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;