Although the maintenance requirement for threonine may increase during growth, its contribution to the total threonine requirement and the thr:lys ratio is relatively small.

**Key Words:** Pigs, Threonine, Growth

## 152 The optimal true ileal digestible (TID) lysine and threonine requirement for finishing pigs from 36 to 60 and 77 to 105 kg

The optimal TID threonine:lysine ratio for finishing pigs. In Exp. 1, four TID lysine and threonine requirements were determined, and a TID threonine:lysine ratio for finishing pigs in Exp. 1, four TID lysine (0.71, 0.81, 0.91, and 1.01%), and five TID threonine (0.50, 0.56, 0.62, 0.68, and 0.74%) levels were evaluated. In Exp. 2, four TID lysine (0.56, 0.64, 0.72, and 0.80%), and five TID threonine (0.43, 0.48, 0.53, 0.58 and 0.63%) levels were evaluated. The diet with the highest lysine and second highest threonine was combined as one diet to give a total of nine diets in each study. In Exp. 1, increasing TID lysine increased ADG (quadratic, \( P < 0.06 \), with the greatest response occurring from 0.71 to 0.81%. Increasing TID lysine also increased ADFI (quadratic, \( P < 0.05 \)) up to 0.81% TID lysine and improved G:F (linear, \( P < 0.01 \)). Increasing TID threonine did not affect ADG (\( P > 0.69 \)) or ADFI (\( P > 0.05 \)), but improved G:F (linear, \( P < 0.05 \)), with the maximum response at 0.68% TID threonine. Values of 1.01% lysine and 0.68% threonine suggest an optimal TID threonine:lysine ratio of 67% for G:F. In Exp. 2, a treatment-gender interaction (\( P < 0.02 \)) was observed for G:F. Gilts had a greater response to increasing TID lysine, whereas barrows had a greater response to increasing TID threonine. Increasing TID lysine improved ADG (linear, \( P < 0.05 \)) in gilts and barrows (\( P < 0.07 \), and increased G:F (linear, \( P < 0.01 \)) in gilts as lysine increased to 0.72%. Increasing TID threonine improved ADG and G:F (linear, \( P < 0.04 \)) in barrows and improved ADG and ADFI (linear, \( P < 0.06 \)) in gilts as the threonine increased to 0.48%. Values of 0.72% TID lysine and 0.48% TID threonine suggest an optimal TID threonine:lysine ratio of 67%. The TID threonine:lysine ratio suggested by this study for pigs from 36 to 60 and 77 to 105 kg is 67%.

**Key Words:** Finishing pigs, Lysine, Threonine

## 153 True digestibility of amino acids in raw and heat-treated soy products: comparison of values obtained with cannulated pigs, cecotomized roosters, and in vitro IDEA™

The objective of this study was to determine if partial replacement of soybean meal with meat and bone meal decreased (linear, \( P < 0.07 \)) ADG and ADFI; however, the greatest decrease in ADFI was observed in pigs fed less than 5.0% meat and bone meal, respectively. Increasing meat and bone meal also improved (quadratic, \( P < 0.01 \)) ADG and G:F, while feeding greater than 5.0% resulted in ADG similar to that of pigs fed the control diet. Overall, ADG was 0.99, 1.08, 1.05, 1.01, 1.02, and 0.99 kg for pigs fed 0, 2.5, 5.0, 7.5, 10.0, and 12.5% meat and bone meal, respectively. Increasing meat and bone meal also improved (quadratic, \( P < 0.01 \)) ADFI as compared to pigs fed the control diet. Overall, G:F was 0.33, 0.35, 0.34, 0.34, 0.34, and 0.34 for pigs fed 0, 2.5, 5.0, 7.5, 10.0, and 12.5% meat and bone meal, respectively. Increasing meat and bone meal decreased (linear, \( P < 0.02 \)) ADFI, however, the greatest decrease in ADFI was observed in pigs fed less than 5.0% meat and bone meal. Because the diets were formulated slightly below the pigs' anticipated requirements, the results suggest that the meat and bone meal used in this study was relatively high quality and had greater amino acid digestibility than expected. In conclusion, replacing a portion of soybean meal with meat and bone meal had no negative effects on pig performance.

