

Animal Health II

215 The effect of yeast cell wall supplementation on the physiological and acute phase responses of crossbred heifers to endotoxin challenge. N. C. Burdick^{*1}, T. R. Young², J. A. Carroll¹, J. R. Corley³, R. J. Rathmann², and B. J. Johnson², ¹USDA-ARS, Livestock Issues Research Unit, Lubbock, TX, ²Texas Tech University, Department of Animal and Food Sciences, Lubbock, ³Lesaffre Feed Additives, Milwaukee, WI.

This study examined the effect of feeding yeast cell wall (YCW) products on the physiological and acute phase responses (APR) of crossbred newly-received heifers to endotoxin (lipopolysaccharide; LPS) challenge. Heifers ($n = 24$; 219 ± 2 kg) were obtained from commercial sale barns and transported to the Texas Tech University Beef Center in New Deal, Texas. Heifers were separated into treatment groups receiving a Control Diet (C; $n = 8$), YCW A ($2.5 \text{ g} \cdot \text{hd}^{-1} \cdot \text{d}^{-1}$; $n = 8$) or YCW C ($2.5 \text{ g} \cdot \text{hd}^{-1} \cdot \text{d}^{-1}$; $n = 8$) and were group fed for 52d. On d36 heifers were fitted with vaginal temperature (VT) recording devices and jugular catheters and moved into a barn with individual stalls during which they were individually fed. On d37 heifers were challenged i.v. with LPS ($0.5 \mu\text{g}/\text{kg}$ BW) and blood samples were collected every 0.5h from -2 to 8h and again at 24h relative to LPS challenge (0h). Sickness behavior scores (SBS) were assigned following collection of each blood sample. Serum was isolated and stored at -80°C until analyzed for cortisol, interleukin-6 (IL-6), interferon- γ (IFN- γ), and tumor necrosis factor- α (TNF- α). Data were analyzed using the Mixed procedure of SAS specific for repeated measures. There was an increase in VT in all treatments post-LPS ($P < 0.001$), with YCW C ($38.90 \pm 0.03^\circ\text{C}$) maintaining lower VT post-LPS than C ($39.00 \pm 0.3^\circ\text{C}$) and YCW A heifers ($38.99 \pm 0.03^\circ\text{C}$; $P < 0.01$). Post-LPS SBS increased but were not affected by treatment ($P = 0.54$). Cortisol was greatest in C ($39.7 \pm 1.5 \text{ ng/mL}$) heifers post-LPS than YCW A ($31.3 \pm 1.7 \text{ ng/mL}$) or YCW C heifers ($32.0 \pm 1.7 \text{ ng/mL}$; $P < 0.001$). Concentrations of IFN- γ and TNF- α increased post-LPS ($P < 0.001$) but were not affected by treatment ($P = 0.50$ and 0.35 , respectively). Serum IL-6 increased post-LPS ($P < 0.001$) and were greater in C ($351.5 \pm 36.0 \text{ pg/mL}$) than YCW A ($85.8 \pm 42.9 \text{ pg/mL}$) and YCW C ($136.2 \pm 36.0 \text{ pg/mL}$; $P < 0.001$) heifers. These data indicate that YCW supplementation can decrease the physiological and APR of newly-received heifers to endotoxin challenge. Therefore, YCW supplementation may be a viable feed supplement for newly received heifers to reduce the negative effects of illness.

Key Words: cattle, immune, yeast

216 OmniGen-AF supplementation modulates the physiological and acute phase responses of Brahman heifers to an endotoxin challenge. N. C. Burdick^{*1}, J. A. Carroll¹, J. D. Chapman², T. H. Welsh Jr.³, R. C. Vann⁴, and R. D. Randel⁵, ¹USDA-ARS, Livestock Issues Research Unit, Lubbock, TX, ²Prince Agri Products, Inc, Quincy, IL, ³Texas AgriLife Research, Texas A&M System, College Station, ⁴MAFES, Mississippi State University, Raymond, ⁵Texas AgriLife Research, Texas A&M System, Overton.

