

**097 Effects of standardized ileal digestible valine:lysine ratio on nursery pig performance.** A. B. Clark<sup>1,\*</sup>, M. D. Tokach<sup>1</sup>, S. S. Dritz<sup>1</sup>, K. J. Touchette<sup>2</sup>, M. A. D. GonÁalves<sup>1</sup>, J. M. DeRouchey<sup>1</sup>, R. D. Goodband<sup>1</sup>, J. C. Woodworth<sup>1</sup>, <sup>1</sup>Kansas State University, Manhattan, <sup>2</sup>Ajinomoto Heartland, Inc., Chicago, IL.

A total of 280 pigs (PIC 327 × 1050; initially 6.53 kg BW) were used in a 28-d trial to evaluate the effects of increasing standardized ileal digestible (SID) Val:Lys ratio on nursery pig growth performance. Pigs were weaned at 21 d of age and 5 pigs allotted to each nursery pen according to BW and gender. A common diet was fed for 5 d when pens were assigned to 1 of 7 dietary treatments in a randomized block design with 8 pens per treatment. Experimental diets were fed from d 0 to 14 followed by a common diet from d 14 to 28. The 7 dietary treatments were 50, 57, 63, 68, 73, 78, and 85% SID Val:Lys. A prior experiment demonstrated a Lys requirement of 1.44 and 1.45% SID Lys for ADG and G:F, respectively, for pigs in this facility. Thus, diets were formulated to 1.24% SID Lys to ensure pigs were below the Lys requirement. As SID Val:Lys increased, ADG, ADFI, and G:F increased (quadratic,  $P < 0.05$ ). Growth response variables were fitted using linear and nonlinear dose–response models with pen as the experimental unit and initial BW as a covariate with ADG and G:F fitted using heterogeneous and homogenous residual variance, respectively. Models fit were quadratic polynomial (QP), broken-line linear (BLL), and broken-line quadratic with best fit determined according to Bayesian information criterion. For ADG, the best fitting model was BLL and maximum ADG was achieved with a minimum of 62.9% SID Val:Lys (95% CI: [52.2, 73.7%]). For G:F, the best fitting model was QP [ $0.010294 + 0.017526*(\text{Val:Lys}) - 0.000122*(\text{Val:Lys})^2$ ] using a 6.53-kg initial BW. This resulted in a maximum G:F at 71.7% SID Val:Lys and 99% of maximum achieved at a 64.4% ratio. In summary, the SID Val:Lys requirement ranged from 62.9 to 71.7% depending on the response model.

**Key Words:** amino acids, nursery pigs, valine

**098 Impact of elevated preovulatory estradiol during a fixed-time AI protocol on uterine environment and embryonic survival to Day 16.** E. J. Northrop<sup>1,\*</sup>, J. J. Rich<sup>1</sup>, R. A. Cushman<sup>2</sup>, G. A. Perry<sup>1</sup>, <sup>1</sup>Department of Animal Science, South Dakota State University, Brookings, <sup>2</sup>USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE.

The role of preovulatory estradiol in maternal recognition of pregnancy and embryonic survival has not been well established among beef cows. Our objective was to determine the effects of preovulatory estradiol on regulating the uterine environment from fertilization to maternal recognition of pregnancy. Beef cows/heifers were synchronized with the CO-Synch protocol and AIed (d 0). Blood was collected to determine estradiol (d –2 to 0) and progesterone (d 0 to 16) concentrations. Cows were classified by expression of estrus (estrus and no estrus). Uteri were flushed to collect d 16 embryos nonsurgically (Rep 1;  $n = 29$ ) or following slaughter (Rep 2;  $n = 37$ ). Flush media was analyzed for protein and glucose concentrations. Data were analyzed using the mixed procedure in SAS. There was an effect of estrus, time, and estrus by time ( $P < 0.01$ ) on circulating concentrations of estradiol, with cows in estrus having greater concentrations of estradiol. There was no effect of estrus ( $P = 0.41$ ) or estrus by time ( $P = 0.16$ ) on subsequent circulating concentrations of progesterone. There was no difference in embryo recovery rate between estrus and no estrus animals ( $P = 0.20$ ; 48% vs. 29%) and between replicates ( $P = 0.46$ ; 44% vs. 33%). There were no differences between estrus and no estrus animals for uterine flush protein ( $P = 0.36$ ;  $2222 \pm 513$  vs.  $1547 \pm 525$  mg/mL). However, cows that showed estrus had greater glucose concentrations in uterine flush media ( $P = 0.05$ ;  $51 \pm 1.86$  vs.  $45 \pm 1.92$  mg/dL). Cows in which an embryo was recovered had greater concentrations of protein in the uterine flush ( $P = 0.05$ ;  $2643 \pm 585$  mg/mL) compared to cows in which an embryo was not recovered ( $1126 \pm 463$  mg/mL). There were no differences in uterine flush glucose between cows that did or did not have an embryo recovered ( $P = 0.29$ ;  $47 \pm 2.12$  vs.  $50 \pm 1.70$  mg/dL). In summary, embryo recovery rates and uterine flush protein content did not differ between cows that did or did not exhibit estrus, but uterine flush glucose content was greater in cows that exhibited estrus. There was no difference in uterine flush glucose content between cows that did and did not have an embryo, but uterine flush protein content was

**Table 097.**

Item:	SID Val:Lys, %							SEM	Probability, $P <$	
	50	57	63	68	73	78	85		Linear	Quadratic
d 0 to 14										
ADG, g	190	221	249	249	248	251	238	11.2	0.001	0.001
ADFI, g	331	363	394	388	403	390	386	17.2	0.012	0.030
G:F	0.579	0.613	0.635	0.646	0.614	0.645	0.617	0.0189	0.101	0.039