**Key Words:** Finishing Pigs, Meat and Bone meal

## 154 Effects of increasing meat and bone meal on finishing pig growth performance

A total of 156 finishing pigs (initially 49.9 kg) were used to determine the effects of increasing porcine meat and bone meal on finishing pig growth performance. Pigs were blocked by initial weight and sex, and allotted to one of six dietary treatments. There were two pigs per treatment. Trial duration was 67 d. The dietary treatments were corn-soybean meal-based and formulated on a true ileal digestible (TID) lysine basis, and fed in three phases. In each phase, diets contained 0, 2.5, 5.0, 7.5, 10.0, and 12.5% porcine meat and bone meal. The diets were formulated to 0.85, 0.70, and 0.57% TID lysine in phases 1, 2, and 3, respectively, slightly below the pigs' anticipated requirements, so that if the amino acid digestibility of meat and bone meal was different than typical values, changes in growth performance could be observed. A TID of 80% (NRC, 1998) for meat and bone meal was used in diet formulation. Adding 2.5 or 5.0% meat and bone meal increased (quadratic, \( P < 0.02 \)) ADG, while feeding greater than 5.0% resulted in ADG similar to that of pigs fed the control diet. Overall, ADG was 0.99, 1.08, 1.05, 1.01, 1.02, and 0.99 kg for pigs fed 0, 2.5, 5.0, 7.5, 10.0, and 12.5% meat and bone meal, respectively. Increasing meat and bone meal also improved (quadratic, \( P < 0.01 \)) ADFI as compared to pigs fed the control diet. Overall, G:F was 0.33, 0.35, 0.34, 0.34, 0.34, and 0.34 for pigs fed 0, 2.5, 5.0, 7.5, 10.0, and 12.5% meat and bone meal, respectively. Increasing meat and bone meal decreased (linear, \( P < 0.02 \)) ADFI, however, the greatest decrease in ADFI was observed in pigs fed less than 5.0% meat and bone meal. Because the diets were formulated slightly below the pigs’ anticipated requirements, the results suggest that the meat and bone meal used in this study was relatively high quality and had greater amino acid digestibility than expected. In conclusion, replacing a portion of soybean meal with meat and bone meal had no negative effects on pig performance.

**Key Words:** Finishing pigs, Lysine, Threonine

## 155 Portal appearance of amino acids in growing pigs fed diets containing crystalline amino acids as partial replacement for protein-bound amino acids

The results indicated that there were strong correlations of IDEA assay with true ileal AA digestibility determined in swine (\( r^2 = 0.86 \) to 0.99). Results of this study indicated that AA digestibility obtained by the precision-fed cecotomized rooster assay provides good predictor of soy product protein digestibility in growing pigs. Results also demonstrated that the SBM IDEA kits can be used as a rapid and inexpensive predictor of soy product in vivo true AA digestibility for swine and poultry, and may be applied as a QC tool for feed manufacturers. (TIDE is a trademark of Novus International, Inc.)

**Key Words:** soy product, true amino acid digestibility, IDEA assay

## 156 Portal appearance of amino acids in growing pigs fed diets containing crystalline amino acids as partial replacement for protein-bound amino acids

The results indicated that there were strong correlations of IDEA assay with true ileal AA digestibility determined in swine (\( r^2 = 0.79 \) to 0.98) and true AA digestibility determined by cecotomized roosters (\( r^2 = 0.86 \) to 0.99). Results of this study indicated that AA digestibility obtained by the precision-fed cecotomized rooster assay provides good predictor of soy product protein digestibility in growing pigs. Results also demonstrated that the SBM IDEA kits can be used as a rapid and inexpensive predictor of soy product in vivo true AA digestibility for swine and poultry, and may be applied as a QC tool for feed manufacturers. (TIDE is a trademark of Novus International, Inc.)

**Key Words:** Amino acid, Portal, Pig