This study examined the effect of feeding OmniGen-AF (OG; Prince Agri Products) on the physiological and acute phase responses (APR) of heifers to an endotoxin (lipopolysaccharide; LPS) challenge. Brahman heifers ($n = 24$; 183 ± 5 kg) from the Texas AgriLife Research Center in Overton, TX were separated into 2 groups at weaning: 1) Control (C; $n = 12$) and 2) OG ($n = 12$; fed at 4 g per 45.4 kg BW) and fed for 69d. On d35 heifers were fitted with vaginal temperature (VT) monitoring

devices, and were transported from Overton to New Deal, TX on d39. On d40, heifers were fitted with jugular catheters and moved into a barn with individual stalls. On d41 heifers were challenged with LPS ($0.25 \mu\text{g}/\text{kg}$ BW i.v.) and blood samples were collected at 0.5h intervals from -2 to 8 h and again at 24h relative to LPS challenge (0h). Additional blood samples were collected every 2h and analyzed for white blood cell (WBC) counts. Sickness behavior scores (SBS) were assigned following collection of each sample. Serum was isolated and analyzed for cortisol, interleukin-6 (IL6), interferon- γ (IFN γ), and tumor necrosis factor- α (TNF α). Heifers were transported back to Overton on d43. Data were analyzed using the Mixed procedure of SAS specific for repeated measures. Post-LPS VT increased ($P < 0.01$) in all heifers, and was lower in OG ($38.97 \pm 0.01^\circ\text{C}$) than C heifers ($39.03 \pm 0.00^\circ\text{C}$; $P < 0.01$). Post-LPS SBS increased ($P < 0.01$) and were greater in OG (2.34 ± 0.02) than C heifers (2.16 ± 0.02 ; $P < 0.01$). Cortisol increased post LPS ($P < 0.01$) and were greater in OG ($54.8 \pm 1.1 \text{ ng/mL}$) than C heifers ($48.4 \pm 1.1 \text{ ng/mL}$; $P < 0.01$). Pre- and post-LPS WBC and lymphocytes (L) were greater in OG (WBC: 147 ± 4 and 82 ± 2 cells/ μL ; L: 90 ± 3 and 42 ± 2 cells/ μL) than C heifers (WBC: 110 ± 4 and 63 ± 2 cells/ μL ; L: 68 ± 3 and 35 ± 1 cells/ μL ; $P < 0.01$). Total WBC, L, and neutrophils decreased 1 h post LPS ($P < 0.01$). Although post-LPS IFN γ , TNF α and IL6 increased ($P < 0.01$), there was no treatment effect ($P > 0.51$). These data suggest that OG-supplemented heifers were primed to produce a quicker APR to LPS challenge (lower VT, greater WBC counts), allowing for the heifers to recover quicker than C heifers.

Key Words: cattle, immune, OmniGen-AF

217 Yeast cell wall supplementation alters the performance and physiological response of beef heifers following an immune challenge. T. R. Young^{*1}, N. C. Burdick², J. A. Carroll², M. A. Jennings¹, J. T. Cribbs¹, R. J. Rathmann¹, J. R. Corley³, and B. J. Johnson¹, ¹Texas Tech University, Department of Animal and Food Sciences, Lubbock, ²USDA-ARS, Livestock Issues Research Unit, Lubbock, TX, ³Lesaffre Feed Additives, Milwaukee, WI.

A study was designed to determine the effect of feeding yeast cell wall (YCW) products on the performance and vaginal temperature response of crossbred heifers following a subcutaneous endotoxin (lipopolysaccharide; LPS) challenge. Heifers ($n = 83$; 225 ± 9.4 kg) were obtained from commercial sale barns and transported to the Texas Tech University Beef Center in New Deal, Texas, sorted by source ($n = 2$), and arranged in a completely randomized block design (21 pens; 7 pens/treatment; 4 heifers/pen). Heifers were separated into treatment groups receiving a Control Diet (CON; $n = 28$), YCW A ($2.5 \text{ g} \cdot \text{hd}^{-1} \cdot \text{d}^{-1}$; $n = 28$), or YCW C ($2.5 \text{ g} \cdot \text{hd}^{-1} \cdot \text{d}^{-1}$; $n = 27$). On d 56 heifers were fitted with indwelling vaginal temperature (VT) recording devices. Heifers were then challenged subcutaneously with LPS ($0.5 \mu\text{g}/\text{kg}$ BW) on d 63. Daily DMI was recorded and individual BW was collected on d 63 and d 77. In Source 1, YCW C exhibited greater ADG ($P < 0.01$) and G:F ($P = 0.01$) compared with CON. There was an increase in VT in all treatments post-LPS ($P < 0.01$), with YCW C ($39.14 \pm 0.01^\circ\text{C}$) maintaining greater VT post-LPS than CON ($38.89 \pm 0.01^\circ\text{C}$) and YCW A ($38.92 \pm 0.01^\circ\text{C}$; $P < 0.05$). In Source 2, no significant differences in performance were observed. There was an increase in VT in all treatments post-LPS ($P < 0.01$), with YCW C ($38.91 \pm 0.02^\circ\text{C}$) maintaining greater VT post-LPS than CON ($38.83 \pm 0.02^\circ\text{C}$) and YCW A ($38.83 \pm 0.02^\circ\text{C}$; $P < 0.05$). Ambient temperature was extremely high during this study (greater than 45°C at certain times), indicating a period of high

