leaner than calves fed 27/33. Feeding 180g of CP in the MR improved calf performance when compared to 90 g/d in the 21/21 diet.

Key Words: Jersey calves, Milk replacer, Body composition

Meat Science & Muscle Biology: Genetics and management of meat quality

541 Effect of sire line and slaughter weight on pork quality. M. A. Latorre[1], M. D. García-Cachín[2], A. Fuentetaja[3], R. Lazaro*[1], and G. G. Mateos[1], [1]*Universidad Politécnica de Madrid. Spain,* [2]*Estación Tecnológica de la Carne. Salamanca, Spain,* [3]*Copese S.A. Segovia, Spain.*

A trial was conducted to study the influence of sex (barrows; gilts), sire line (Danish Duroc, DD; Dutch Duroc x Large White, DHxLW; Pietrain x Large White, PxLW), and slaughter weight (120 kg; 135 kg) on meat quality. Dam line was Landrace x Large White in all cases. Each treatment was replicated four times and the experimental unit was formed by five samples of muscle *longissimus* (150 $\pm$ 15 g), obtained at the last rib level from five pigs penned together during the growth period. Carcasses were obtained from pigs that had a common feeding program with free access to diets based on corn and soybean meal. Meat from castrates had more intramuscular fat (2.8 vs 2.5%) and higher a* value (4.63 vs 4.34) than meat from gilts ($P < 0.05$), but gender did not modify tenderness or cooking or thawing losses. Loins from DD had less protein (23.8 vs 24.0% and 24.1%; $P < 0.01$) and more intramuscular fat (3.0 vs 2.4%, and 2.5%; $P < 0.001$) than loins from DHxLW or PxLW. Also, meat from DD crossbreds had less moisture than meat from DHxLW crossbreds, with meat from PxLW crossbreds in an intermediate position (73.5, 73.9, and 73.7%; $P < 0.01$). The PxLW sired-pigs had higher b* value than DD or DHxLW sired-pigs (9.89 vs 9.46 and 9.19; $P < 0.01$). No influence of boar line on resistance to cutting or water holding capacity was observed. An increase in slaughter weight increased intramuscular fat (2.8 vs 2.5%; $P < 0.01$) and tended to decrease moisture content of the meat (73.6 vs 73.8%; $P < 0.10$). Loins from heavier pigs were redder (4.75 vs 4.21; $P < 0.001$) and had more intense color (10.7 vs 10.3; $P < 0.01$) and less thawing losses (6.4 vs 8.7%; $P < 0.001$) than loins from lighter pigs. We conclude that DD is an atractive sire line that can be used as an alternative to DHxLW or PxLW for production of dry-cured products from heavy pigs. Also, an increase of slaughter weight improved some aspects of meat quality that might be of benefit for quality of dry-cured products.

Key Words: Sire line, Slaughter weight, Pork quality

542 The effect of lorry on meat quality. Cs. Abrahám*, J. Seenger, and E. Szûcs, *Szent István University, Gödöllo-Hungary.*

The aim of this research was to establish effects of two different lorry types on meat quality traits. In addition, the objective was to establish relationships between meat quality parameters. A further question was whether there are differences in various parts of the same muscle in terms of meat quality traits measured at the cut surface of the medial and lateral sides of M. longissimus dorsi (LD). For transport of pigs two different lorry types were compared: (A) single-decker lorry and (B) double-decker one. Pigs (n=100) were transported from the pig farm to the abattoir (130 km distance). The animals were slaughtered according to commercial procedure. After slaughter and/or chilling for 24 h meat quality traits were recorded as follows: pH_{45} and temperature in LD, as well as pH_u. Meat color was measured using MINOLTA CR 300 Chromameter (Minolta GmbH, Germany) at two anatomical (medial and lateral) parts of the LD cut surfaces. Data were processed and analyzed using software of SPSS 10.0 statistical program package. Significant differences were found between distributions of meat quality traits, which were assigned to PSE, normal and DFD categories. Lorry type A proved to be superior to lorry B showing a lower amount of PSE (18 vs. 34 %). The reason for the adverse phenomenon might be due to loading and unloading which was rather complicated with lorry B, and in this case frequent use of different tools for driving of animals was needed. It resulted in higher level of stress. Comparing the medial and lateral sides of the LD revealed significant differences for L$*$ and a$*$. Coefficients of correlation between meat quality traits reveal close, negative relationship of L$*$ with pH_u ($r = -0.76$). No association was established between L$*$ and LD temperature and surface reflectance. A relatively low coefficient of correlation was calculated for the relationship of LD temperature with surface reflectance (r=0.36).

