

T95 Anti-rbosCD14 monoclonal antibodies (mAb) inhibits in vitro production of tumor necrosis factor- α (TNF- α) by bovine monocytes following stimulation with LPS. E. J. Sohn^{*1}, M. J. Paape², R. R. Peters¹, and D. D. Bannerman², ¹Department of Animal and Avian Sciences, University of Maryland, College Park, ²Bovine Functional Genomic Laboratory, USDA-ARS, Beltsville, MD.

Endotoxin (lipopolysaccharide, LPS) from Gram-negative bacteria activates host innate immune responses that promote bacterial clearance. Paradoxically, such a response also contributes to septic shock, a clinical problem occurring with high frequency during Gram-negative septicemia. CD14 is a glycoprotein which binds LPS and initiates cell activation. The production of TNF- α by monocytes stimulated with LPS is mediated, in part, by the interaction of LPS with CD14 on mono-

cytes. The objective of the present study was to investigate whether anti-rbosCD14 mAb could block the production of TNF- α by bovine monocytes stimulated with LPS. The concentration of LPS used ranged from 1 to 100 ng/ml. The inhibition of anti-rbosCD14 mAb on the LPS induced production of TNF- α by adherent monocytes during a 24 h of incubation was dose dependent. The greatest inhibition (61%) was achieved when 100 ng/ml of LPS was used to stimulate the monocytes. With 1 and 10 ng of LPS/ml, inhibition averaged 37% and 54%, respectively. The inhibition of TNF- α secretion by anti-rbosCD14 mAbs can be explained by the binding of mAb to membrane bound CD14 on the monocytes, thus blocking interaction of LPS with mCD14. The anti-rbosCD14 mAb has the potential for neutralization of TNF- α during acute coliform mastitis.

Key Words: Endotoxin, CD14, TNF- α

Companion Animals

T96 Serum and urine indice comparisons between llamas and alpacas fed three forages. M. Sharp^{*}, C. Horey, T. F. Robinson, and B. L. Roeder, Brigham Young University, Provo, UT.

The objective of this experiment was to determine species differences for serum and urine indices between llamas and alpacas fed three forages of differing quality. Four llamas (115 kg BW; 3yrs old) and four alpacas (58 kg BW; 3 yrs old) were housed in metabolic crates, given ad libitum water and grass hay initially. Three forage treatments of alfalfa (AH), barley (BH) and grass (GH) were fed in random order to each animal. Treatment periods were for 14 d; d1 to d12 for forage adjustment and d13 to d14 for collection. Animals were fitted with a urine collection harness and a jugular venous catheter. Forages were fed ad libitum and feed intake determined. Blood and urine were collected at 4-hr intervals on d13 and 14. Serum and urine aliquots were analyzed for electrolytes (Na, Cl, K, Ca and P), urea N, creatinine. Feed intake differed between species and forage ($P < .05$), alfalfa the highest and llamas consuming more than alpacas. Serum electrolytes, osm and creatinine were not different. Glucose levels were higher ($P < .01$) for llamas than alpacas, 7.7 to 7.2 mmol/L. Total serum protein was higher for llamas than alpacas ($P < .05$; 6.6 to 5.8 g/dL), while PUN was affected ($P < .01$) by forage: 7.8, 4.7 and 3.9 for AH, BH and GH. Urine results are expressed on a metabolic weight basis ($\text{kg}^{-.75}$). AH urine excretion was highest ($P < .005$) at 70.9, and 42.2 and 32.8 ml/d/mwt for BH and GH. Urine electrolyte excretion differed for diet ($P < .05$; Na: 3.0, 3.6, 1.6 mmol/d/ $\text{kg}^{-.75}$; Cl: 27.2, 22.1, 18.9 mmol/d/ $\text{kg}^{-.75}$; K: 11.4, 5.9, 6.1 mmol/d/ $\text{kg}^{-.75}$ for AH, BH and GH). PUN excretion differed for species, forage and the interaction ($P < .03$), 281, 126 and 87 mmol/d/ $\text{kg}^{-.75}$ for AH, BH and GH and 189 vs.140 mmol/d/ $\text{kg}^{-.75}$ for llamas and alpacas. Creatinine excretion was not different. It has been hypothesized that llamas and alpacas are similar in physiology and respond to diets in a similar fashion. These data demonstrate that the two species responded similarly to the three forages, with the exception of serum glucose and total protein and urine urea N. Diet did affect urine indices.

Key Words: Alpaca, Llama, Forages

T97 Affect of water deprivation on plasma and urine analytes of alpacas. A. Peterson^{*}, J. A. Anderson, T. F. Robinson, and B. L. Roeder, Brigham Young University, Provo, UT.

