Standardized Ileal Digestible (SID) threonine:lysine ratio on nursery pigs performance under commercial conditions. A total of 2,262 pigs (PIC 359×Camborough®, 5.7 ± 0.1 kg) were used in a 39-d trial. Pens were assigned to dietary treatments in a randomized complete block based on initial BW and room (13 pens/treatment). Lysine was kept below the requirement to ensure that the Thr:Lys ratio was not underestimated (1.30, 1.30, 1.25, and 1.15% SID Lys for 5.7 to 6.4, 6.4 to 9.1, 9.1 to 12.2, and 12.2 to 18.8 kg, respectively). Dietary treatments were 53, 56, 59, 62, 65, and 68% SID Thr:Lys and were fed throughout the entire study. The levels of zinc oxide in the first and second diet were 1600 and 800 mg/kg, respectively. Diet analysis matched formulated values. Data was analyzed using the MIXED procedure of SAS. Linear and quadratic polynomial contrasts were used to evaluate the dose response effect. BW and room were considered random effects in the models. The NLMIXED procedure was used to evaluate competing models: linear (LN), quadratic polynomial (QP), broken-line linear (BLL), and broken-line quadratic (BLQ). From 0 to 21 d, ADG and G:F increased (linear, $P = 0.016$) with the increase in SID Thr:Lys, whereas ADFI and BW were not statistically affected ($P = 0.236$). From d 21 to 39, G:F increased (quadratic, $P = 0.006$) with the increase in SID Thr:Lys. However, ADG, ADFI, and BW were not statistically different ($P = 0.179$) between treatments. Overall, G:F increased significantly (quadratic, $P = 0.001$) and ADG was not statistically different ($P = 0.103$) as SID Thr:Lys increased, whereas ADFI was not statistically different ($P = 0.236$). Based on the dose-response estimation models with the best fit, the levels that maximized performance were >68% for ADG [LN; (ADG=0.64686 + 0.0014932×SID Thr:Lys)/2.2046] and 65% for G:F [QP; G:F=1/(3.56512–0.0661676×SID Thr:Lys+0.0005089×(SID Thr:Lys)^2)]. In conclusion, formulating diets to 65% SID Thr:Lys should maximize G:F while capturing 99.4% of ADG.

Key Words: Growth performance, Nursery pig, Threonine

311 Determining the Impact of Increasing Standardized Ileal Digestible Lysine for Primiparous and Multiparous Sows during Lactation.

K. M. Gourley*[,1], G. E. Nichols[1], J. A. Sonderman[2], Z. T. Spencer[3], J. C. Woodworth[1], M. D. Tokach[1], J. M. DeRouchey[1], S. S. Dritz[1], R. D. Goodband[1], S. J. Kitt[2], E. W. Stephenson[2], *[1]Kansas State University, Manhattan, KS, [2]Pillen Family Farms, Columbus, NE, [3]DNA Genetics, Columbus, NE*

Two experiments evaluated the effects of increasing standardized ileal digestible (SID) Lys in lactation on sow and litter performance. In Exp. 1, 111 primiparous sows (Line 241; DNA, Columbus, NE) were allotted to 1 of 4 dietary treatments on d 110 of gestation. Dietary treatments included increasing SID Lys (0.80, 0.95, 1.10, and 1.25%). During lactation, there was no evidence for differences in ADFI or sow BW at weaning (d 21), resulting in no evidence for differences in BW loss. However, backfat loss during lactation decreased (linear, P=0.046) as SID Lys increased. There was no evident for differences in litter weaning weight, litter gain from d 2 to weaning, percentage of females bred by d 7 after weaning, d 30 conception rate, farrowing rate, or subsequent litter performance. In Exp. 2, 710 mixed parity sows (Line 241; DNA, Columbus, NE) were allotted to 1 of 4 dietary treatments at d 112 of gestation. Dietary treatments included increasing SID Lys (0.75, 0.90, 1.05, and 1.20%). Sow BW at weaning increased (quadratic, P=0.046), and sow BW loss from d 112 to weaning decreased (quadratic, P=0.01) as SID Lys increased up to 1.05% SID Lys with no improvement thereafter. Sow backfat loss increased (linear, P=0.028) as SID Lys increased. Conversely, longissimus muscle depth loss decreased (linear, P=0.002) as SID Lys increased. Percentage of females bred by d 7 after weaning increased (linear, P=0.047) as SID Lys increased in parity 1 sows, with no evidence for differences in parity 2 or 3+ sows. Litter weight at d 17 and litter gain from d 2 to 17 increased (quadratic, P=0.01) up to 1.05% SID Lys with no improvement thereafter. For subsequent litter characteristics, there was no evidence for differences in total born, percentage born alive, stillborn, or mummies. In conclusion, results indicate that the optimal level of dietary SID Lys required by the sow may vary based on response criteria and parity.

	SID Lys, %				
Exp. 1	0.80	0.95	1.10	1.25	SEM
BW change, kg	-5.1	-5.1	-3.8	-3.4	1.38
Backfat change, mm	-2.5	-2.5	-2.2	-1.7	0.33
Litter ADG d2 to wean, g	2,984	2,959	2,896	2,938	57.3
Exp. 2	0.75	0.90	1.05	1.20	
BW change d112 to wean, kg	-35.7	-31.9	-28.5	-31.6	1.50
Backfat change, mm	-1.4	-2.6	-2.8	-2.6	0.44
Loin depth change, mm	-1.9	-1.0	-0.1	0.5	0.61
Litter ADG d2 to 17, g	2,695	2,704	2,887	2,619	43.4

Key Words: Lactation, Lysine, Sow

312 Lysine Requirement of Lactating Sows - Revisited.

A. Graham*[,1], L. Greiner[1], M. A. D. Goncalves[2], U. A. D. Orlando[2], K. J. Touchette[3], *[1]Carthage Innovative Swine Solutions, LLC, Carthage, IL, [2]Genus PIC, Hendersonville, TN, [3]Ajinomoto Heartland, Inc., Chicago, IL*