heat stress. Collectively these data suggest that YCW supplementation can affect the physiological response to a mild endotoxin challenge during high heat stress and thereby alter feedlot performance of newly received beef heifers.

Key Words: cattle, immune, yeast

218 A description of dairy heifer raising operations in the United States. J. E. Lombard,* C. A. Koprak, J. M. Rodriguez, B. A. Wagner, and G. W. Hill, *USDA-APHIS-VS-CEAH, National Animal Health Monitoring System, Fort Collins, CO.*

The National Animal Health Monitoring System conducted the first national study of dairy heifer raising operations in 2011. Twenty-one states participated in the study. Operations were identified via multiple methods including previous interaction with state or federal animal health officials, Dairy Calf and Heifer Association membership list, and via word of mouth. Operations had to raise at least 20 dairy heifer calves in 2010 for at least one operation other than their own to be eligible for the study. The response rate was 60% with 228 operations completing the questionnaire. Operations were classified as small (20–99 heifers), medium (100–999 heifers), and large (1000 or more heifers). One objective of this study was to describe management practices on these specialized operations. Approximately 85% of operations sourced dairy heifers directly from other dairy operations and the median number of sources was 2. One third of operations (34.2%) reported obtaining primarily preweaned heifers while almost 2-thirds obtained primarily weaned heifers (60.1%) and 5.7% obtained primarily pregnant heifers. The majority of heifers left the heifer-raising operation as pregnant heifers (78.5%) while 21.5% left the operation as weaned heifers. The majority of operations raising preweaned heifers fed only medicated milk replacer (59.2%) while 32.1% fed only milk. Almost 80% of operations housing preweaned heifers reported cleaning and disinfecting or rinsing feeding equipment with water between every feeding. For operations housing weaned and pregnant heifers, more than 70% fed ionophores in the feed. A higher percentage of larger operations used consultants to the operation such as veterinarians, nutritionists, university/extension personnel and state or federal animal health officials. More than twice as many large and medium operations as small operations reported keeping written or computerized records of dairy heifer growth and/or health information (86.6, 73.1 and 32.1% respectively). Heifer raising operation practices are important in understanding the overall impact of this segment of the dairy industry.

Key Words: heifer-raising, milk replacer, record-keeping

219 Biosecurity practices on dairy heifer raising operations in the United States. J. E. Lombard,* C. A. Koprak, J. M. Rodriguez, B. A. Wagner, and G. W. Hill, *USDA-APHIS-VS-CEAH, National Animal Health Monitoring System, Fort Collins, CO.*

The National Animal Health Monitoring System conducted the first national study of dairy heifer raising operations in 2011. Twenty-one states participated in the study. Operations were identified via multiple methods including previous interaction with state or federal animal health officials, Dairy Calf and Heifer Association membership list, and via word of mouth. Operations had to raise at least 20 dairy heifer calves in 2010 for at least one operation other than their own to be eligible for the study. The response rate was 60% with 228 operations completing the questionnaire. Operations were classified as small (20–99 heifers), medium (100–999 heifers), and large (1000 or more heifers). One objective of this study was to describe biosecurity practices with