Key Words: Pigs, Animal transport, Meat quality

543 Effects of available dietary carbohydrate and pre-slaughter stress on glycolytic potential and quality traits of pig muscles. G. Bee*, *Swiss Federal Research Station for Animal Production, Posieux Switzerland.*

The objective of the study was to evaluate the effects of pre-slaughter stress and dietary treatments known to affect post mortem muscle metabolism on the glycolytic potential (GP) and quality traits of the longissimus (LM) and semitendinosus muscles (light: STL; dark: STD portion). A total of 48 Swiss Large White pigs (24 gilts, 24 barrows) were selected at 88 kg and individually fed 2.6 kg of a diet either high (H) or low (L) in available carbohydrate up to 107 kg. In order to simulate pre-slaughter stress, 6 gilts and 6 barrows from each dietary treatment were subjected to a transporting stress for 3 h prior to slaughter. The remaining pigs were walked from the pen to the abattoir avoiding all unnecessary stress. In the samples collected 24 h post mortem of the LM, STL and STD the GP was determined. Measurements of the pH were carried out in the LM 30 min and 24 h post mortem and in the STD and STL 24 post mortem. Minolta L*, a*, b* values were assessed the day after dissection. In addition, muscles aged for 1 d and stored at -20C were thawed overnight at 4C (thawing loss) and then cooked to an internal temperature of 69C (cooking loss). Compared to the H-pigs, muscles of L-pigs had a lower GP (LM: 144 vs. 154 μmol/g; STL: 116 vs. 104 μmol/g; STD: 101 vs. 88 μmol/g; $P < 0.02$ for each). Regardless of the diet, pre-slaughter stress reduced the GP in the STD (90 vs. 99 μmol/g; $P < 0.05$), but not in the LM and STL. Neither diets nor pre-slaughter stress affected pH, but stress decreased meat temperature in the LM 30 min post-mortem (39.6 vs. 40.4C: $P < 0.01$). In the STL, L* (51.6 vs. 54.1) and b* values (3.4 vs. 4.2) were lower in pigs fed diet L ($P < 0.03$). Unexpectedly, pres-slaughter stress further accentuated the differences within diets ($P < 0.01$). Diet L reduced cooking losses of the STD (14.5 vs. 16.0%) and STL (12.8 vs. 13.6%; $P < 0.04$). Pre-slaughter stress increased thawing (7.5 vs. 6.4%) and cooking losses (13.6 vs. 12.8%; $P < 0.02$ for each) only in the STL. The present data revealed that the diet induced decrease of the GP positively affected meat colour and reduced thawing and cooking losses, whereas pre-slaughter stress accentuated the negative effects only in the STL.

Key Words: Feeding, Pre-slaughter stress, Pork quality

544 Growth parameters and carcass merit of market hogs supplemented creatine monohydrate in conjunction with ractopamine hydrochloride (Paylean) and a high glycemic carbohydrate. C. A. Stahl*[1], M. S. Carlson[1], D. L. McNamara[1], T. B. Schmidt[1], D. J. Newman[1], C. M. Schultz Kaster[2], and E. P. Berg[1], [1]*University of Missouri, Columbia, MO,* [2]*Premium Standard Farms, Milan, MO.*

