for MEI (8.52 versus 8.54 Mcal/d, $P = 0.49$) or NEI (6.39 versus 6.44 Mcal/d, $P = 0.13$). Overall gain:feed (0.362 versus 0.377), ADG:Mcal MEI (0.113 versus 0.117) and ADG:Mcal NEI (0.198 versus 0.2045) were less ($P < 0.001$) for pigs fed the LE than HE diets. Sire line by sex interactions existed ($P < 0.02$) for ADG:Mcal MEI and ADG:Mcal NEI. Pigs fed the LE diets had nearly identical daily NE and ME intakes but grew slower and less efficiently than pigs fed the HE diets.

Key Words: energy intake, pigs, growth rate, feed efficiency

235 The impact of feeding diets of high or low metabolizable and net energy concentration of weight of primal and subprimal lean cuts. A. P. Schinckel*[1], M. E. Einstein[1], S. Jungst[2], C. Booher[2], B. Fields[2], N. Matthews[2], C. Fralick[3], A. Sosnicki[2], and R. D. Boyd[4], *[1]Purdue University, West Lafayette, IN, [2]PIC North American, Hendersonville, TN, [3]Swine Tek, LLC, Convoy, OH, [4]Hanor Companies, Franklin, KY.*

Barrows (n = 2,178) and gilts (n = 2,274) from 4 sire lines were phase fed a series of either high energy (HE) or low energy (LE) diets from 27 kg BW to target BWs of 118, 127, 131.5 and 140.6 kg. The LE diets fed had 3.14 to 3.19 Mcal ME/kg, and 16 to 23% wheat middlings. The HE diets had 3.41 to 3.45 Mcal ME/kg and 4.5 to 4.95% choice white grease. All diets contained 6% DDGS and were formulated within phases to the same lysine:Mcal ME ratios. The weight of carcass primal and subprimals were collected. The weight of each cut was fitted to allometric functions ($Y = AX^B$) of carcass weight. The significance of diet, sex or sire line with A and B was evaluated by transforming the equations to a linear form using log to log-transformation. The effect of diet on A did not interact ($P > 0.20$) with sex or sire line. Thus, the final model was cut weight = $(1 + (C \{Diet\}))(A(CW)^B)$ where Diet = −0.5 for the LE and 0.5 for HE diets and A and B are sire line – sex specific parameters. The value of C is an multiplicative estimate of the diet effect with a value of C = 0.01 indicating a 1% greater value for HE pigs than LE pigs. Diet had no impact on wholesale loin, Boston butt, picnic, baby back rib, or spareribs weights ($P > 0.10$, C = −0.003, −0.0029, 0.0002, 0.0047, −0.0025). Three muscle ham weight was affected by diet (C = −0.014, $P = 0.001$) as was boneless loin (C = −0.010, $P = 0.001$), tenderloin (C = −0.023, $P = 0.001$) and sirloin weight (C = −0.009, $P = 0.034$). Feeding the HE diets had little impact on primal cut weight except to increase belly weight. The HE diets reduced the weight of lean trimmed cuts by 1 to 2 percent.

Key Words: dietary energy concentration, carcass, pork, primal weight

236 Is starch an essential nutrient for growing pigs? X. Zeng*1,2 and A. D. Beaulieu[1], *[1]Prairie Swine Centre Inc., Saskatoon, SK, Canada, [2]University of Saskatchewan, Saskatoon, SK, Canada.*