special emphasis on the potential transmission of *Mycobacterium bovis* (bovine TB) on these operations. More than 75% of operations obtained dairy heifers from more than one source. Although dairy operations were the primary source of heifers (84.2% of operations), between 10 and 20% of operations obtained heifers from auction markets/sale barns, other heifer raising operations, or from private sales (cattle dealers). A lower percentage of small operations reported testing for any disease (22.8%) and specifically for TB (16.1%) before or at arrival at the raising operations compared with large operations (68.7 and 42.4%, respectively). Almost 70% of operations allowed heifers contact with cattle from other operations. Almost 30% of operations housed dairy-beef or beef cattle in addition to dairy heifers during 2010. No Small operations pasteurized milk fed to heifers, however the primary source of milk was from a single operation. Large operations primarily fed pooled milk from multiple sources but the majority fed pasteurized milk thus reducing the risk associated with feeding pooled milk. Almost 20% of operations reported not vaccinating for any disease in 2010. Heifer raising operations are a potential source for disease transmission due to the commingling of cattle from multiple sources, including beef cattle and the feeding of pooled milk.

Key Words: heifer-raising, biosecurity

220 Pre- and postpartum immunomodulatory effects of a dietary supplement on the immune system of dairy heifers. V. J. Eubanks*¹, D. J. Hurley¹, L. O. Ely¹, F. M. Kautz¹, S. C. Nickerson¹, N. E. Forsberg², Y. Q. Wang², K. P. Zanzalari³, and J. D. Chapman³, ¹University of Georgia, Athens, ²OmniGen Research LLC, Corvallis, OR, ³Prince Agri Products Inc., Quincy, IL.

The purpose of this study was to evaluate the effect of a dietary supplement (OmniGen-AF) on amplifying heifers' immune response to *Staphylococcus aureus* vaccination. Treated heifers (n = 40) receiving the supplement and unsupplemented controls (n = 43) in 8 age groups were monitored during gestation and into early lactation. For the prepartum parameters measured, there were no differences in body weight, hip height, prevalence of IMI, SCC, or differential mammary secretion leukocyte counts between treated and control heifers. Overall prevalence of IMI was 86% of heifers, with *S. aureus* as the most prevalent pathogen (62.1% of heifers, 25.3% of quarters). Front mammary quarters were 4.5 times more likely ($P \leq 0.001$) to be infected with *S. aureus* than rear quarters. Mean SCC of quarters with *S. aureus* IMI was $3,337 \times 10^3/\text{mL}$, while SCC in uninfected quarters averaged $1,846 \times 10^3/\text{mL}$. Regardless of infection status, macrophages predominated in mammary secretions followed by neutrophils and lymphocytes. L-selectin mRNA expression of blood leukocytes from group 1 treated heifers was greater ($P \leq 0.04$) than controls, indicating greater leukocyte activity. Additionally, L-selectin mRNA expression in group 2 treated heifers was greater ($P \leq 0.001$) than controls. Interleukin-8 receptor mRNA expression was generally higher in groups 1 and 2 treated heifers but not significantly different from controls. For the postpartum parameters measured, results showed that treated animals exhibited lower SCC than controls (180 vs. $711 \times 10^3/\text{mL}$) and lower prevalence of mastitis (4% vs. 13%). At 14 d postpartum, treated animals produced a mean of 25.9 kg/d compared with controls producing 21.8 kg/d. Overall, results demonstrated that dietary supplementation with OmniGen-AF improved udder health and milk quality postpartum, resulting in greater milk yield in early lactation.

Key Words: mammary immunity, mastitis, *Staphylococcus aureus*

221 Indoor group housing does not influence performance or measures of innate immune activity of Holstein calves during the neonatal, weaning, and commingling periods. C. J. Cobb,* D. L. Hanson, M. D. Sellers, A. R. Pepper-Yowell, B. S. Obeidat, and M. A. Ballou, *Texas Tech University, Lubbock.*