Crossbred barrows (n=128; 85kg) were blocked by weight and allotted to one of 16 pens (eight pigs/pen; four reps/treatment) using a completely randomized design. Treatments consisted of diets A (pelletted corn-soybean base formulated to meet or exceed all NRC requirements), B (diet A supplemented with 0.92% creatine monohydrate (CMH) and 2.75% dextrose), C (Diet B supplemented with 4.5 g/ton Paylean) and D (diet A supplemented with 4.5 g/ton Paylean). Animal weight and feed disappearance was recorded at 9d intervals throughout the 27d testing duration to determine ADG and feed efficiency. In addition, real-time ultrasound was used to establish 10th rib fat depth (FD) and loin muscle area (LMA) on d1 and 27. No treatment differences were noted when comparing ADG (P=0.66) and cold carcass weight (P=0.51). Over the 27d test, diets C and D expressed the greatest improvement in LMA growth (A: 6.84; B: 7.61; C: 9.35; D: 9.03 +/-0.58cm^2, P<0.01). Additionally, diet affected d27 FD (A: 2.21; B: 1.90; C: 1.93; D: 1.85 +/- 0.08cm, P<0.05) and total fat accumulation (A: 0.69; B: 0.48; C: 0.46; D: 0.36 +/- 0.05cm, P<0.001). Moreover, boneless loin chops of animals fed diet C possessed a greater percentage of intramuscular fat than animals supplemented diet D (A: 2.43; B: 2.3; C: 2.45; D: 2.17 +/- 0.08%; P<0.07). Dietary treatment did not significantly affect the ultimate pH, Japanese color score or CIE L* and b*-values of the loin; however, the CIE a*-value of loins from animals fed diets B and D differed (A: 5.86; B: 6.49; C: 5.81; D: 5.20 +/- 0.23, P=0.0026) from those fed diets A and C. In conclusion, the addition of CMH and dextrose to diets containing 4.5 g/ton Paylean does not significantly improve growth performance; however, the data provide evidence that this dietary addition allows for the repartitioning of nutrients without significantly altering intramuscular fat deposition.

Key Words: Paylean, Creatine, Pigs

545 Fresh pork quality of Rendement Napole and/or Halothane carriers supplemented with magnesium through drinking water. B. R. Frederick*, E. van Heugten, and M. T. See, *North Carolina State University, Raleigh, NC.*

Sixty-four pigs (117±0.7 kg BW) representing 1) non-carriers (NN/rn$^+$rn$^+$), 2) Rendement Napole carriers (NN/RN$^-$rn$^+$), 3) Halothane carriers (Nn/rn$^+$rn$^+$), and 4) carriers of both mutations (Nn/RN$^-$rn$^+$) in a factorial arrangement were individually penned and provided ad libitum access to feed (0.12% Mg) and water. Pigs were randomly allotted to receive 900 mg of Mg/L of drinking water from $MgSO_4$ for 0 or 2 d prior to harvest. Longissimus dorsi (LD) and Semimembranosus (SM) chops were placed on trays, wrapped, and stored at 4°C to simulate display storage for 8 d. Magnesium had no effect on quality characteristics reported. The RN carriers, regardless of the Halothane gene (N_/RN$^-$rn$^+$), had lower (P<0.05) LD color scores (2.2 vs 2.9±0.2), LD pH at 24 h post-mortem (5.59 vs 5.81±0.02), SM pH at 24 h post-mortem (5.68 vs 6.00±0.03), and higher (P<0.05) initial LD Minolta L* (59.3 vs 54.5±0.7), final LD Minolta L* (61.7 vs 57.8±0.07), LD surface exudate (121 vs 98±5 mg), and display fluid loss of LD after 8 d (10.8 vs 7.6±0.4%) than normal rn$^+$ pigs (N_/rn$^+$rn$^+$). Halothane carriers, regardless of the RN gene (Nn/rn$^+$_), had higher (P<0.05) initial LD Minolta L* (58.7 vs 55.1±0.7), final LD Minolta L* (61.4 vs 58.1±0.7), display fluid loss of LD after 8 d (9.8 vs. 8.6±0.4%) and lower (P<0.05) LD color scores (2.2 vs 2.9±0.2) than Halothane normal pigs (NN/rn$^+$_). Interactions between genotypes were present for pH of the LD at 60 min post-mortem (5.89, 6.02, 5.84, and 5.78±0.03), surface exudate of the SM (72, 88, 72, and 112±7 mg), display fluid loss of LD after 4 d (5.7, 7.7, 5.9, and 9.6±0.5%), display fluid loss of SM after 4 d (4.5, 6.8, 4.1, and 8.7±0.6%), and display fluid loss of SM after 8 d (6.7, 9.3, 5.9, and 11.4±0.4%) for genotypes 1, 2, 3, and 4, respectively. Although magnesium did not affect pork quality, the RN and Halothane mutations negatively affected color and fluid loss and effects were much more pronounced in the presence of both mutations.

