Table 1. Effect of dietary standardized ileal digestible (SID) Trp:Lys ratios on growth performance, daily Trp intake, and plasma urea nitrogen in growing pigs[1]

Item, %	Corrected SID Trp:Lys,%					SEM	Polynomial contrasts	
	15	18	20	23	24		Linear	Quadratic
Initial body weight, kg	26.41	26.30	26.32	26.38	26.21	0.80	-	-
Final body weight, kg	33.90	37.74	38.81	41.10	39.63	1.14	<0.001	0.001
Average daily gain, g	357	545	594	680	639	37.56	<0.001	<0.001
Average daily feed intake, g	968	1,237	1,288	1,349	1,357	56.14	<0.001	<0.001
Gain:feed ratio	0.37	0.44	0.46	0.46	0.45	0.02	<0.001	<0.001
Daily Trp intake, g	12.60	21.02	27.05	33.72	39.35	1.21	<0.001	0.256
Plasma urea nitrogen, mg/dL	11.87	6.43	7.62	7.43	7.14	0.59	<0.001	<0.045

[1]Each least-squares mean represents 8 pens replicates per treatment.

Keywords: distillers dried grains with solubles, performance, tryptophan

165 Effects of Digestible Lysine Level on Growth Performance and Economics of Grow-finish Pigs.

Larissa L. Becker[1], Emily E. Scholtz[2], Joel M. DeRouchey[3], Mike D. Tokach[3], Jason C. Woodworth[3], Robert D. Goodband[4], Jordan T. Gebhardt[5], Jon A. De Jong[2], Fangzhou Wu[2], Kiah M. Gourley[2], Casey R. Neill[2], *[1]Kansas State University, [2]Pipestone Nutrition, [3]Department of Animal Sciences & Industry, College of Agriculture, Kansas State University, [4]Department of Animal Sciences & Industry, Kansas State University, [5]Department of Diagnostic Medicine & Pathobiology, College of Veterinary Medicine, Kansas State University*

A total of 2,124 barrows and gilts (PIC 1050´DNA 600, initially 48.9 kg) were used in a 32-d study to determine the optimal dietary standardized ileal digestibility (SID) Lys level in a commercial setting. Pigs were randomly allotted to 1 of 5 dietary treatments with 24 to 27 pigs/pen and 16 replications/treatment. Similar number of barrows and gilts were placed in each pen. Diets were fed over 3 phases (48.9 to 58.6, 58.6 to 70.9, and 70.9 to 80.8 kg respectively). Dietary treatments were corn-soybean meal-based and contained 10 (phase 1 and 2) or 5% (phase 3) distillers dried grains with solubles. Diets were formulated to 85, 95, 103, 110, or 120% of the current Pig Improvement Company (PIC, Hendersonville, TN) SID Lys gilt recommendations with phase 1 SID Lys levels of 0.90, 1.01, 1.09, 1.17 and 1.27%, phase 2 levels of 0.79, 0.87, 0.94, 1.03, and 1.10%, and phase 3 levels of 0.71, 0.78, 0.85, 0.92, and 0.99%, respectively. Dose response curves were evaluated using linear (LM), quadratic polynomial (QP), broken-line linear (BLL), and broken-line quadratic (BLQ) models. For each response variable, the best-fitting model was selected using the Bayesian information criterion. Overall (d 0 to 32), increasing SID Lys increased (linear, P< 0.001) BW, ADG, G:F, Lys intake/d, and Lys intake/kg of gain. Modeling margin over feed cost (MOFC), BLL and QP estimated the requirement at 105.8% and 113.7% respectively. In summary, while growth increased linearly up to 120% of the PIC current feeding level, the optimal MOFC was 106% to 114% depending on the model used.

Table 1. Effects of increasing SID Lys on grow-finish pig performance[1]

	SID Lys, %						Probability, *P* <	
Item	85	95	103	110	120	SEM	Linear	Quadratic
BW, kg								
d 0	49.0	49.0	49.0	48.9	48.8	0.60	0.744	0.926
d 32	79.0	80.0	81.3	81.9	82.1	0.85	<0.001	0.342
d 0 to 32								
ADG, kg	0.938	0.964	1.008	1.030	1.037	0.017	<0.001	0.191
ADFI, kg	2.376	2.336	2.400	2.382	2.378	0.034	0.547	0.985
G:F, g/kg	394	412	421	434	437	3.8	<0.001	0.074
Lys intake g/d	18.9	20.4	22.9	24.6	26.5	0.41	<0.001	0.923
Lys intake g/kg gain	20.1	21.2	22.8	23.9	25.5	0.28	<0.001	0.292

[1]BW = body weight; ADG = average daily gain; ADFI = average daily feed intake; G:F = gain-to-feed ratio.

Keywords: finishing pig, growth, SID lysine

164 Effect of Supplemental Dl-met Above Requirement on Performance and Serum Concentration of Amino Acids in Heat Stressed Pigs.

Adriana Morales Trejo[1], Verónica Sánchez[1], Bayron Pérez[1], Lucero R. Camacho[1], J. Caroline González-Vega[2], John K. Htoo[2], Miguel Cervantes[3], *[1]UABC, [2]Evonik Operations GmbH, [3]Universidad Autónoma de Baja California*

The intestinal morphology can be compromised in pigs when exposed to heat stress (HS), partly due to increased production of reactive-oxygen species. Because methionine (Met) functions as intracellular antioxidant, requirement of Met may be increased in HS-pigs. The effect of dietary supplementation with DL-Met above requirement on performance and serum concentration (SC) of free AA in HS-pigs was evaluated. A basal wheat-soybean meal diet was formulated to meet 100% Met requirement with the other indispensable AA exceeding at least 20% their requirement. Sixty individually housed pigs (23.0 ± 2.4 kg BW, 12 pigs/treatment) were randomly assigned to 5 treatments: TN100, thermal-neutral (22.7 °C) housed pigs fed the basal diet; HS100, HS120, HS140, HS160; HS pigs (29.6 to 39.4°C) fed the basal diet supplemented with DL-Met to contain 0, 20, 40, and 60% DL-Met above the requirement, respectively. Pigs had free access to feed and water during the 21-d trial. Blood samples were collected on d18 to analyze the absorptive AA-SC. The effect of ambient temperature (HS100 vs. TN100), as well as the linear and quadratic effects of increasing Met levels in the diets for HS pigs were analyzed. The performance results for the TN100, HS100, HS120, HS140, HS160 pigs were: Average daily gain (ADG), 728, 612, 720, 716, 719 g/d; average daily feed intake, 1.40, 1.34, 1.30, 1.30, 1.29 kg/d; gain:feed, 0.522, 0.474, 0.569, 0.563, 0.562, respectively. The ADG reduced ($P < 0.01$) in HS100 compared with TN100 pigs, but linearly increased in HS-pigs, besides gain:feed ($P \leq 0.05$), in response to DL-Met supplementation. The SC of Ile, Leu, Lys, Phe, and Val were higher in HS100 pigs than in TN100 pigs ($P < 0.05$). Graded supplemental DL-Met in diets for HS-pigs linearly decreased SC of Ile, Leu, and Val ($P < 0.05$), tended to decrease His, Lys, and Thr ($P < 0.10$), and increased Met ($P < 0.01$). In conclusion, HS had negative effect on weight gain; however, it was ameliorated by adding 20% Met above the requirement.

Keywords: pigs, heat stress, methionine, serum amino acids