TH166 Egg shape index in fertility and hatchability of Japanese quail. G. Contreras*, A. Silman, C. B. Castro, J. J. Portillo, and A. Estrada, *Universidad Autónoma de Sinaloa*, *Culiac´n, Sinaloa, México*.

The objective was to determine the effect of egg shape index on fertility and hatchability of Japanese quail. Quails (7 wk old; 120 females and 40 males) were housed in batteries with five levels and four cages per level. The quails were fed with diets containing 20.5 % of CP and 2.9 Mcal of DE/kg at a rate of 35 g per animal/d and feed was offered twice daily at 0800 and 1600 h. 540 eggs were collected during a nine wk period. Based on a length:width proportion, two groups were formed: ovoid (1.28 at 1.38) and redounded (1.18 at 1.27). The eggs were stored for three d at 8° C before incubation. The eggs were disinfected with formaldehyde gas (2X). 60 eggs (30 ovoid and 30 redounded) were put in a metallic rack with equal divisions and placed in an automatic incubator for 14 d at 37.7° C and 60 % relative humidity. At d 15 eggs were removed and placed in a hatching machine. The weights of chicks were recorded at 24 h. The un-hatched eggs were broken to investigate fertility and embryo development. The data were subjected to analysis of variance and means compared by Tukey test ($\alpha = 0.05$). To quantifiy and determine the relationship between shape index and external characteristics, Pearson´s correlation analysis was used. Shape index did not affect ($P > 0.05$) fertility (95.8 %), hatchability (63.5 %) and hatching (56.67 %). Shape index affected ($P<0.01$) the egg weight, egg length and egg width. Ovoid eggs were 2.2 % heavier than redounded eggs (14.41 vs. 14.09 g). There were a positive correlation ($P <0.001$) between shape index and egg weight (0.22) and egg length (0.76), but a negative correlation with egg width (-0.26 and -0.08, ovoid and redounded, respectively). The chicks weight were modified ($P < 0.05$) by egg shape index, whereas the chicks hatched of eggs redounded were 2.64% lighter (9.83 vs. 9.57 g). The difference in birth weight of chicks in this study can be attributed more to the egg weight than shape index. The results indicate that the egg shape index of Japanese quail does not affect the fertility or hatchability during the first nine wk of lay.

Key Words: Shape Index, Japanese Quail, Fertility and Hatchability

TH167 Detection of microRNA in porcine somatic and reproductive tissues. S. L. Pratt*, E. Curry, and H. M. Barton, *Clemson University*.

MicroRNA (miRNA) are present in all mammalian tissues examined to date and are implicated in tissue/cell differentiation, carcinogenesis, and embryonic development. They function by altering the translation efficiency of mRNA. Estimates have been made predicting over 1000 miRNAs are encoded in the mammalian genome, but only 112 porcine miRNA have been identified. Our objective was to verify and/or establish the expression of 6 miRNA in somatic and reproductive tissues including liver, heart, kidney, lung, uterus, oviduct, ovary, corpus luteum and the cumulus oocyte complex (COC). Cycling gilts were sacrificed on d 9 of the estrous cycle (estrus = day 1). Tissues were collected, snap-frozen in liquid nitrogen and stored at -80°C until used for the isolation of miRNA. COC greater than 3 mm were aspirated from ovaries obtained from pre-pubertal gilts at slaughter. Criteria for oocyte selection were a uniform cytoplasm and at least 3 layers of cumulus cells. They were frozen in liquid nitrogen and stored at -80°C. Total cellular RNA (tcRNA) was isolated from porcine tissues using the mirVana miRNA isolation kit (Ambion, Austin, TX). All tcRNA samples were subjected to end-point RT-PCR using the mirVana qRT-PCR miRNA detection kit and primer sets (Ambion, Austin, TX) and products visualized using non-denaturing slab gel electrophoresis. Visible products were subcloned into the pDrive vector (Qiagen, Valencia, CA) and used to transform competent *E. coli*. The plasmid was then isolated and subjected to dideoxy sequencing at the Clemson University Genomics Institute. PCR product was detected for miR-31 in all tissues examined except for the heart and liver. No product for the miR-124a primer set was detected in any tissue examined. Products were observed in all tissues for primer sets for miR-24, 92, 132, and 212. Our data suggest tissue restricted expression of miR-31 and -124a; however, future studies evaluating hormonal/developmental effects on their expression are required. In addition, studies to elucidate the identity of miRNA expressed in porcine reproductive tissues are required.