Key Words: Rendement Napole, Halothane, Magnesium

546 Carcass cutability, belly firmness, and fatty acid composition of Ractopamine supplemented pigs sorted into backfat thickness classes. K. J. Mimbs*[1], T. D. Pringle[1], M. J. Azain[1], and T. A. Armstrong[2], [1]*The University of Georgia, Athens, GA,* [2]*Elanco Animal Health, Greenfield, IN.*

This study was conducted to determine the effect of Ractopamine (RA) feeding on carcass cutability, belly firmness, and fatty acid (FA) composition of pigs varying in prefinishing 10th rib backfat (BF). Crossbred barrows were assigned to a factorial arrangement with two BF classes (fat, F vs lean, L) and two levels of RA (0 vs 10 ppm). Pigs (80 kg) were selected, by ultrasound BF, into L and F pens (difference > .5 cm), and randomly assigned to RA treatment. After finishing (28 d, 18% CP diet, 1.1% lysine), the two average gaining pigs from a pen were harvested (n = 56). Fat samples were collected from subcutaneous (inner surface, SQF), loin i.m., and belly depots. Carcass fat percent (CF) and fat free lean (FFL) percent were calculated and belly thickness and firmness were measured. Data were analyzed using ANOVA for a replicated (n = 4), 2 x 2 factorial arrangement with the main effects of RA and BF and their interactions. Replicate and replicate interactions were included to remove variation. The interaction of RA x BF affected CF (P = .03) with the L-RA, F-RA, and L-C being leaner than the F-C. Weight of FFL was greater in RA vs C (P <.05); however, FFL% was not affected (P >.10) by RA or BF. Belly firmness and FA composition were not affected by RA or BF (P >.10). Linoleic (18.7 vs 17.3%) and linolenic (.80 vs .76%) acid contents from SQF were higher (P <.01) in L vs F pigs, and RA pigs tended to have higher linoleic acid levels than C pigs (18.5 vs 17.6%, P =.07). Palmitic acid from SQF tended to be higher in F vs L and in C vs RA (P = .08). Overall, SQF was more saturated in C vs RA (36.5 vs 35.1%, P = .02). PUFA was higher (P <.01) in L vs F (19.5 vs 18.0%) and tended to be higher in RA vs C pigs (P = .07). Loin i.m. fat had higher oleic acid (45.2 vs 43.4%, P = .05), lower linoleic acid (11.6 vs 13.2%, P = .04), and higher monounsaturated FA (MUFA) content in RA vs C (48.6 vs 46.6%, P = .05). Belly firmness and FA composition were not affected by RA or BF. Furthermore, RA and BF had greater effects on carcass fat content and fatty acid composition than on FFL percent.

Key Words: Pork, Ractopamine, Fatty acids

547 Effects of supplemental corn oil or rumen-protected conjugated linoleic acid on lipid deposition of finished beef cattle. K. R. Smith*, S. K. Duckett, M. H. Gillis, and C. E. Realini, *The University of Georgia.*

Thirty-six Angus-crossed heifers (366 kg) were used to determine the effects of dietary lipid sources on carcass quality, adipose cell diameter and lipid deposition of feedlot cattle. After an initial 56 d feeding period, heifers were allotted to one of three dietary treatments: 1) basal ration containing 88% concentrate and 12% grass hay (CON), 2) basal ration plus 4% corn oil (OIL), or 3) basal ration plus 2% rumen-protected CLA salt (SALT), containing 31% CLA-60. Six heifers per treatment (n=18) were harvested subsequent to a feeding period of either 32d or 60 d. At harvest, SQ and IM adipose tissue samples were collected for cell size determination. At 24 h postmortem, carcass data was obtained and one steak was removed for lipid content and fatty acid composition analysis by GLC. Data were analyzed with treatment, time on treatment, adipose depot and all interactions in the model. OIL fed heifers tended (P = 0.07) to have higher marbling scores than SALT and CON fed heifers. Quality grade and total lipid content of the longissimus did not differ (P > 0.05) by treatment or time. SALT supplemented heifers had 22% greater (P < 0.05) total CLA content than CON or OIL treatments. Corn oil supplementation increased (P < 0.05) linoleic acid concentration in adipose tissue, but did not alter (P > 0.05) level of CLA isomers. SQ depots had a greater (P < 0.05) percentage of cells in the smallest diameter range of 20 to 40 um and the largest diameter range of 160 to 270 um. IM depots had a greater percentage of cells in the mid-diameter range of 60 to 150. CON had a greater (P < 0.05) percentage of cells than SALT in the diameter range of 70 to 90 um; CON tended (P = 0.09) to have a greater percentage than OIL of cells 70 to 80 um and OIL tended (P = 0.10) to have a greater percentage than SALT of cells 80 to 90 um. Lipid supplementation to feedlot diets altered lipid deposition, increased CLA content and altered cellular diameter.