Objective was to determine if group housing of Holstein calves in indoor pens affects metabolic and innate immunological responses when compared with individually housed calves. Seventy-two calves (2 ± 1 d old) were randomly assigned to 3 treatments: individually housed (G1, $n = 29$), 2 calves/pen (G2, $n = 22$), or 3 calves/pen (G3, $n = 21$). Space allowances per calf were 2.5 m². All calves received an identical high plane of milk replacer nutrition. Weaning was initiated during the 7th week by removing the PM feeding and calves were completely weaned when they consumed 800 g dry matter (DM) calf starter after d 53. At d 91, calves were randomly commingled in groups of 5 calves outdoors. Peripheral blood was collected during the neonatal (3, 10, 21 d), weaning (45, 47, 53 d), and commingling periods (91, 94, 99 d) and was analyzed for neutrophil oxidative burst (OB) capacity when cocultured with an *Escherichia coli*, neutrophil L-selectin expression, whole blood secretion of tumor necrosis factor- α (TNF) when cocultured with lipopolysaccharide. Total DM intake was greater ($P < 0.05$) for G2 and G3 during wk 8 and 9 and also at wk 11 for G3 compared with G1. There were no treatment or treatment x time interactions in average daily gain (ADG; $P = 0.589$). Additionally, there were no treatment or treatment x time effects ($P > 0.185$) on any immunological or biochemical variable throughout the entire study. However, during the neonatal period, there were time effects with an increase ($P < 0.05$) in both TNF and neutrophil L-selectin expression with a concomitant decrease ($P < 0.05$) in OB intensity. During weaning, both neutrophil L-selectin expression and OB intensity increased ($P < 0.05$) on d 47 and returned to baseline or below by d 53 ($P > 0.232$). In contrast, commingling decreased ($P < 0.05$) both neutrophil L-selectin expression and OB intensity on d 94. Although group housing increased post-weaning DM intake, it did not influence ADG or any biochemical or immunological measurement throughout neonatal, weaning, or commingling periods.

Key Words: calf, housing, immune

222 Feed intake, rectal temperature and weight gain in *Bos indicus* crossbred steers challenged with bovine viral diarrhea virus. C. A. Runyan*¹, X. Fang¹, E. Downey¹, T. B. Hairgrove³, J. E. Sawyer², J. C. Bailey¹, J. F. Ridpath⁴, and A. D. Herring¹, ¹Texas A&M University, College Station, ²Texas Agrilife Research, College Station, ³Texas Agrilife Extension, College Station, ⁴USDA-ARS, Ames, IA.

Yearling, Angus-Nelore half-blood steers ($n = 104$) born in the spring of 2010 were evaluated for rectal temperature, feed intake and weight gain following vaccination for Bovine Respiratory Disease (BRD) and intranasal challenge with Bovine Viral Diarrhea Virus (BVDV). Steers were tested to be free of BVD persistent infection and stratified by sire across 3 vaccine treatments: killed vaccine (KV; $n = 34$), modified live vaccine (MLV; $n = 35$), non-vaccinated group (NON; $n = 35$). KV steers were administered vaccine at d -49 and d -25. MLV steers received a single vaccine injection at d -25. At d 0, all steers were challenged intranasally with BVDV Type 1b strain CA0401186a. Animals were monitored daily for clinical symptoms of BRD/BVD; weights and rectal temperatures were collected at d 0, 3, 7, 10, 14, 28, and 42. Daily feed intake (DFI) was collected via a 4-pen Growsafe system. A threshold rectal temperature over 40°C was used to classify animals for temperature status during 14 d post-challenge. Mixed model, repeated measures procedures to analyze DFI included models with fixed effects

of vaccine treatment (VAC), pen, day, sire, rectal temperature status (RTEMP), and 2-factor interactions. ADG was calculated for the 3–14 d periods following challenge with similar fixed effects plus d-0 weight as a covariate. No steers exhibited visual symptoms that would have led to a morbid classification; however, many had RTEMP over 40°C on evaluation days, including d 0 before challenge and on d 28 and 42; as a result RTEMP alone is likely not an ideal indicator of health status in these data. Also pen and several 2-factor interactions involving pen were important ($P < 0.05$) sources of variation. There was an interaction of RTEMP status and d ($P < 0.01$) where in general, steers exhibiting over 40°C during d 3 to 14 had DFI depressed 0.2 to 0.6 kg/d from d 3 to 10 but appeared to compensate after d 14. A pattern existed in DFI where NON steers consistently ranked lower than KV and MLV steers for d 6–11. No differences in ADG were attributed to VAC or RTEMP status.

