

	SID Lysine for lactating gilts, % ^a					SEM
	0.90%	1.03%	1.15%	1.28%	1.40%	
BW, kg						
Initial wt. ^b	5.87	5.88	5.36	5.83	6.23	0.210
Final wt.	138.6	139.8	137.3	138.5	138.4	1.07
ADG, g	714	695	719	665	699	20.1
ADFI, kg	1.82	1.81	1.85	1.74	1.82	0.040
G:F	0.392	0.385	0.388	0.382	0.383	0.020
Carcass G:F	0.305	0.299	0.300	0.302	0.297	0.014
Backfat, mm	13.4	14.8	14.0	13.8	12.9	0.54
Carcass lean ^a , %	57.4	56.9	56.9	57.0	57.3	0.22

^anumber of pens: 0.90% = 8, 1.03% = 7, 1.15% = 9, 1.28% = 8, 1.40% = 8

^bQuadratic, $P < 0.05$.

Quality of Their Progeny. G. Gourley^{*1}, E. Bruder¹, S. Jungst², M. Goncalves², ¹Gourley Research Group LLC, Webster City, IA, ²Genus PIC, Hendersonville, TN

The effects of Standardized Ileal Digestible (SID) lysine (Lys) levels fed to gilts during lactation on their offspring's growth and carcass performance have not been documented in the literature. The objectives of this trial were to determine long-term carryover effects of the SID Lys levels fed to lactating gilts on wean-to-finish performance of their progeny. A sub-sample of 923 pigs (PIC 359 × Camborough, 5.9 ± 0.21 kg) were randomly selected for the study. Lactating gilts were randomly assigned to 1 of 5 SID Lys treatments fed during the lactation period: 0.90, 1.03, 1.15, 1.28, and 1.40%. Pigs were identified to the dietary treatment of their parent gilt by using different colored button tags. Pen was the experimental unit. Two complete litters of the same Lys level were allotted to each pen. Pen weights and feed intake were captured at each phase change and used to calculate efficiency. Pigs were fed common diets that met the NRC (2012) recommendations throughout the wean-to-finish period. Data was fit using the MIXED procedure of SAS[®] (Cary, NC) with Lys level as the main effect. Linear and quadratic responses for the lactating gilts lysine levels were estimated by fitting orthogonal polynomial coefficients for equally spaced

treatments to the least squares means. Initial weight and carcass lean reduced and then increased (quadratic, $P < 0.05$) as SID Lysine for the lactating gilts increased. There were no statistical differences for final weight, ADG, ADFI, G:F, carcass G:F, and backfat between treatments ($P > 0.10$). In conclusion, this study with this sub-sample population does not seem to show any major effects of SID Lys fed to gilts during lactation on offspring growth and carcass performance.

Key Words: gilts, lysine, offspring performance

315 Effects of Increasing Standardized Ileal Digestible Lysine during Gestation on Growth and Reproductive Performance of Gilts and Sows Under Commercial Conditions.

L. L. Thomas^{*1}, L. K. Herd¹, B. D. Goodband¹, S. S. Dritz¹, M. D. Tokach¹, J. C. Woodworth¹, J. M. DeRouchey¹, M. A. D. Goncalves², D. B. Jones³, ¹Kansas State University, Manhattan, KS, ²Genus PIC, Hendersonville, TN, ³Archer Daniels Midland, Decatur, IL

A study was conducted on a commercial sow farm to evaluate the effects of increasing dietary standardized ileal digestible (SID) Lys in gestation on sow growth and piglet birth weight. A total of 971 females (498 gilts, 138 parity 2 and 335 parity 3+ sows; Camborough, PIC, Hendersonville, TN) were group-housed (approximately 275 females/pen) and individually fed with electronic sow feeders (ESF). Scales were located in the alleyway after the feeding stations returning into the pen. Females were moved from the breeding stall to pens on d 4 of gestation and were allotted to 1 of 4 dietary treatments on d 5. Dietary treatments included increasing SID Lys (11, 13.5, 16, and 18.5 g/d). High and low dietary Lys treatments were achieved by changing the amounts of corn and soybean meal and intermediate treatments were created by different blends of each via ESF. Gilts and sows received 2.1 and 2.3 kg/d (5.3 and 5.7 Mcal NE/d) of feed throughout the entire study. Initial BW and backfat were obtained on d 5 of gestation while final BW and backfat were obtained on d 112 of gestation.

	g/d SID Lys				SEM	Probability, $P <$	
	11.0	13.5	16.0	18.5		Linear	Quadratic
Initial BW, kg	187.3	185.8	187.2	187.0	1.92	0.777	0.304
Final BW, kg	232.9	233.4	236.8	239.1	0.76	<0.001	0.205
Initial backfat, mm	14.7	14.7	14.8	14.8	0.26	0.650	0.824
Final backfat, mm	17.3	17.5	17.5	17.5	0.25	0.612	0.657
Total born, n	15.5	15.7	15.5	15.6	0.209	0.993	0.858
Piglet BW, kg	1.28	1.27	1.29	1.28	0.014	0.574	0.972

Individual piglet BW was obtained within 12 h of birth on litters from 928 females. Data was divided into 3 parity groups: 1, 2, and 3+ and analyzed using the GLIMMIX procedure of SAS. There was no evidence for a treatment×parity group interaction for any of the response variables. Final BW at d 112 of gestation increased (linear, $P < 0.001$) as SID Lys increased, but there was no evidence for differences in final backfat. On average, females gained 2.7 mm of backfat throughout gestation. Average total born was 15.6 and average piglet BW was 1.28 kg with no evidence for differences among treatment groups. In conclusion, these results appear to suggest that females gained lean tissue because final BW increased with increasing SID Lys, but final backfat did not change. Increasing SID Lys during gestation did not affect pig birthweight in this study.