Key Words: Conjugated linoleic acid, Lipid, Beef cattle

548 Comparison of cooking and measuring methods as well as anatomical location on tenderness in M. longissimus dorsi in beef. J. Seenger*[1], Cs. Abrahám[1], G. Holló[2], K. Ender[3], and E. Szücs[1], [1]*Szent István University, Gödöllo-Hungary,* [2]*University of Kaposvár, Kaposvár-Hungary,* [3]*Research Institute for the Biology of Farm Animals, Dummerstorf-Germany.*

The objective of this study was to compare cooking, measuring and sample location effects on tenderness and cooking traits in beef samples taken from M. longissimus dorsi (LD). 27 Holstein-Friesian (HF), 4 German Simmental (GS) and 2 Charolais × Holstein-Friesian (CH × HF) carcasses were chilled for 24 h at 6°C. LD samples were taken between the 9-11th rib. Cuts were removed and cut into six slices (5 × 2.5 cm;1 × 4 cm), vacuum packed, aged (6°C) for 14d and frozen (-25°C). Beginning at the posterior end LD slices were numbered 1 through 6. Slices 1-5 were 2.5 cm, slice 6 was 4 cm thick. Three cooking and measuring methods were applied, as follows: Method I. After thawing, slices 1, 3, and 5 were cooked in water bath to 70 °C internal temperature. Five 1.27 cm-diameter cylindrical cores were removed parallel to the muscle fiber orientation. The Warner-Bratzler (WB) shear force (SF) was determined with Texture Analyzer TA.XT2 instrument using WB attachment. Cores were sheared once with a V shaped 1.2 mm thick blade. Method II. Slices 2 and 4 were grilled to 70 °C internal temperature. The coring and shearing method was the same as in Method I. Method III. Slice 6 was stewed in exsiccator on 160°C for 85 min. One to three, 2.54 cm-diameter cylindrical cores were removed from each slice parallel to the muscle fiber orientation. SF was determined with a Texture Analyzer TA.XT2 instrument. Cores were sheared once with a V shaped 3 mm thick blade. Data were processed by ANOVA and

LSDs. No statistical differences between mean SF value of LD samples treated with Method I (7.32±2.91 kg) or Method II (6.98±2.93 kg) were shown. Method III resulted in higher SF values (15.20±6.22 kg). Cooking, grilling and stewing losses were different. The average of stewing loss was the highest (43.57 %), the average of grilling loss was less (26.95%), and the average of cooking loss was the least (22.r%). Slices from Methods I and II were used to determine the effect of sample location was studied within a slice. The location within a slice seemed to affect SF. As well, the effect of longitudinal location was studied within LD using slices from Methods I and II. A tendency showed that SF is decreased from caudal end to cranial end.

Key Words: Shear force, M. longissimus dorsi, Measuring methods

Nonruminant Nutrition: Energy and amino acids

549 Evaluation of the true ileal digestible (TID) lysine requirement for 7 to 14 kg pigs.

A. M. Gaines*[1], D. C. Kendall[1], G. L. Allee[1], M. D. Tokach[2], S. S. Dritz[2], and J. L Usry[3], [1]*University of Missouri-Columbia, Columbia,* [2]*Kansas State University, Manhattan,* [3]*Ajinomoto Heartland Inc., Chicago.*

