144 Evaluation of high synthetic lysine diets for 30-52 kg growing gilts reared under commercial conditions. A. M. Gaines*[1], B. W. Ratliff[1], P. Srichana[1], G. L. Allee[1], J. L. Usry[2], G. F. Yi[3], C. D. Knight[3], and K. R. Perryman[3], [1]*University of Missouri,* [2]*Ajinimoto Heartland, LLC,* [3]*Novus International, Inc.*

Two experiments were conducted at a commercial research site in order to evaluate the effects of high synthetic lysine inclusion on the growth performance of growing gilts. In Exp.1, a total of 735 gilts (TR-4 × C22; 32.1 ± 0.15 kg) were used in a RCBD with 7 replicate pens/treatment and 21 pigs/pen (on test 21 d). Pigs were allotted to one of five dietary treatments containing 0.10, 0.20, 0.30, 0.40, and 0.50% added L-Lysine·HCl, respectively. Diets were formulated at a 1.00% true ileal digestible (TID) lysine with supplementation of only L-Thr and Alimet® feed supplement. For Exp.1, diets supplemented with 0.50% L-Lysine·HCl resulted in decreased (Treatment, P < 0.06; Quadratic, P < 0.05) ADG (942, 951, 942, 966, and 907 g/d) and decreased (Treatment, P < 0.01; Linear, P < 0.001) G:F (0.484, 0.476, 0.478, 0.480, and 0.463) compared to diets with 0.10-0.40% L-Lysine·HCl inclusion. In Exp.2, a total of 1,029 gilts (TR-4 × C22; 29.5 ± 0.20 kg) were used in a RCBD with 7 replicate pens/treatment and 21 pigs/pen (on test 23-d). Pigs were allotted to one of six dietary treatments containing 0.10, 0.20, 0.30, 0.40, 0.50, and 0.60% added L-Lysine·HCl, respectively. Diets were formulated at a 1.00% TID lysine and additional L-Thr, Alimet® , L-Trp, L-Ile, and L-Val were supplied as necessary to meet minimum amino acid ratios. For Exp.2, there were no differences in ADG (P=0.21) with increasing L-Lysine·HCl inclusion (935, 948, 922, 929, 942, and 926 g/d). However, diets supplemented with 0.60% L-Lysine·HCl resulted in decreased (Treatment, P< 0.01; Linear, P<0.01) G:F (0.481, 0.481, 0.481, 0.476, 0.475, and 0.468) compared to diets with 0.10-0.40% L-Lysine·HCl inclusion. Collectively, these two experiments indicate that in practical diet formulations, up to 0.40% L-Lysine·HCl can be added with only L-threonine and Alimet® supplementation, whereas up to 0.50% L- Lysine·HCl can be added in diets if supplemented with additional synthetic amino acids. (ALIMET® is a trademark of Novus International, Inc., and is registered in the United States and other countries)

Key Words: Gilts, Lysine·HCl, growth

145 Efficacy of liquid DL-methionine hydroxy analog free acid and DL-methionine as methionine sources for pigs. B. G. Kim[1], M. D. Lindemann*[1], G. L. Cromwell[1], and M. Rademacher[2], [1]*University of Kentucky,* [2]*Degussa AG.*

The replacement rate of liquid DL-methionine hydroxy analog free acid (MHA-FA, 88%) to DL-methionine (DLM, 99%) is a subject of debate. Most of the studies that have been conducted with pigs have involved diets based on cereals other than corn. Thus, the objective of the present study was to evaluate the efficacy of MHA-FA compared with DLM to support N-retention in pigs fed diets based on corn and soybean meal. A total of 30 weanling barrows (mean initial BW of 16.83 ± 0.51 kg) were used in a metabolism study. There were two periods: a 7-d adaptation period and a 5-d collection period for total collection of feces and urine; feed intake was standardized within replicates. The basal diet was formulated to contain 16.85% CP and 0.212% methionine. Dietary treatments included: 1) basal diet, 2) basal plus 0.03% DLM, 3) basal plus 0.06% DLM, 4) basal plus 0.046% MHA-FA, and 5) basal plus 0.092% MHA-FA. The levels of DLM and MHA-FA used were approximated to provide similar methionine equivalents based upon the commercial products used and literature estimates that MHA-FA would have a relative bioequivalence of about 65% on average compared to the DLM. Analysis of the diets for inclusion of the two products demonstrated actual inclusion rates of 0.027 and 0.058% DLM and 0.044 and 0.088% MHA-FA. There was no difference in fecal N output among the treatments (P>0.05). However, urinary N (g) linearly declined (P=0.03 for DLM and P=0.01 for MHA-FA) with increasing amounts of both products. This resulted in a linear increase (P=0.01) in retained N (g/d) for both DLM and MHA-FA (10.96, 11.34, 12.11, 11.35, and 12.12, respectively). Also, N retention rate (%) increased linearly (P=0.01) with increasing levels of DLM and MHA-FA (63.5, 65.8, 69.9, 65.4, and 69.9, respectively). A slope-ratio procedure for comparison of the responses indicated a relative effectiveness on a weight for weight basis for the MHA-FA to DLM of 65.9% for grams of N retained per day and 63.9% for N retention rate.