Key Words: Pig, microRNA, RT-PCR

TH168 Endocrine regulation of colostrum production in primiparous sows. A. Foisnet[1], C. Farmer[2], M. Etienne[1], J. Le Dividich[1], and H. Quesnel*[1], [1]*INRA*, *Saint Gilles, France*, [2]*Agriculture and Agri-Food Canada*, *Sherbrooke, QC, Canada*.

The aim of this experiment was to investigate hormonal changes potentially involved in colostrogenesis in sows. Colostrum production was estimated in 16 LR × LW sows during 24 h starting at the onset of parturition using piglets' weight gains (Devillers et al., 2004). Jugular blood samples were taken daily from day 105 of gestation until 2 days postpartum and were assayed for prolactin, progesterone (P4), estradiol-17β (E2) and cortisol. Lactose concentrations were measured in colostrum at the onset of parturition then 3, 6 and 24 h later. Colostrum production averaged 3.22 ± 0.34 kg. Four sows had a very low colostrum yield (1.10 ± 0.13 kg), while the others produced between 3.00 and 4.80 kg (3.93 ± 0.16 kg). Colostrum production was not correlated ($P > 0.1$) with litter size or litter weight at birth, nor with plasma E2 or cortisol concentrations at any time before farrowing. Colostrum production was correlated with serum prolactin concentrations during the 2 days before parturition (d-2 and d-1) ($r = 0.60$; $P = 0.014$), plasma P4 concentrations on d-1 and d0 (farrowing) ($r = -0.58$; $P = 0.018$) and with P4:E2 ratio on d-1 and d0 ($r = -0.54$; $P = 0.015$). The low producing sows tended to have lower prolactin concentrations on d-2 and d 1 than the 12 medium-to-high producing sows (12.88 ± 2.76 vs. 20.08 ± 1.62 ng/ml; $P = 0.079$) and higher P4 concentrations on d-1 and d0 (8.54 ± 1.53 vs. 5.56 ± 0.57 ng/ml; $P = 0.053$). A negative correlation between P4 concentrations and colostrum production was also observed in the ewe and was attributed to the inhibitory effect of P4 on lactose synthesis (Banchero et al., 2006). In the present study, no correlation was found between plasma P4 concentrations and lactose concentrations in colostrum. Results suggest that impaired colostrum production is due to a hormonal imbalance.

Devillers et al., 2004. Anim. Sci. 78: 305-313; Banchero et al., 2006. Reprod. Nutr. Dev. 46: 447-460.

Key Words: Sow, Colostrum, Endocrine Control

TH169 Maintenance of pregnancy with Matrix® in $PGF_{2\alpha}$-treated sows. C. E. Ferguson*, M. C. Poole, D. M. Gandy, and F. M. LeMieux, *McNeese State University*, *Lake Charles, LA*.

This experiment was conducted to evaluate the effectiveness of Matrix® in maintaining pregnancy post $PGF_{2\alpha}$ administration in swine. Nine crossbred sows (Yorkshire x Landrace) were maintained on gestation diets, naturally mated with a boar of proven fertility and diagnosed pregnant via ultrasonography at approximately 30 d post-mating. All sows received 15 mg of $PGF_{2\alpha}$ (Lutalyse, Pharmacia®) twice at 12 h intervals. Sows were randomly assigned to a control (n = 3) no Matrix® or treatment (n = 6) 30 mg of Matrix® at time of first $PGF_{2\alpha}$ administration. Treatments were administered for 6 consecutive d at 24 h intervals. Matrix® was administered daily via top dressing bread; control sows received bread without Matrix®. Ultrasound was used to determine pregnancy status throughout the experiment. Control sows began to abort within 2 to 3 d following first $PGF_{2\alpha}$ administration and the pregnancy was completely terminated (determined by the absence of viable fetuses and fluid within the uterus during ultrasound scanning) by 3 to 4 d post-$PGF_{2\alpha}$. These females displayed estrus behavior and were mated by a boar following abortion. Sows receiving Matrix® remained pregnant for the entire 7 d Matrix® feeding period. Treatment sows completed the abortion process by 4 d post last Matrix® administration. It was concluded that all sows lacked functional corpora lutea (as result of $PGF_{2\alpha}$ administration) as evidence of all sows aborting in the control and treatment group following cessation of Matrix® administration. These results demonstrate that Matrix® at a dose of 30 mg per head per d can maintain pregnancy in sows at approximately 30 d of gestation treated with a luteolytic dose of $PGF_{2\alpha}$. The significance of this finding is the development of a practical method of maintaining pregnancy in sows by top dressing a feedstuff with an exogenous progestin.