A series of experiments were conducted at three different commercial research sites in order to evaluate the true ileal digestible (TID) lysine requirement for 7 to 14 kg pigs. In Exp.1, a total of 840 pigs (PIC 337 × C22; 7.6 ± 0.13 kg) were used in a completely randomized design with 7 replicate pens/treatment and 24 pigs/pen. In Exp. 2, a total of 1,260 pigs (PIC 337 × C22; 8.5 ± 0.14 kg) were used in a completely randomized design with 6 replicate feeders/treatment and 42 pigs/feeder. In Exp. 3, a total of 770 pigs (TR-4 × C22; 7.4 ± 0.07 kg) were used in a randomized complete block design with 7 replicate pens/treatment and 22 pigs/pen. Pigs used in all three experiments were allotted to one of five dietary treatments containing 1.22, 1.32, 1.42, 1.52, and 1.62% TID lysine, respectively. Diets used in the above experiments were formulated to be isocaloric and contained the same inclusion of soybean meal (30%), fat (3%), fish meal, and blood cells. The dietary lysine content was increased by adding L-lysineHCl with additional synthetic amino acids supplied as necessary to meet the minimum amino acid profile. For Exp.1, increasing dietary lysine increased (linear, $P < 0.01$; quadratic, $P = 0.01$) ADG (409, 422, 463, 449, and 440 g/d) and improved (linear, $P < 0.001$; quadratic, $P = 0.001$) G/F (0.756, 0.803, 0.832, 0.793, and 0.823). For Exp. 2, increasing dietary lysine increased (linear, $P = 0.001$; quadratic, $P = 0.02$) ADG (350, 386, 400, 409, and 413 g/d) and improved (linear, $P < 0.001$; quadratic, $P < 0.01$) G/F (0.673, 0.737, 0.753, 0.765, and 0.775). For Exp. 3, increasing dietary lysine increased (quadratic, $P = 0.05$) ADG (409, 427, 427, 422, and 409 g/d) and improved (linear, $P < 0.001$; quadratic, $P < 0.01$) G/F (0.752, 0.790, 0.809, 0.837, and 0.826). Results from these experiments indicate that the TID lysine requirement for 7 to 14 kg pigs may be as high as 1.42%.

Key Words: Lysine, Pigs, Growth

550 Effects of lysine source on growth performance of 11 to 25 kg pigs.

D. C. Kendall*[1], G. L. Allee[1], G. Gourley[2], D. R. Cook[3], and J. L. Usry[4], [1]*University of Missouri-Columbia,* [2]*Swine Graphics Enterprises,* [3]*North American Nutrition Companies, Inc.,* [4]*Ajinimoto Heartland Inc..*

Two experiments were conducted to determine effects of high synthetic amino acid inclusion on growth performance of 11 to 25 kg pigs. Upon placement into the nursery, pigs were allotted by sex in a completely randomized design with three replicate pens per sex and housed at 25 pigs/pen (n=750, Exp. 1) or four replicate pens per sex and housed at 22 pigs/pen (n=880, Exp. 2). Exp. 1 was from 11 to 29 kg and lasted 28 d while Exp. 2 was a 21 d experiment from 11 to 22 kg. The two experiments were conducted at different commercial nurseries with pigs fed nutritionally adequate diets prior to reaching a target weight of 11 kg. Both experiments utilized 5 dietary treatments differing in the inclusion of Lys-HCl (0, 0.12, 0.24, 0.36, and 0.48% Lys-HCl) with all diets containing the same level of lysine (1.32% true ileal digestible [TID] Lys) and energy (3.42 Mcal ME/kg). Dietary lysine content was maintained by adding soybean meal (45, 41.25, 37.5, 33.75, and 30.0%). The 1.32% TID Lys level was determined as the lysine requirement in both facilities from previous experimental results. Additional synthetic amino acids were supplied as necessary to meet minimum amino acid ratio requirements. In Exp. 1, no differences existed for ADG (620, 660, 651, 623, and 640 g/d, respectively), ADFI, or G:F (0.714, 0.727, 0.720, 0.730, and 0.725, respectively) between the dietary treatments. Likewise, in Exp. 2, no differences were detected for ADG (495, 485, 507, 497, and 502 g/d, respectively), ADFI, or G:F (0.783, 0.776, 0.773, 0.784, and 0.777, respectively). These experiments demonstrate that at least 0.48% L-Lysine HCl can be supplemented in diets for 11 to 25 kg pigs, as long as minimum ideal amino acid ratios are maintained.