Four male alpaca (62 kg BW, 3 yrs old) were housed in metabolism crates and given ad libitum water and grass hay. The alpacas were fitted with a urine collection harness and a jugular catheter. Urine and plasma were collected at 4-hr intervals during the 14 d baseline, 120-hr water dehydration (Dh) and 160-hr rehydration (Rh) periods. Plasma and urine were analyzed for electrolytes (Na, Cl, K and Ca), total protein, urea N and creatinine. Data are presented as a mean of the baseline samples at the 4-hr interval times, while Dh and Rh data were analyzed as repeated measures using SAS Proc Mixed. Water intake was 24.4 ml/d/ $\text{kg}^{-.75}$ while urine output was 7.1 ml/d/ $\text{kg}^{-.75}$. Pack cell volume increased ($P < .001$) during Dh from 24 to 32%, returning to 23% for Rh. Plasma osm increased ($P < .001$) from 312 to 356 mmol/kg with the Dh/Rh, while COP increased ($P < .001$) from 21 to 24 mmHg. Plasma electrolytes increased ($P < .001$). Na and Cl increased from 149 and 121 mmol/L to 161 and 133 mmol/L, respectively. K increased from

4.9 to 5.4 mmol/L ($P < .001$). Glucose increased ($P < .001$) from 7.1 to 8.4 mmol/L, with PUN increasing from 2.7 to 8.6 mmol/L ($P < .001$). Creatinine was not affected and TPP increased ($P < .001$) from 5.6 to 6.1 g/dL. Urine osm increased from 1100 to 1800 mmol/kg ($P < .001$). Urine electrolyte excretion was affected by Dh. Na increased from 0.30 to 1.30 mmol/d/ $\text{kg}^{-.75}$. Cl was unchanged during Dh and increased from 1.5 (baseline and Dh) to 3.0 mmol/d/ $\text{kg}^{-.75}$ during the Rh period. K decreased from 1.1 to 0.13 mmol/d/ $\text{kg}^{-.75}$ during the Dh period. PUN excretion increased from 5.7 to 12.5 mmol/d/ $\text{kg}^{-.75}$, and creatinine increased from 1.1 to 8.0 mg/d/ $\text{kg}^{-.75}$ ($P < .001$). Alpacas respond similarly to Dh/Rh as do llamas, with the exception being increased urine urea N excretion. This implies that alpacas do not recycle urea N to Cl during Dh. Glucose may have been elevated from endogenous glucocorticoid release during Dh and during Rh rebounded due to realimentation. Rh elicited a diuresis affect with increased Na and very large Cl excretion.

Key Words: Alpaca, Dehydration, Analytes

T98 Affect of water deprivation on plasma and urine analytes of llamas. J. A. Anderson^{*}, A. Petersen, T. F. Robinson, and B. L. Roeder, Brigham Young University, Provo, UT.

Four male llama (123 kg BW, 3 yrs old) were housed in metabolism crates and given ad libitum water and grass hay. The llamas were fitted with a urine collection harness and a jugular catheter. Urine and plasma were collected at 4-hr intervals during the 14 d baseline, 120-hr water dehydration (Dh) and 160-hr rehydration (Rh) periods. Plasma and urine were analyzed for electrolytes (Na, Cl, K and Ca), total protein, urea N and creatinine. Data are presented as a mean of the baseline samples, while the Dh and Rh data were analyzed as repeated measures using SAS Proc Mixed. Water intake was 17.8 ml/d/ $\text{kg}^{-.75}$ while urine output was 3.7 ml/d/ $\text{kg}^{-.75}$. Pack cell volume increased ($P < .001$) during the Dh period from 24 to 28%, returning to 23% for Rh. Plasma osm increased ($P < .001$) from 315 to 354 mmol/kg with the Dh/Rh, while COP increased ($P < .001$) from 22 to 24 mmHg. Plasma electrolytes increased ($P < .001$) with the exception of K. Na and Cl increased from 151 and 125 mmol/L to 166 and 133 mmol/L, respectively. Glucose increased ($P < .001$) from 6.6 to 7.7 mmol/L, with PUN increasing from 4.3 to 7.8 mmol/L ($P < .001$). Creatinine was not affected. Urine osm increased from 2500 to 3000 mmol/kg ($P < .001$). Urine electrolyte excretion was affected by Dh. Na increased from 0.11 to 1.40 mmol/d/ $\text{kg}^{-.75}$. Cl was unchanged during Dh and increased from 2.5 (baseline and Dh) to 6.0 mmol/d/ $\text{kg}^{-.75}$ during Rh. K decreased from 1.1 to 0.4 mmol/d/ $\text{kg}^{-.75}$ during Dh. PUN excretion was not affected by Dh, while creatinine increased from 0.6 to 9.4 mg/d/ $\text{kg}^{-.75}$ ($P < .001$). These data indicate that llamas respond to Dh/Rh with similar increases followed by decreases in PCV, PUN, plasma Na, urine Osm, and urine electrolytes. Exceptions were plasma K and creatinine which did not change. Glucose may have been elevated from endogenous glucocorticoid release during Dh and during Rh rebounded due to realimentation. Rh elicited a diuresis affect with increased Na and very large Cl excretion. Unlike other species during Dh, llamas recycle large quantities of urea N to Cl, avoiding pre-renal azotemia.

Key Words: Llama, Dehydration, Analytes