

indicate that niacin receptor GPR109A is expressed in bovine embryos produced in vitro. However, addition of niacin to embryo culture did not improve embryo development to the blastocyst stage regardless of whether embryos were exposed to heat shock.

Key Words: niacin, receptor, embryo

TH338 Prepartum body condition score changes and the secretion of acute phase proteins in dairy cows. P. Montagner^{1,2}, E. Schwegler^{1,2}, M. M. Weschenfelder^{1,2}, A. R. Krause^{1,3}, J. Alvarado^{1,2}, A. S. Maffi^{1,2}, C. C. Brauner^{1,3}, A. Schneider^{1,4}, E. Schmitt^{1,2}, E. G. Xavier^{5,2}, C. F. Martins^{1,2}, V. R. Rabassa^{1,2}, F. A. B. Del Pino^{1,3}, and M. N. Correa^{1,2}, ¹Center for Research, Teaching and Extension in Animal Science (NUPEEC), Pelotas, RS, Brazil, ²Department of Clinical Veterinary, Federal University of Pelotas (UFPEL)-BRA, Pelotas, RS, Brazil, ³Department of Animal Science, (UFPEL - BRA), Pelotas, RS, Brazil, ⁴Departament of Nutrition (UFPEL - BRA), Pelotas, RS, Brazil, ⁵Granjas 4 Irmaos, Rio Grande, RS, Brazil, ⁶Center for Agroforestry Research of Rondonia - Embrapa CPAF, Rondonia, RO, Brazil.

The aim of this study was to investigate the effect of body condition (BCS) score changes during the prepartum period on the concentration of acute phase proteins and metabolic parameters in dairy cows. Evaluation of BCS was performed on 20 pregnant Holstein dairy cows (on a 5-point scale with quarter-point divisions), from a commercial herd kept in a semi-extensive system in southern of Brazil. The cows were divided into 2 groups: cows that increased BCS (+0.25) from the third to the first week before the expected calving date (UP-BCS; n = 11) or cows that decreased BCS (-0.8) (LO-BCS; n = 9) in the same time frame. Blood samples were collected from the coccygeal vein on the d 23, 14, 7 and 3 prepartum, on the calving day and at d 3, 6, 9, 16 and 23 postpartum to evaluate the concentrations of nonesterified fatty acids (NEFA), glucose (GLU), albumin (ALB), haptoglobin (Hp) and paraoxonase (PON). Milk yield was recorded daily, and a 5-d average was generated, from 16 to 41 d in milk. Statistical analysis was performed using the SAS software, using the MIXED procedure for repeated measures. Average milk yield was higher for UP-BCS cows ($P < 0.01$; 27.4 kg/d vs. 24.4 kg/d). The UP-BCS cows had higher serum concentration of PON and ALB in the pre and postpartum periods ($P < 0.05$), while the LO-BCS group had higher levels of Hp in both periods ($P < 0.05$). Other variables (GLU and NEFA) were not different between groups ($P > 0.05$). These results indicate that BCS loss in the pre-partum period can affect the pattern of secretion of acute phase proteins in dairy cows in the transition period. In sum, our results indicate that higher BCS loss is associated to increased secretion of HP and reduced secretion of PON and ALB, which can be associated to increased risk of disease development.

Key Words: body condition score, haptoglobin, paraoxonase

TH339 Relationships of birth weight traits with age at first estrus and number of ovulations in Landrace-Duroc-Yorkshire gilts. C. A. Lents*, L. A. Rempel, T. Wise, and D. Nonneman, U.S. Meath Animal Research Center, Agricultural Research Service, United States Department of Agriculture, Clay Center, NE.

Selection for increased litter size has resulted in greater within-litter variation in piglet birth weight and a reduction in litter average birth weight; believed to be associated with intrauterine growth restriction as a result of limitations in uterine capacity. This leads to increased preweaning mortality, reduced growth performance, decreased muscle fiber number and reduced carcass quality. Low birth weight gilts have

more primordial and fewer primary and secondary follicles suggesting that variation in average litter birth weight could negatively affect reproductive traits. The objective of this study was to examine the effects of birth weight traits with age at puberty and number of ovulations in gilts. Age at puberty, the first standing estrus in the presence of a mature boar, was determined for 2,187 gilts beginning at approximately 140 d of age. The number of ovulations for 2,173 gilts was determined during postmortem examination by counting the number of corpora lutea on the ovary after the first or second parity. Partial correlation coefficients for total born, total born alive, litter average birth weight, CV of litter average birth weight, individual birth weight, and deviation of individual birth weight from litter average birth weight with age at first estrus and number of ovulations were estimated using a model that fit season and line as fixed effects and sire as a random effect. Average age at first estrus and number of ovulations was 195.1 ± 0.4 d of age and 16.3 ± 0.1 ovulations, respectively. Litter average birth weight ranged from 0.79 to 2.45 kg with CV ranging from 23.5 to 44.7%. There were no significant correlations for age at first estrus with any of the birth weight traits examined. The number of ovulations was weakly correlated ($r = 0.08$, $P < 0.001$) with individual birth weight but not any of the other birth weight traits. These data do not support the concept that differences in average litter birth weight contributes to variation in pubertal age or ovulation rate in pigs.

Key Words: birth weight, ovulation rate, puberty

TH340 Determining the effect of scrotal insulation on sperm production in the boar. K. M. Gibbs*, J. R. Schindler, and J. J. Parrish, University of Wisconsin-Madison, Madison.

The objective of this study was to develop a model of heat stress in the boar using scrotal insulation to determine which stages of development were most susceptible to damage and apoptotic loss. The experiment utilized sacks that were adhered to the scrotum to produce a localized heat insult. Sacks were either insulated with batting and foil vapor barrier or were of the same design but without insulation material as a sham treatment. Semen was collected and analyzed for motility and total sperm output from the boars on a Monday, Wednesday, and Friday schedule leading up to the treatment and 6 weeks post-treatment. Scrotal sacks, non-insulated or insulated, were adhered to the testes and temperature loggers were attached to the scrotum to measure scrotal temperature over the 48 h treatment period. A significant difference in average temperature was achieved during the treatment between the insulated group (n = 5) and non-insulated group (n = 5) (mean \pm SEM, $33.9 \pm 0.33^\circ\text{C}$ vs. $32.1 \pm 0.43^\circ\text{C}$; $P < 0.05$). Semen samples were evaluated for motility and total sperm output. Motility was determined using computer assisted semen analysis with Hamilton Thorne motion analysis system. The non-insulated group (n = 4) showed no significant difference in motility compared with the control days (mean \pm SEM, $96 \pm 0.52\%$; $P > 0.05$). However, the insulated group (n = 4) showed a significant decrease in motility for d 28,30,33, and 35 compared with the control days (mean \pm SEM, $78 \pm 5.00\%$, $69 \pm 6.76\%$, $66 \pm 11.85\%$, $69 \pm 9.86\%$ vs. $95 \pm 0.89\%$; $P < 0.05$). Total sperm output was not different for the non-insulated group (n = 5) compared with the control days (mean \pm SEM, 35 ± 3 billion; $P > 0.05$). However, there was a trend indicating a decrease in sperm cell output on d 33 for insulated boars compared with the control days (mean \pm SEM, 24 ± 6 billion vs. 35 ± 3 billion; $P = 0.06$). The data suggests that an average temperature increase of 1.8°C of the testes can have damaging effects to boar semen quality. Based on the known spermatogenic timeline in the boar, the main cell stage affected by the scrotal insulation treatment was the primary spermatocyte.

Key Words: semen, heat stress, swine