goodband, and J. DeRouchey, Kansas State University, Manhattan.

Two studies were conducted to evaluate the effects of increasing energy density in nursery pig diets. In Exp. 1, 200 pigs with an initial BW of 13.7 kg were used in a 21-d growth assay. Pigs were allotted to one of five dietary energy levels of 3,047, 3,157, 3,268, 3,378, and 3,489 kcal of ME/kg. Energy densities were achieved by substituting wheat bran or soybean oil for corn in the corn-soybean meal based diets. All diets were formulated to 1.30% true digestible lysine. Overall, increasing dietary ME resulted in a linear increase in ADG ( $P < 0.02$ ; 703, 714, 728, 735, and 753 g/d) and gain/feed ( $P < 0.01$ ; 0.64, 0.63, 0.67, 0.67, 0.69). Experiment 2 was conducted at a commercial nursery facility in southeast MN. We used 1,415 pigs with an initial BW of 11.8 kg in a 21-d growth assay. Pigs were fed corn-soybean meal diets with increasing amounts of choice white grease (0, 1.5, 3, 4.5, and 6%). All diets were formulated to contain 4.5 g total lysine/Mcal ME. From d 0 to 7, ADG increased (quadratic  $P < 0.01$ ; 495, 531, 564, 544, 522 g/d) with increasing dietary energy with the largest improvement observed when 1.5% fat was added to the diet. Feed intake decreased (linear,  $P < 0.02$ ; 714, 716, 725, 695, 678 g/d) and G:F improved (linear,  $P < 0.01$ ; 0.69, 0.74, 0.78, 0.78, 0.77) with increasing energy. For d 7 to 14 and 14 to 21, increasing energy reduced ( $P < 0.01$ ) ADFI and improved G:F ( $P < 0.01$ ); however, there was no difference ( $P > 0.23$ ) in ADG. Overall, increasing dietary energy reduced ADFI (linear,  $P < 0.01$ ; 887, 876, 856, 834, 822 g/d) and improved feed efficiency (linear,  $P < 0.01$ ; 0.64, 0.67, 0.68, 0.70, 0.71); however, ADG was not affected ( $P > 0.26$ ; 564, 583, 583, 580, 582 g/d). These studies indicate that increasing dietary energy for nursery pigs during the late nursery phase linearly improves feed efficiency; however, the effect on ADG is less consistent.

**Key Words:** Pigs, Energy, Fat

**174 Monitoring the effects of ractopamine in market hogs, the effects on barrows and gilts.** B. S. Zimprich\* and M. J. Marchello, North Dakota State University, Fargo.

Twenty-four crossbred barrows and twenty-four crossbred gilts were randomly assigned to diets at 86 kg BW. The pigs were housed in individual pens in a climate-controlled room. Corn-soybean meal diets for the barrows contained 14% CP and 0.7% Lys (BLL); 14% CP and 1.2% Lys (BHL); 14% CP and 1.2% Lys plus ractopamine at 10 ppm (BHLR); or 16% CP and 1.05% Lys plus ractopamine at 10 ppm (BR). Diets for the gilts consisted of 15% CP and 0.7% Lys (GLL); 15% CP and 1.2% Lys (GHL); 15% CP and 1.2% Lys plus ractopamine 10 ppm (GHLR); or 16% CP and 1.05% Lys plus ractopamine at 10 ppm (GR). Pigs were maintained on the respective treatment diets for four wk, pigs were then slaughtered and carcass data was collected. Barrows on BHLR diet ended the collection period heavier than barrows on diet BLL (117 vs 111.62 kg,  $P < 0.01$ ). Pigs on BHLR and the BR diets had a higher ADG than pigs on the BLL diet (0.92, 0.90 vs 0.75 kg;  $P < 0.04$ ). Barrows on BHLR and BR diets had a more desirable gf than barrows