Key Words: Sows, Luteolytic, Progestin

TH170 Defined pattern of Sertoli cell differentiation in pubertal porcine testes. J. J. Ford* and T. H. Wise, *USDA/ARS/USMARC*, *Clay Center, NE*.

Number of Sertoli cells is a primary determinant of mature testicular size and sperm production. In boars, formation of the blood/testis barrier occurs by 4 mo of age in commercial breeds and signals the end of Sertoli cell proliferation. Previous studies established that expression of p27Kip1, a cyclin-dependent kinase inhibitor and a marker of Sertoli cell differentiation, was first detected at 70 d of age and by 90 d was apparent in tubules of most boars; however, its pattern of expression did not appear random. To test if Sertoli cell differentiation occurs in a defined pattern, one testis was removed from 25 crossbred boars at 90 d of age. From each testis, 2 aliquots of tissue were taken adjacent to the tunica and 2 other aliquots were sampled near the mediastinum. Tissues were fixed and embedded. Tissue sampled near the tunica was further divided into 2 regions, one < 1.5 mm and the other > 1.5 mm from the tunica. A minimum of 200 tubules from each of the 3 regions/boar was evaluated for tubule diameter and % with Sertoli cell nuclei positive for p27Kip1 assessed by immunohistochemistry. Mean diameter of seminiferous tubules increased ($P < 0.01$) from 75.9 μm near the tunica to 90.2 μm in the mediastinum, and % of tubules positive for p27Kip1 was greater ($P < 0.001$) near the mediastinum than near the tunica. Tubules within the sub-tunica region were intermediate for both of these traits. Presence of p27Kip1 correlated positively ($P < 0.01$) with mean diameter of tubules within each of the 3 regions. Weight of the second testis at 10 mo of age correlated negatively ($P < 0.03$) with diameter of tubules within the mediastinum at 90 d of age. These findings establish that differentiation of Sertoli cells progresses from the mediastinum toward the tunica thereby implying that proliferation continues for a longer period at the outer region of the seminiferous tubules. Also, 90-d-old boars with testes containing small diameter tubules have a greater compensatory response to unilateral castration than 90-d-old boars with larger diameter seminiferous tubules.

Key Words: Boar, Puberty, Sertoli Cell

TH171 Comparison of domestic and feral pig physiology, immunity and growth. B. L. Davis*[1,2], M. A. Sutherland[1,2], P. J. Bryer[1,2], J. F. Smith[1,2], and J. J. McGlone[1,2], [1]*Pork Industry Institute*, *Lubbock, TX*, [2]*Texas Tech University*, *Lubbock*.

Feral pigs in Texas are descended from introduced European wild pigs and escaped domestic pigs that have established wide-ranging populations. Little is known about the physiological, immune and performance differences between feral and domestic pigs. The objective of this project was to: 1) compare physiological, immune and growth measures between domestic and feral pigs, 2) determine the effect of the circadian rhythm on glucocorticoid secretion in feral and domestic pigs and 3) determine if feral pigs are carriers of common domestic swine diseases. Domestic (n=4) and trapped feral (n=4) pigs of approximately 3 wk of age were used for this comparative study. Body weights were recorded and blood samples were collected over time for analysis of cortisol concentrations, hematology values and immune measures. On day 6, blood samples were taken every 6 h over a 24 h period (0600, 1200, 1800, 2400 h). Cortisol concentrations were higher among feral compared with domestic pigs (111.8 vs. 37.2 ± 13.85 ng/mL, $P<0.01$) and were greater ($P<0.01$) in feral compared with domestic pigs at 0600, 1200, 1800 and 2400 h. The percentage of lymphocytes (56.0 vs. 48.8 ± 1.38 %, $P<0.05$) and mean cell volume (57.0 vs. 52.5 ± 0.69 %, $P<0.005$) were greater among feral compared with domestic pigs. Red blood cell distribution width was lower in feral compared with domestic pigs (18.7 vs. 22.9 ± 0.42 %, $P<0.01$). Innate immune measures did not differ ($P>0.05$) between feral and domestic pigs. Average daily gain was lower in feral compared with domestic pigs (0.1 vs. 0.3 ± 0.04 kg/d, $P<0.01$). Feral pigs tested negative for the Pseudorabies virus, but tested positive for Brucella abortus antibodies. Physiological, immune and growth difference were observed between feral and domestic pigs either due to environmental or genetic differences. Feral pigs were carriers of a swine and human pathogen and could be a potential biosecurity risk for commercial pig farms and human populations.

Key Words: Feral, Physiology, Pigs