binding to oviduct cells was reduced by more than half in the three sorted samples compared to the control. When binding of fluoresceinated soluble glycans was investigated, the proportion of sperm that bound bi-SiaLN or suLe^X averaged 81% whereas 42% of sperm bound LacNAc. The glycans bound to sperm in three patterns (pattern A: glycan binding to the apical ridge and post-acrosomal area, pattern B: post-acrosomal binding only, and pattern C: apical ridge binding only). For suLe^X and bi-SiaLN glycans, pattern A was present on 38% of the sperm, pattern B on 29%, pattern C on 20%, and no fluorescence was observed on 12% of sperm from each of the four samples. The percentage of sperm that were motile in the sorted samples was reduced on average by 15% from the unsorted control. However, computer assisted semen analysis did not detect other differences in motility parameters between the sorted and control samples. All samples maintained > 97% acrosome integrity after the sorting process. In conclusion, sperm binding to the complex matrix around oviductal cell aggregates was reduced after sorting but binding to purified soluble fluoresceinated glycans was not different among sperm preparations, probably due to a requirement for higher affinity binding and motility to contact and bind intact oviduct cells. The reduction in sperm fertility observed following sorting may be due to reduced ability to bind the oviduct epithelium.

Key Words: oviduct, sex sorting, sperm
doi: 10.2527/msasas2016-096

097 Effects of standardized ileal digestible valine:lysine ratio on nursery pig performance. A. B. Clark[1,*], M. D. Tokach[1], S. S. Dritz[1], K. J. Touchette[2], M. A. D. GonÁalves[1], J. M. DeRouchey[1], R. D. Goodband[1], J. C. Woodworth[1], *[1]Kansas State University, Manhattan, [2]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*(Val:Lys)– 0.000122*(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
doi: 10.2527/msasas2016-097

098 Impact of elevated preovulatory estradiol during a fixed-time AI protocol on uterine environment and embryonic survival to Day 16. E. J. Northrop[1,*], J. J. Rich[1], R. A. Cushman[2], G. A. Perry[1], *[1]Department of Animal Science, South Dakota State University, Brookings, [2]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 es-

Table 097.

	SID Val:Lys, %								Probability, $P <$	
Item:	50	57	63	68	73	78	85	SEM	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