lower urine pH (P < 0.0001) and blood urea nitrogen (BUN; P < 0.0001). Urine pH was greater (P < 0.05) and 24 hour urine volume (P = 0.0003) was lower in barrows that received RAC than controls. During P5 and P6, barrows that received CAA had a lower urine pH (P = 0.0002), blood pH (P = 0.05), BUN (P < 0.0001), and chloride concentrations (P = 0.003), and higher sodium concentrations (P = 0.01) and partial pressure carbon dioxide (PCO_2; P < 0.02) than barrows that received HP. Barrows that were supplemented with $NaHCO_3$ had a greater urine pH (P = 0.004), blood pH (P = 0.01), base excess (P < 0.0001), bicarbonate concentrations (P < 0.0001), TCO_2 (P < 0.0001), and Na concentrations (P = 0.01) than barrows that were not supplemented with $NaHCO_3$. These results indicate that the crystalline amino acid diets in both the control and RAC-fed pigs were acidogenic and that the addition of 2.5% $NaHCO_3$ reversed this acidogenesis. Ractopamine reduced urine volume but had minimal effects on acidogenesis.

Key Words: Swine, Diet, Acidogenesis

199 Comparison of crystalline amino acid additions to swine diets containing yellow dent and NutriDense corn. C. W. Hastad*[1], R. O. Gottlob[1], S. K. Linneen[1], M. D. Tokach[1], S. S. Dritz[1], R. D. Goodband[1], J. L. Nelssen[1], J. L. Snow[2], and C. M. Peter[2], [1]*Kansas State University*, *Manhattan*, [2]*ExSeed Genetics L.L.C.*, *Owensboro, KY*.

Three experiments were conducted to determine the amount of L-lysine HCl, L-threonine, and DL-methionine that could be used in diets with yellow dent (YD) or NutriDense (ND) corn before another amino acid became limiting. Treatments were arranged as factorials with L-Lysine HCl (0.15, 0.25, 0.35, or 0.45% in Exp 1; 0.15, 0.3, 0.45 in Exp 2 and 3) replacing soybean meal in diets with YD or ND corn. L-threonine and DL-methionine were added to maintain minimum ratios in all diets with less of these amino acids required in ND diets. In Exp 1, 360 pigs (15.8 kg) were used in a 16-d trial with 5 pigs/pen and 9 pens/treatment. Gain:feed was reduced (0.63, 0.63, 0.61, 0.59; quad, P<0.02) as L-lysine HCl increased. Pigs fed ND corn had greater (P<0.01) G:F than pigs fed YD corn (0.63 vs 0.60). In Exp 2, 1,189 pigs (39.8 kg) were used in a 28-d trial with 28 pigs/pen and 7 pens/treatment. Increasing L-lysine HCL linearly (P<0.01) reduced ADG (867, 866, 817 g/d) and G:F (0.44, 0.43, 0.41) with no interaction (P>0.26) between corn sources. Pigs fed ND corn had greater (P<0.05) ADG (867 vs 833 g/d) and G:F (0.44 vs 0.43) than pigs fed YD corn. In Exp 3, 1,136 pigs (85.0 kg) were used in a 28-d trial with 27 pigs/pen and 7 pens/treatment. Increasing L-lysine HCl reduced ADG to a greater extent (interaction, P<0.03) in YD (828, 772, 521 g/d) than in ND diets (822, 799, 629 g/d). A similar interaction (P<0.01) was found with G:F reducing more quickly for YD (0.32, 0.31, 0.23) than ND diets (0.32, 0.31, 0.27) as the three amino acids were added. Because ND has higher tryptophan and other amino acids relative to lysine, higher levels of L-lysine HCl as well as lower amounts of L-threonine and DL-methionine can be used before another amino acid becomes limiting.

Key Words: Pigs, Corn hybrids, Amino acids

200 The optimal true ileal digestible lysine and sulfur amino acid requirement for nursery pigs between 10 and 20 kg. J. D. Schneider*[1], M. D. Tokach[1], S. S. Dritz[1], R. D. Goodband[1], J. L. Nelssen[1], J. M. DeRouchey[1], G. F. Yi[2], K. R. Perryman[2], and C. D. Knight[2], [1]*Kansas State University*, *Manhattan*, [2]*Novus International Inc.*, *St. Louis, MO*.

An experiment involving 360 pigs (PIC, initial BW = 10.0 kg) was conducted to determine the appropriate true ileal digestible (TID) lysine and sulfur amino acid (SAA) requirement of nursery pigs, and consequently to determine the optimal TID SAA:lysine ratio. This trial was organized as a combination of two simultaneous experiments with one set of diets consisting of five increasing TID lysine levels (1.05, 1.15, 1.25, 1.35, and 1.45%) and the second set of diets consisting of five increasing TID SAA levels (0.61, 0.69, 0.76, 0.83, and 0.90%). Increasing TID SAA was satisfied by supplementing ALIMET® with 88% L-Met activity. The highest level of both lysine and SAA (1.45% and 0.90%, respectively) was combined as one diet and used for both the lysine and SAA titrations to give a total of 9 treatments. Pigs were randomly allotted to eight replications with five pigs per pen based on initial BW. ADG and G:F improved (quadratic, P < 0.01) with increasing TID lysine. The largest increase in ADG and G:F occurred as the TID lysine increased from 1.05 to 1.25%, respectively with little improvement thereafter. Increasing TID SAA increased (quadratic, P < 0.01) ADG and improved (quadratic, P < 0.01) G:F, and the largest improvement in ADG and G:F occurred as TID SAA increased from 0.61 to 0.76%. Interpretation of the response surface resulted in an estimate TID SAA to lysine ratio range of approximately 55 to 61%. ®ALIMET is a trademark of Novus International, Inc. and is registered in the United States and other countries.)

Table 1.

	TID Lysine, %							
Item	1.05	1.15	1.25	1.35	1.45	SE	Linear	Quadratic
ADG, g	484	535	543	541	550	26.66	0.01	0.01
ADFI, g	763	794	778	758	768	16.47	0.45	0.28
Gain/Feed	0.64	0.69	0.71	0.72	0.73	0.008	0.01	0.01
Item	0.61	0.69	0.76	0.83	0.90	SE	Linear	Quadratic
ADG, g	510	537	563	558	550	26.66	0.01	0.01
ADFI, g	762	760	782	767	768	16.47	0.59	0.44
Gain/Feed	0.68	0.72	0.73	0.74	0.73	0.008	0.01	0.01
Gain/Feed	0.68	0.72	0.73	0.74	0.73	0.008	0.01	0.01

Key Words: Lysine, Sulfur amino acids, Nursery pigs

201 Determining the optimal lysine:calorie ratio for growth performance of 10 to 25 kg nursery pigs. J. D. Schneider*, M. D. Tokach, S. S. Dritz, R. D. Goodband, J. L. Nelssen, and J. M. DeRouchey, *Kansas State University*, *Manhattan*.

Two studies were conducted to evaluate the effects of increasing dietary lysine and energy density on performance of PIC nursery pigs. Experiment 1 was organized as a combination of two simultaneous experiments with one set of diets consisting of five treatments with increasing true ileal digestible (TID) lysine (1.11, 1.19, 1.26, 1.34, and 1.42%) and the second set of diets consisting of five treatments with increasing energy density (2,956, 3,103, 3,251, 3,399, and 3,547 kcal/kg). The highest level of both lysine and energy density (1.42% and 3,547 kcal/kg, respectively) was combined as one diet for a total of 10 treatments. Pigs (BW = 9.3 kg) were randomly allotted to eight replications with