

ileum ($P < .05$) and colon ($P < .10$) compared to other challenged pigs. Pigs fed AR had a lower prevalence and severity of lesions in the jejunum ($P < .05$), and tended to have reduced total tract lesion length ($P = .11$). No differences in length, severity, or prevalence of lesions were observed in 10D + AR pigs ($P > .15$), but fecal shedding of *L. intracellularis* was reduced on d 14 post-challenge ($P < .05$). No dietary effects on fecal shedding were observed by d 20 post-challenge ($P < .10$). Proportion of cells infected with *L. intracellularis* was reduced when DDGS ($P = .05$) or antimicrobials ($P = .10$) were fed. Dietary inclusion of DDGS may provide some benefit to growing pigs subjected to a moderate ileitis challenge, similar to a currently approved antimicrobial regimen, but not under conditions of a severe *L. intracellularis* challenge.

Key Words: Pig, Ileitis, Distiller's Dried Grains with Solubles

71 Selection for placental efficiency in swine: Genetic parameters and trends. H Mesa*, T.J Safranski, K.M Cammack, and W.R Lamberson, *University of Missouri-Columbia*.

Direct and maternal genetic parameters and trends were estimated using data from two lines divergently selected for three generations on an index that included litter size (LS), birth weight (BW), and placental weight (PW). The index was designed to modify LS through changes in placental efficiency (PE), defined as the ratio of BW: PW. Animal model and MTDFREML procedures were used to estimate direct and maternal genetic effects and their correlations and to compute estimated breeding values (EBV) for BW ($n=1788$), PW ($n=1442$), PE ($n=1442$), and LS ($n=125$). The model included the fixed effects of generation and line, with the addition of parity number for LS and of sex for the other traits. Contemporary group was fitted as an uncorrelated random effect for all traits. Quadratic regression on LS was used as a covariate for BW, PW, and PE. Direct heritability estimates from single-trait models were .02, .21, .09, and .08 for BW, PW, PE, and LS, respectively. Maternal heritability estimates were .39, .38, .29, and .03 for BW, PW, PE, and LS, respectively. Genetic correlations between direct and maternal effects were -.51 and -.20 for PW and PE, respectively, and were outside the parameter space for BW and LS. Direct genetic correlations from two-trait models were .77 for BW and PW, -.27 for BW and PE, -.69 for PW and PE, -.19 for LS and BW, -.78 for LS and PW, and .37 for LS and PE. The GLM procedure of SAS was used to compare EBV lsmeans; the model included generation, line, and replicate within line. Divergence trend in direct EBV was 2.13 1.11 g, 17.12 2.34 g, .12 .02, and .00 piglets per generation for BW, PW, PE, and LS, respectively. At generation three, direct EBV tended to be higher in the upward (H) than the downward (L) selected line for BW (.81 2.05 g vs. -6.19 2.21 g, respectively; $P=.10$), tended to be lower in H than L for PW (-1.48 11.02 g vs. 34.62 11.85 g, respectively; $P=.07$), and were not different for PE ($P=.14$). These results indicate that BW, PW, and PE are susceptible to change by genetic selection, but the magnitude of the divergence observed did not result in detectable differences in LS.

Key Words: Genetic Parameters, Placental Efficiency, Pigs

72 Improvement of pregnancy rate to fixed-time artificial insemination with progesterone treatment in anestrus post-partum cows. C.L. Gasser*, E.J. Behlke, C.R. Burke, D.E. Grum, M.L. Mussard, and M.L. Day, *The Ohio State University*.

Potential for pregnancy in anestrus cows requires elevation of progesterone concentration (P4) before ovulation. Utilization of an intravaginal progesterone-releasing insert (IPI) ensures that elevated P4 occurs in all anestrus cows. The objective of this study was to determine if treating anestrus cows with an IPI prior to synchronized ovulation would increase the pregnancy rate to fixed-time AI (TAI). Blood samples collected from post-partum beef cows ($n = 419$) on d -18 and d -9 (TAI = d 0) were analyzed for progesterone concentration; ovarian ultrasonography was performed on d -9; and cows were categorized accordingly as either estrus-cycling (CYC, $n = 235$) or anestrus (ANES, $n = 184$). All cows in the study received GnRH (100 μ g) on d -9. ANES cows either were not treated (CONT, $n = 111$) or received an IPI (CIDR, $n = 73$) on d -9. All cows in the study were given prostaglandin F₂ α on d -2, at which time the IPI was removed from ANES, CIDR-treated cows. In cows that exhibited estrus at least 24 h before d 0, AI was performed within 12 h (Early AI). In all other cows, TAI was performed on d 0, and those that were not detected in estrus 12 h previously received GnRH at TAI. None of the ANES, CIDR-treated cows exhibited

estrus more than 12 h before TAI, whereas Early AI was performed in 11 and 3% of ANES, CONT-treated and CYC cows, respectively ($P < 0.05$). Conception rate at TAI was greater ($P < 0.05$) in ANES, CIDR-treated (55%) than ANES, CONT-treated cows (39%) and not different than the CYC group (54%). Consequently, pregnancy rate to TAI also was greater in ANES, CIDR-treated (55%) than ANES, CONT-treated cows (35%) and not different than the CYC group (53%). In conclusion, pregnancy rate to TAI was increased with progesterone treatment in anestrus cows through preventing premature estrus and increasing conception rate.