Key Words: Methionine, Methionine hydroxy analog, Pigs

146 The optimal true ileal digestible (TID) lysine and total sulfur amino acid (TSAA) requirement for finishing pigs fed Paylean®. N. Z. Frantz*, M. D. Tokach, R. D. Goodband, S. S. Dritz, J. M. DeRouchey, J. L. Nelssen, and C. L. Jones, *Kansas State University.*

A total of 1,887 pigs (PIC 337 C22; 97 kg initial BW) were used in a 28-d growth assay to simultaneously examine both the TID lysine and TID TSAA requirements and to determine the appropriate TID TSAA:lysine ratio in finishing pigs fed Paylean (5 ppm). Four TID lysine (0.66. 0.79, 0.92, and 1.05%) and four TID TSAA (0.47, 0.52, 0.57, and 0.63%) concentrations were evaluated. Lysine treatments were formulated with a minimum TID TSAA:lysine ratio of 60%, and TSAA diets were formulated with 1.05% TID lysine. The highest lysine and TSAA concentrations were combined in the same diet, which gave a total of 7 diets. There were eleven or twelve replications per treatment. No gender treatment or treatment week interactions were observed (P > 0.13). Increasing TID lysine improved (linear, P < 0.01) ADG (0.94, 0.97, 1.01, and 1.02) with the greatest response at 0.92% TID lysine. Increasing TID TSAA did not influence (P > 0.76) ADG (1.02, 1.02, 1.02, and 1.02 kg/d) resulting in a TID TSAA:lysine ratio of not more than 51% for ADG. Increasing TID lysine did not affect ADFI (P > 0.60), but ADFI decreased (linear, P < 0.04) with increasing TID TSAA. Increasing TID lysine and TSAA linearly (P < 0.01 and P < 0.09, respectively) improved G:F (0.332, 0.341, 0.354, and 0.359 for lysine and 0.346, 0.355, 0.357, and 0.359 for TSAA). The greatest improvement in G:F was observed as TID lysine increased to 0.92% and TID TSAA increased from 0.47% to 0.52%, resulting in an optimum TID TSAA:lysine ratio of 57%. Regression analysis indicates that the maximum G:F response was obtained with a TID TSAA:lysine ratio of 58%. Increasing TID lysine had no effect on any carcass criteria (P > 0.11), but increasing TID TSAA from 0.47 to 0.52% tended to improve fat free lean (quadratic, P < 0.10). In summary, a TID TSAA:lysine ratio of 58% optimized growth performance of finishing pigs fed Paylean®.

Key Words: Lysine, Methionine, Paylean

147 Evaluation of the true ileal digestible (TID) total sulfur amino acid (TSAA) to lysine ratio for finishing pigs weighing 33 to 60 kg. K. R. Lawrence*, C. N. Groesbeck, R. D. Goodband, M. D. Tokach, S. S. Dritz, J. M. DeRouchey, J. L. Nelssen, and C. R. Neill, *Kansas State University.*

The objective of this trial was to evaluate the true ileal digestible (TID) total sulfur amino acid (TSAA) to lysine requirement for early finishing pigs. A total of 126 pigs (PIC L326 x L42; initially 33.1 kg) were blocked by sex and weight and allotted to one of nine dietary treatments in a 27 d trial. There were two pigs per pen with 4 replicates of barrows (initially 33.7 kg) and 3 replicates of gilts (initially 32.3 kg). Dietary treatments included five TID lysine (0.79, 0.87, 0.94, 1.02 and 1.10%) and five TID TSAA (0.53, 0.57, 0.61, 0.66 and 0.70%) concentrations. The highest lysine (1.10%) and TSAA (0.70%) were combined in one diet and used in both the lysine and TSAA titrations. All experimental diets were corn-soybean meal-based. In diets evaluating increasing TID lysine, methionine & cysteine ratios were 64 to 66% of lysine and in diets evaluating TSAA, diets were formulated to 1.10% TID lysine. Increasing TID lysine increased ADG (linear, P<0.01) and improved G:F (quadratic, P<0.03) with the greatest response at 1.02% TID lysine. Increasing TID lysine had no effect (P>0.05) on ADFI. Increasing TID TSAA had no effect (P>0.05) on ADG or ADFI. There was a linear trend (P<0.15) for an improvement in G:F maximized at 0.61% TID TSAA. Using a TID lysine requirement of 1.02% and TID TSAA requirement of 0.61% suggests a total sulfur amino acid to lysine ratio of 60%. Using the response surface for G:F suggests a similar TID TSAA:lysine ratio of 59%.