Key Words: gestation, gilt sow, lysine

316 Impact of Dietary Protein on Yield and

Composition of Sow Milk. C. K. Højgaard^{*1,2}, T. S. Bruun¹, P. K. Theil², ¹SEGES Danish Pig Research Centre, Copenhagen, Denmark, ²Aarhus University, Tjele, Denmark

The aim of the current study was to determine the effect of increased dietary protein for lactating sows on yield (MY) and composition of milk. A total of 594 sows (parity 1 to 5) were randomly allocated to one of six diets with standardized ileal digestible (SID) CP of 96, 110, 119, 128, 137, and 152 g/kg. The dietary contents of SID Lys, Met+Cys, Thr, and Trp fulfilled Danish recommendations by including crystalline amino acids. The proportion of dietary Leu, Ile, His, Phe, Tyr, and Val relative to Lys increased with dietary CP because of a greater inclusion of soy bean meal. The study was initiated at litter standardization (14 piglets; d 3 postpartum) and was completed at weaning (d 26) when the litter weight was recorded. The ADG of the litter and the average litter size were used to estimate the MY (Hansen et al., 2012). On a subsample of 12 sows per dietary group, milk samples were obtained at day 4, 11, 18, and 25 postpartum. Milk samples were analyzed for lactose, fat, and protein. Milk gross energy (GE) was estimated, using the equation after (Chwalibog, 2008): $GE (MJ/100 g) = 39.8 \times \text{milk fat} + 23.8 \times \text{milk protein} + 16.5 \times \text{lactose}$, in which milk constituents appear in percentage. The experimental design was a complete block design and in the statistical analysis, the individual dietary SID CP concentration of each sow was used. Linear or curvilinear responses were determined for the milk constituents, and estimated MY was analyzed, using linear and linear broken-line models. Litter size at weaning (13.1 ± 0.05 ; $P = 0.62$) was not

affected by the treatment. Estimated MY was affected by parity (12.7 vs. 13.2 kg/day for first vs. multiparous sows; $P < 0.001$), however the maximum was reached at the equal breakpoint (126 g dietary SID protein/kg). Lactose was not affected by treatment ($P = 0.16$), having an average on $5.2 \pm 0.01\%$. Milk protein increased linearly with expanding dietary CP from 4.1% in group 1 to 5.1% in group 6 ($P < 0.001$). Milk fat peaked at 110 g dietary SID protein/kg ($P < 0.05$), and milk GE peaked at 120 g dietary SID protein/kg ($P < 0.05$). In conclusion, a dietary content between 110 and 126 g dietary SID protein/kg was required for maximizing sow MY and milk contents of fat and energy, whereas milk protein increased without reaching a plateau.

Key Words: dietary protein, milk composition, milk yield

317 The Standardized Ileal Digestible Valine:Lysine Requirement in Lactating Sows.

C. Boessen^{*1}, A. Graham¹, L. Greiner¹, B. Knopf¹, K. J. Touchette², M. A. D. Goncalves³, U. A. D. Orlando³, ¹Carthage Innovative Swine Solutions, LLC, Carthage, IL, ²Ajinomoto Heartland, Inc., Chicago, IL, ³Genus PIC, Hendersonville, TN

An experiment was conducted with 430 sows (PIC Camborough) to evaluate the ideal standardized ileal digestible (SID) Val:Lys on sow and litter performance during a 23-d lactation period. The SID Val:Lys ratios measured were based on previously published literature and then values above and below reported values. Sows were randomly allotted within parity block (parity 1, parity 2, and parity 3+) to one of five corn soybean meal based lactation diets formulated to contain different levels of SID Val:Lys (0.50, 0.62, 0.75, 0.88, and 1.00, respectively). All diets were formulated to be isocaloric (3.3 ME Mcal/kg) with 0.95% SID Lys and contained vitamins and minerals that exceeded recommendations (NRC, 2012). Experimental diets were given to sows from 112 d of pregnancy throughout the 23-d lactation period. Litters were standardized within 48 h after farrowing. Sows were fed with the Howema computerized feeding system that mixed the high and low diets to create the intermediate diets, weighed the feed for each sow and then delivered the feed to each individual feeding hopper to record daily sow feed intake during lactation. Data were analyzed as a randomized complete block design using the PROC MIXED procedure of SAS with sow as the experimental unit and treatment as a fixed effect and parity as the random effect. Results were considered significant at $P \leq 0.05$ and considered a trend at $P > 0.05$ and $P \leq 0.10$. Sow ADFI was not significantly different (6.0,