Key Words: Anestrus, CIDR, Synchronization

73 Increasing weaning age improves pig growth performance and profitability in a three-site production system. R.G. Main*, S.S. Dritz, M.D. Tokach, R.D. Goodband, and J.L. Nelssen, *Kansas State University, Manhattan*.

Two trials were conducted to determine the effects of weaning age on growing pig biologic and economic performance in a three-site production system. Trial 2 also evaluated the effects of modifying nursery feed budgets according to weaning age. In trial 1 (2,272 pigs), treatments included weaning litters at 12, 15, 18, or 21 d of age. In trial 2 (3,456 pigs), litters were weaned at 15, 16, 18, 19, 20, or 21 d of age and categorized into three treatments (15.5, 18.5, or 21.5 d of age). In trial 2, pigs in each age group were fed a nursery feed budget classified as more or less complex. Since feed budget did not affect ($P>0.27$) performance, only weaning age effects are presented. Each trial was conducted as a randomized complete block design with four blocks of linked nursery and finishing sites (6 and 10 reps/block in trials 1 and 2, respectively). All wean age treatments were weaned from a 7,300-head sow farm on the same day into the same nursery. Each block remained intact as pigs moved from nursery to finishing site. Costs and revenue were measured for each pen. Increasing weaning age (12, 15, 18, or 21; and 15.5, 18.5, or 21.5 in trials 1 and 2, respectively) improved (linear, $P < 0.03$) wean-to-finish ADG (580, 616, 637, 687 8 g/d; 676, 697, 722 6 g/d), mortality rate (9.4, 7.9, 6.8, 3.6 0.95 %; 3.9, 3.4, 2.5 0.5 %), weight sold per pig weaned (94.1, 100.5, 104.4, 113.1 1.3 kg, 107.6, 111.6, 116.2 1.1 kg), income over costs (\$2.00, 5.11, 7.12, 11.19 0.52/pig; \$7.99, 10.04, 12.46 0.46/pig), and cost per hundred kg sold (\$86.19, 83.24, 81.49, 78.36 0.46; \$80.80, 79.25, 77.50 0.32). The improvements in growth and mortality largely occurred in the initial 42 d after weaning, with smaller growth improvements in finishing. These studies indicate that increasing weaning age up to 21.5 d predictably improves grow-finish throughput (1.80 0.12 kg sold/pig/d of age) and profitability (\$0.89 0.05/pig/d of age) within this three-site production system.

Key Words: Weaning Age, Pigs, Economics

74 Predicting bacterial crude protein production from urinary allantoin in spot samples. R.A. McDonald*, T.J. Klopfenstein, G.E. Erickson, and T.W. Loy, *University of Nebraska-Lincoln, Lincoln, NE*.

A metabolism trial was conducted to determine if allantoin in spot urine samples could be a predictor of bacterial CP (BCP) production in finishing heifers. Three diets, formulated to produce differences in BCP production, were fed to six ruminally fistulated heifers (BW=596 \pm 47 kg) in a 3 x 6 latin rectangle design. The high-moisture corn (HMC) diet was 88.3% HMC, 6.7% cottonseed hulls, and 5.0% dry supplement (DM basis). In the BRAN diet, 20% corn bran replaced HMC. Urea was included at 0.9% of DM in these two diets. In the third diet, urea was removed from the BRAN diet, and soybean meal (SBM) replaced HMC at 7.8% of DM. Periods consisted of 9 d for adaptation and 5 d for collection. Spot urine and fecal grab samples were collected daily (0800, 1100, 1400, and 1700 h), and rumen pH and intake data were monitored continuously. BCP (g/d) production from allantoin excretion (BCP-A) was lower for HMC (750) versus BRAN (962; $P=0.02$) or SBM (909; $P=0.07$). Bacterial efficiency ($P=0.15$) and average pH ($P=0.13$) tended to be lower for HMC (8.8 and 5.44) than BRAN (10.3 and 5.78) and SBM (10.8 and 5.88). Dry matter digestibility ($P=0.08$) was higher for HMC (85.0) than BRAN (81.6) and SBM (80.0) with no difference in digestible DMI ($P=0.45$). Regression analyses suggest that efficiency increased with increasing pH and decreased as time below pH of 5.6 increased. Increasing digestible DMI increased BCP-A with an efficiency of 13.1%. BCP-A followed NRC estimates (BCP-NRC) of BCP.