Key Words: Pigs, Lysine, Nursery

551 Estimation of the ideal ratio of sulfur amino acids:lysine in diets for nursery pigs weighing 11-22 kg.

A. M. Gaines*[1], D. C. Kendall[1], R. W. Fent[1], J. W. Frank[1], G. F. Yi[1], B. W. Ratliff[1], G. L. Allee[1], and C. D. Knight[2], [1]*University of Missouri-Columbia,* [2]*Novus International, St. Louis, MO.*

Two experiments were conducted to evaluate the ideal ratio of sulfur amino acids:lysine (SAA:LYS) for late nursery pigs using two sources of supplemental methionine (DL-methionine vs. Alimet®). For Exp.1, a total of 330 nursery pigs (TR4 × C22; 11.4 ± 0.10 kg) were allotted to one of nine dietary treatments in a randomized complete block design with six replicate pens per treatment. The control diet (Diet 1) was formulated to contain 1.15% true ileal digestible lysine (TID) with no supplemental Alimet® or DL-methionine (49% SAA:LYS). Diets 2-9 consisted of the control diet supplemented with four levels of DL-methionine or Alimet® that corresponded to SAA:LYS ratios of 54, 59, 64, and 69%, respectively. For Exp. 2, a total of 341 nursery pigs (Genetiporc; 12.8 ± 0.56 kg) were allotted to one of six dietary treatments in a randomized complete block design with six replicate pens per treatment. The control diet (Diet 1) was formulated to contain 1.05% TID lysine with no supplemental DL-methionine (49% SAA:LYS). Diets 2-5 consisted of the control diet supplemented with four levels of DL-methionine that corresponded to SAA:LYS ratios of 54, 59, 64, and 69%, respectively. To evaluate the effect of methionine source on growth performance, a 59% SAA:LYS diet was also formulated using Alimet®. In Exp.1, increasing the SAA:LYS ratio increased (quadratic, $P = 0.09$) ADG (472, 500, 509, 500, and 495 g/d) and improved (quadratic, $P = 0.02$) G/F (0.627, 0.650, 0.669, 0.677, and 0.663). There was no effect of methionine source ($P > 0.34$) and (or) methionine source × SAA:LYS interactions ($P > 0.89$) for ADG, ADFI, or G/F (Diets 2-9). In Exp. 2, increasing the SAA:LYS ratio increased (quadratic, $P = 0.05$) ADG (605, 642, 631, 636, and 619 g/d) and improved (linear, $P = 0.01$; quadratic, $P = 0.03$) G/F (0.598, 0.617, 0.613, 0.620, and 0.616). There was no effect of methionine source on ADG ($P = 0.16$) or G/F ($P = 0.28$). Results from these two studies indicate that the ideal ratio of SAA:LYS is as high as 59.0%, regardless of methionine source.

Key Words: Sulfur amino acids, Pigs, Growth

552 Determination of the TID tryptophan:lysine ratio for 90 kg barrows.

D. C. Kendall*[1], B. J. Kerr[2], R. D. Boyd[3], J. W. Frank[1], A. M. Gaines[1], B. Ratliff[1], R. W. Fent[1], and G. L. Allee[1], [1]*University of Missouri-Columbia,* [2]*USDA-ARS-MWA-SOMMRU, Ames, IA,* [3]*The Hanor Company, Spring Green, WS.*

A 29 d experiment was conducted to determine the TID tryptophan:lysine (Trp:Lys) ratio for 91 to 124 kg barrows (n=210, TR4 x PIC C-22). Pigs were allotted in a completely randomized design and fed one of five dietary treatments with six replicates of seven pigs per pen. A four point titration curve was constructed with a basal diet (0.55% TID lys, 3.47 Mcal ME/kg, 9.3% CP) formulated to contain 0.072% TID Trp (0.130 Trp:Lys). Additional amino acids were supplied from synthetic sources to meet minimum ratios. L-Trp was added at the expense of corn, creating the three other Trp:Lys treatments (0.165, 0.200, and 0.235 Trp:Lys). A control corn-soybean meal diet was formulated to contain 0.55% TID lys, 3.47 Mcal ME/kg, 11.7% CP, and 0.110% TID Trp (0.200 Trp:Lys). Blood samples were collected from four pigs/pen at d 0 and d 29 for determination of blood urea nitrogen (BUN). A linear increase in ADG (0.986, 1.11, 1.12, and 1.16 kg/day, respectively; $P< 0.001$) and ADFI ($P< 0.01$) was observed with increasing Trp:Lys for the 29 d trial. There were quadratic improvements in d 29 BW ($P< 0.06$) and G:F (0.304, 0.327, 0.327, and 0.330, respectively;