Effects of an experimental feed additive (OmniGen-EQ) on immune markers in horses was tested. Eighteen horses were assigned to 2 treatment groups which consisted of a control group and a treated group (9 animals/treatment). The control group consisted of 3 mares and 6 geldings which ranged in age from 2 to 17 years. The treatment group consisted of 3 mares and 6 geldings which ranged in age from 1 to 16 years. Animals on the control diet were allowed free-choice access to hay plus 1.8 kg/head/day of a supplement which contained approximately 18% crude protein, 2% crude fat and 6% crude fiber on an as-fed basis. Animals on the treated group received the same diet except for supplementation with the experimental product such that each horse received an intake of 108 g per day. Animals were individually fed supplement and maintained on treatment for 28 d. Blood samples were taken on d 0, 14 and 28 and neutrophils were isolated using Percoll gradient centrifugation. Ability of freshly isolated neutrophils to kill (phagocytose) an equine pathogen (Streptococcus equi) was assessed on d 28 using a pathogen killing assay. Killing assays were performed at ratios of 1 neutrophil:30 S. equi (1:30) and 1:60. Neutrophil RNA was isolated using Trizol and concentrations of L-selectin, interleukin-8 receptor (IL-8R) and RPL-19 mRNAs were assessed using quantitative (SYBR-green) reverse transcriptase PCR. RPL-19 mRNA was used as the background gene. Data were analyzed by ANOVA with effects consisting of Treatment, Day and Error. One horse on the control treatment died on d 25 due to colic. The additive improved neutrophil killing efficiency (P < 0.05) by 16 and 22% at dilutions of 1:30 and 1:60, respectively. Feeding OmniGen-EQ had no effect on neutrophil L-selectin and IL-8R mRNAs on d 14; however, concentrations of both mRNA species were increased several-fold (P < 0.05) after 28 d of feeding. These data demonstrate that feeding the experimental additive to horses improves markers of innate immune function.

Key Words: immunity, horse, neutrophil

Effects of OmniGen-AF on development of humoral immune responses in beef cattle and in rats following a vaccination program. S. B. Puntenney*, Y. Wang, A. Rowson, and N. E. Forsberg, OmniGen Research LLC, Corvallis, OR.

Two experiments were completed in which effects of OmniGen-AF on development of titer were examined. In the first study, male rats (8/trt) were assigned to a control diet (Teklad 8604) or to a diet containing OmniGen-AF (0.5% w/w) for 54 d after which all animals were given the control diet through d 87. Animals were vaccinated twice with an E. coli vaccine on d 10 and 24 of the study and blood was sampled from rats on d 0, 24, 37, 54, 73 and 87. E. coli titer within the IgG1 fraction was determined by ELISA. In the second study, Angus calves (ca. 250 kg) were assigned to one of 2 treatments (20 animals/trt): a control ration and to the same ration but supplemented with OmniGen-AF (56 g/hd/d) beginning at d 0. Animals were maintained on rations for 60 d and vaccinated with the Novavirs Virashield vaccine on d 14 and again 1 mo later. A subset of animals (10/trt) was also vaccinated with the Epitopix SRP (Salmonella) vaccine following initial feeding with OmniGen-AF. Serum neutralization assays against the BVDV-1, BVDV-2 and IBR were completed by the Oregon State University College of Veterinary Medicine Diagnostic Laboratory. Titer directed against the SRP vaccine was assessed by Epitopix. IgG1 E. coli titer in rats was significantly (P < 0.05) elevated on d 24, 37 and 54 of the study. No differences between treatments (P > 0.05) were noted following withdrawal of the additive on d 54 of the study. OmniGen-AF increased development of BVDV-1 and Salmonella titer by almost 2-fold; however, these effects were not significant (P = 0.112 and 0.118, resp). BVDV-2 titer was not detectable in either treatment group. OmniGen-AF increased IBR titer significantly (P < 0.05). In previous studies, we reported that OmniGen-AF increased development of E. coli titer in calves vaccinated with the Pfizer JS E. coli vaccine. These studies extend those observations and indicate that pre-feeding OmniGen-AF may increase humoral immune responses to vaccines. Further work is needed to determine conditions under which one might reliably derive benefit to humoral immunity.

Key Words: immunity, OmniGen-AF, vaccination

Effect of colostrum supplementation on health and performance of pre-weaned and post-weaned dairy calves. B. Ozer*, M. Chahine1, C. M. Matuk1, M. E. de Haro Martí2, and M. Nelson1, 1University of Idaho, Twin Falls, 2University of Idaho, Gooding.

836 Effects of an experimental feed additive on neutrophil-mediated killing of Streptococcus equi and on markers of innate immune function in horses. A. Rowson*, D. Sherwood2, Y. Wang1, S. Puntenney1, and N. E. Forsberg1, 1OmniGen Research LLC, Corvallis, OR, 2Oregon State University, Corvallis.