Key Words: BVD, feed intake, *Bos indicus* crosses

223 Correlations of temperament with titer and hematological responses of crossbred steers challenged with bovine viral diarrhea virus. X. Fang*¹, E. Downey¹, C. A. Runyan¹, J. E. Sawyer⁴, T. B. Hairgrove², J. F. Ridpath³, C. A. Gill¹, W. Mwangi¹, and A. D. Herring¹, ¹Texas A&M University, College Station, ²Texas Agrilife Extension, College Station, ³USDA-ARS, Ames, IA, ⁴Texas Agrilife Research, College Station.

Angus-Nelore F₂ and F₃ yearling steers born in 2009 ($n = 78$) and 2010 ($n = 104$) were administered bovine respiratory disease vaccine treatments of killed (2009 $n = 28$, 2010 $n = 32$), modified live (MLV) (2009 $n = 25$, 2010 $n = 36$) or no (NON) vaccine (2009 $n = 25$, 2010 $n = 36$) and stratified by breed composition and sire across vaccine treatment. Temperament scores of steers were evaluated shortly after weaning (8 mo age) on a 1–9 scale by 4 evaluators. After vaccination (25 to 35 d), steers were challenged intranasally with a Type 1b bovine viral diarrhea virus (BVDV). Serum samples for antibody titer of BVDV (Types 1a, 1b and 2) were collected on vaccination days, BVDV challenge day (d 0), and 14, 28, and 42 d after challenge. Whole-blood samples for hematological counts were collected on d 0, 14, 28, and 42. Pearson correlations of temperament score and titer and hematological measures were evaluated. Mean temperament scores were 4.2 in 2009-born steers and 5.9 in 2010-born steers. Several correlations ($P < 0.05$) between temperament score and the titer of BVDV (type 1a, b and 2), lymphocyte (LYM), neutrophil (NEU) and platelet (PLT) counts were found. On d 0 temperament had correlation from -0.20 to -0.24 with BVDV titers. On d 14, these values were reduced (r of -0.15 to -0.20), and became non-significant at d 28 and 42. LYM, NEU and PLT counts at d 0 were not correlated to temperament. Correlation of temperament and LYM at d 14 was similar to correlation of temperament and BVDV titers at d 14. NEU counts were not related to temperament except at d 28 and 42 (r of -0.19 and -0.20, respectively); PLT counts had similar magnitude of relationship with temperament ($P < 0.05$) for d 14, 28 and 42, but were positive (r of 0.17 to 0.20). When mixed model analyses of titer and hematological measures incorporated the regression on weaning temperament score, it became non-significant as the large individual variability overshadowed the temperament influence. The relationships involving animal temperament and immune response warrant further investigation, particularly in *Bos indicus* crosses.

Key Words: BVDV, temperament, immune response

224 *Cis-9, trans-11 conjugated linoleic acid and NF-κB inhibitor pyrrolidine dithiocarbamate decrease prostaglandin production by bovine endometrial cells treated with lipopolysaccharide.* L. Badinga,* M. S. Gulay, and A. D. Ealy, *University of Florida, Gainesville.*

Uterine bacterial infection or bacterial products suppress pituitary luteinizing hormone (LH) secretion, and are associated with inhibition of folliculogenesis, decreased ovarian steroidogenesis and abnormal luteal phase. To evaluate whether supplemental fatty acids (FA) may attenuate some of the deleterious effects of lipopolysaccharide (LPS) in cattle, we examined the effects of conjugated linoleic acid isomers (100 μM of cis-9, trans-11 and trans-10, cis-12 CLA) on in vitro prostaglandin E2 (PGE2) and F2α (PGF2α) production by bovine endometrial (BEND) cells treated with LPS. The specificity of CLA effects on endometrial PG production was evaluated by using linoleic acid (LA; C18:2) as the control FA. LPS stimulated both PGE2 and PGF2α productions in a dose and time-dependent manner. At 24 h, the concentration of PGE2 in the incubation medium was much higher than that of PGF2α (average ratio of PGE2 / PGF2α = 16.5; $P < 0.01$). The concentration of PGE2 in cell-conditioned media increased ($P < 0.01$) from 2.5 ± 2.0 to 17.4 ± 2.0 ng/mL as the concentration of LPS in the culture medium increased from 0 to 10 μg / mL. Similarly, PGF2α response to LPS increased from 0.2 ± 0.1 to 2.3 ± 0.1 ng / mL as the amount of LPS in the culture medium was raised from 0 to 10 μg / mL. With regard to time effects, the concentration of PGE2 in the culture medium increased ($P < 0.01$) from 0.4 ± 0.2 ng / mL at 3 h to 5.0 ± 0.2 ng / mL at 24 h. Corresponding values for PGF2α were 0.2 ± 0.05 ng / mL at 3 h and 1.0 ± 0.05 ng / mL at 24 h. Addition of FA to the incubation medium decreased ($P < 0.01$) PGE2 response to LPS by 75.6%. The cis-9, trans-11 (c-9, t-11) CLA isomer was more effective (85.1% reduction) than t-10, c-12 CLA (63% reduction) and LA (78% reduction) at decreasing PGE2 concentration. The c-9, t-11 CLA, t-10, c-12 CLA and LA decreased ($P < 0.01$) PGF2α response to LPS by 80%, 40%, and 10%, respectively. Co-incubation with the c-9, t-11 CLA and NF-κB inhibitor pyrrolidine dithiocarbamate decreased PGE2 response to a greater extent than did the CLA or NF-κB inhibitor alone. Results indicate that selective FA and the NF-κB inhibitor are potent inhibitors of LPS effects on endometrial PG secretion. If repeated in vivo, strategic supplementation of CLA may constitute a producer-friendly means of attenuating deleterious effects of the *E. coli* endotoxin in cattle.