Distillers dried grains with solubles (DDGS), a by product of the ethanol industry, are widely used in the swine industry. The main difference between DDGS and the parent grain is the low starch content of the DDGS, which was converted to ethanol during fermentation. Diets formulated with high DDGS will therefore have a reduced starch content. The overall objective of this experiment was to determine if reduced dietary starch will limit protein deposition in growing pigs. Six diets, consisting of 5 semi-purified iso-nitrogenous and iso-caloric diets with increasing starch content (0, 5.5, 11, 16.5 and 22%) and one commercial reference diet were fed to growing pigs for 26 d. Diets were made iso-caloric with canola oil. Four blocks of 12 gilts (8.5 ± 1 kg) each were randomly assigned within block to one of the 6 treatments. Two additional pigs from each block were slaughtered on d 0 for baseline carcass measurements. ADG improved as starch content increased ($P < 0.05$), but ADFI (0.68 kg/d) and gain/feed (0.67) were unaffected ($P > 0.1$). Gross energy and DM digestibility improved, but ether extract digestibility decreased with increasing starch ($P < 0.05$). Crude protein digestibility tended to increase as the content of dietary starch increased ($P = 0.06$). Blood metabolites were measured for 8 h post-feeding on d 24. C-peptide (pro-insulin) increased and BUN decreased with increasing starch ($P < 0.05$). Blood glucose concentration, however, was similar between treatments (6.1 mmol/L; $P > 0.05$). Carcass protein and water deposition increased with increasing dietary starch ($P < 0.05$). The efficiency of utilization of CP for protein gain tended to increase with increasing starch content ($P = 0.10$). Fat and ash deposition were unaffected by treatment ($P > 0.05$). In conclusion, protein deposition improved with increasing starch content of the diet. Maximizing the inclusion of DDGS in swine diets may require a consideration of the starch content of the overall diet to maintain optimal protein deposition.

Key Words: swine, starch, DDGS

237 The effects of feeder design, wet-dry feeder adjustment strategy, and diet-type on the growth performance and carcass characteristics of growing-finishing pigs. J. R. Bergstrom,* M. D. Tokach, S. S. Dritz, J. L. Nelssen, J. M. DeRouchey, and R. D. Goodband, *Kansas State University, Manhattan.*

A total of 1,287 pigs (PIC 337 × 1050, initially 38 kg) were used to compare the effects of a conventional dry (CD) feeder, 3 wet-dry (WD) feeder adjustment strategies, and 2 diet-types on finishing pig performance (4 × 2 factorial arrangement). For pigs with a CD feeder, water was provided separately with a cup waterer. Water was provided in the feeder trough for pigs with a WD feeder. There were 27 pigs/pen and 6 pens/treatment in a CRD. The WD adjustment strategies were: 1) setting of 18 (3.2 cm opening) for the entire study (WD18); 2) setting of 18 until d 56 with a setting of 14 (2.5 cm opening) from d 56 to 92 (end of the experiment; WD14); and 3) setting of 18 until d 28, setting of 14 from d 28 to 56, and a setting of 10 (1.9 cm opening) from d 56 to 92 (WD10). The CD feeder remained at the same setting (~2.3 cm below gate) from d 0 to 92. The 2 diet-types were a corn-soybean meal-15% DDGS diet and a corn-25% DDGS-20% bakery by-product-soybean meal diet. Overall (d 0 to 92), pigs fed using the WD feeder had greater ($P < 0.001$) ADG, ADFI, and final BW than pigs fed with the CD feeder. However, within the WD treatments, pigs fed with WD14 and WD10 had reduced ($P < 0.05$) ADG (both 1.01 kg/d) compared with pigs fed with WD18 (1.04 kg/d). Additionally, ADFI of pigs fed using WD10 was lower (2.70 kg/d; $P < 0.05$) than that of pigs fed with WD18 (2.79 kg/d), with WD14 being intermediate (2.74 kg/d). There were no differences in G:F among feeder treatments, and growth performance was similar between the 2 diet types. Pigs fed using the WD feeder had greater ($P < 0.02$) HCW, yield, backfat depth, revenue per pig, and feed cost per pig than pigs fed with the CD feeder. Loin depth of pigs fed using the WD feeder was less ($P < 0.04$) than that of pigs fed with the CD feeder. Differences in backfat and loin depth resulted in pigs using the WD feeder having lower ($P < 0.001$) fat-free lean index (FFLI) than pigs fed with the CD feeder. However, within the WD feeder treatments, pigs fed with WD10 had reduced ($P < 0.05$) backfat depth and increased ($P < 0.05$) FFLI compared with pigs fed with WD18, with WD14 being intermediate. In conclusion, a reduced setting of the WD feeder in later growth periods improved carcass leanness while maintaining an advantage in growth rate.

Key Words: dry feeder, feeder adjustment, wet-dry feeder