837 Effects of OmniGen-AF on development of humoral immune responses in beef cattle and in rats following a vaccination program. S. B. Puntenney*, Y. Wang, A. Rowson, and N. E. Forsberg, OmniGen Research LLC, Corvallis, OR.
841 Characterization of immune and metabolic responses in the blood of dry cows induced with sub-acute ruminal acidosis (SARA). A. D. Kroeker*1, S. Li1, S. Shekhar1, A. Ceballos2, E. Khafipour1, D. O. Krause1, J. C. Plaizier1, and J. C. Rodriguez-Lecompte1, 1University of Manitoba, Winnipeg, Manitoba, Canada, 2Cornell University, Geneseo, NY.

Subacute ruminal acidosis (SARA) increases lipopolysaccharide endotoxin (LPS) in the rumen, due to lysis of gram-negative bacteria. This LPS can translocate into the blood during SARA, which causes inflammation. The objective of this study was to determine the systemic immune and metabolic responses in the blood of cows with 2 forms of SARA. Six dry, non-pregnant, dairy cows were used in a Latin Square with 3 periods of 4 wk. During wk 1–3 of all periods cows received the control diet containing 70% forage and 30% mixed concentrates (DM basis). During wk 4, cows either received the control diet (T1 control diet), treatment 2 (T2, alfalfa pellet-induced SARA (API_SARA), 45% mixed concentrate, 32% alfalfa pellets, and 23% other forages), or treatment 3 (T3) (GPI_SARA, 38% wheat-barley pellets, 32% other mixed concentrate, and 30% forages). Blood cell, serum chemistry, acute-phase proteins (fibrinogen, serum amyloid A (SAA), haptoglobin (Hp), and LPS binding protein (LBP), and peripheral blood leukocyte cell surface marker (CD14) parameters were evaluated. The durations of the rumen pH below 5.6 were 56.4, 225.2 and 298.7 min/d for control, API_SARA, and GPI_SARA, respectively. This shows that both forms of SARA resulted in similar depressions of rumen pH, and that SARA was induced. Treatments did not affect leukocyte and differential count, red blood cells, hemoglobin, mean corpuscular volume (PCV), mean corpuscular hemoglobin, mean corpuscular hemoglobin concentration, and clinical chemistry parameters. However, PCV decreased in T2 and T3 cows. Also, urea was lower in T2 cows 9 d after the beginning of treatment. There were increases in SAA and LBP in T3. There were no changes in the total protein to fibrinogen ratio, suggesting no inflammatory activity; however, the albumin to globulin ratio increased in T3 cows during the second period of the study. No differences were found the proportion of peripheral blood neutrophils and monocytes expressing CD14. In conclusion, our results suggest that immunological and metabolic parameters were not affected by SARA

Key Words: SARA, LPS, CD14

840 Evaluation of immunological status of newborn dairy calves when respective dams were fed a stepwise moderate energy diet or a controlled energy diet during the dry period. J. S. Osorio*1, P. Ji1, G. Invernizzi1,2, J. K. Drackley3, and J. J. Loor1, 1University of Illinois, Urbana, 2University of Milan, Milan, Italy.

Decreases in dry matter intake and increases in concentrations of non-esterified fatty acids and cortisol during the periparturient period have been associated with an impaired immunological status in dairy cows. Controlling energy intake during the dry period has been proposed to diminish these conditions during early lactation. The extent of these effects on the immunological status of newborn calves is unknown. Holstein cows (n = 12) were randomly assigned to a stepwise moderate energy (ME) diet (1.49 Mcal/kg) or a controlled energy (CE) diet (1.30 Mcal/kg) during the close-up period (−21 to 0 d relative to calving). All cows were fed CE during the far-off period (−50 to −21 d relative to calving). At birth, calves were separated from dams and during the first 24 h received at least 3.8 L of dam’s colostrum with minimum 60 g/dL of solids density. Blood samples were taken at birth (Pre-colostral) and 24 h received at least 3.8 L of dam’s colostrum with minimum 60 mg/L of solids density. Blood samples were collected at 24 ± 3 h of age and tested for total serum protein (TSP). Pre-weaned period rectal body temperature was measured every other day. Health evaluations were conducted daily by study personnel until calves were 3 mo of age. Pre-weaned fecal (FC), dehydration (DH) and respiratory (RS) scores were recorded. TSP concentrations were significantly greater (P < 0.01) in calves fed MC (TSP = 6.17 ± 0.09 g/dL) compared with calves fed MCS (TSP = 5.84 ± 0.09 g/dL). Rectal body temperature did not differ between MC and MCS and averaged 39.0°C ± 0.03. No differences were detected in pneumonia, diarrhea, or mycoplasma incidence which averaged 61.7%, 10.5%, and 38.3% respectively. MCS calves had a greater (P < 0.006) incidence of abnormal RS score (58.5%) compared with MC (27.3%). FC and DH scores did not differ between treatments and averaged 27.6% and 12.7% respectively. Thus in this study, adding a supplement to maternal colostrum did not achieve any positive effect on performance and health parameters of dairy calves.

Key Words: colostrum, colostrum supplement, total serum protein