Key Words: CLA, prostaglandin, cattle

225 *Peripartum metabolic, immune, and hematological parameters of Jersey cows diagnosed with periparturient diseases.* P. R. B. Silva*^{1,2}, J. G. N. Moraes^{1,2}, L. G. D. Mendonça¹, G. Nakagawa¹, and R. C. Chebel¹, ¹Department of Veterinary Population Medicine, University of Minnesota, St Paul, ²Department of Animal Science, University of Minnesota, St Paul.

Objectives were to evaluate the metabolic, immune, and hematological parameters of Jersey cows diagnosed with postpartum diseases. Blood was sampled weekly from d -21 to 21 (calving = d0) for NEFA concentration (n = 567) and weekly from d -14 to 14 from a subgroup of cows (n = 68) for neutrophil phagocytosis (PHAGO), oxidative burst (OXID), and expression of CD18 and L-selectin, hemogram, and glucose concentration. Cows were examined on d1 for retained fetal membranes (RFM) and on d4, 7, 10, and 14 for metritis (METR) and were observed daily for displacement of abomasum (DA). Data were analyzed by MIXED procedure with disease as the fixed effect (yes vs no) and cow as the random effect. Receiver operator characteristics analyses were used to determine NEFA concentrations that most accurately predicted disease. Interaction of RFM by day and METR by day were ($P < 0.05$) associated with OXID and PHAGO because RFM cows and METR cows had reduced OXID and PHAGO on d0 than normal cows. Interaction of RFM by day tended ($P = 0.08$) to be associated with CD18 expression intensity as RFM cows had higher intensity on d14 than normal cows. Greater percentage of neutrophils from RFM ($P = 0.03$) and METR ($P < 0.01$) cows expressed L-selectin than normal cows. Interaction of RFM by day and METR by day were ($P < 0.04$) associated with leukocyte count because leukocyte count was highest on d0 in normal cows but leukocyte count was highest from d-14 to 0 in RFM and METR cows. Interaction of METR by day tended ($P = 0.08$) to be associated with neutrophil count because only normal cows had increase neutrophil on d0. Interaction of RFM by day was ($P < 0.01$) associated with glucose because on d-7 and 7 RFM cows had greater glucose than normal cows. Interaction METR by day was associated with glucose ($P = 0.02$) and NEFA ($P < 0.01$) concentration because METR cows had greater glucose pre and postpartum and greater NEFA on d -14, 0, and 7 than normal cows. Interaction of DA and day was ($P = 0.03$) associated with NEFA because DA cows had greater NEFA on d -7, 0, 7, and 21 than normal cows. NEFA >0.18 mmol/l on d-7 predicted DA with 66.7% sensitivity and 76.4% specificity and NEFA >0.43 mmol/l on d0 predicted metritis with 46.2% sensitivity and 74.1% specificity. Immune, metabolic, and hematological alterations peripartum were associated with postpartum diseases.

Key Words: prepartum dairy cow, immune parameter, metabolic parameter