

Animal Health: General

TH5 Hard water preservative effect of Birjand Quanats to reduce lead acetate toxicity on *Capoeta fusca*. A. Omid^{*} and H. Farhangfar, *Birjand University, Birjand, Iran.*

This study was conducted in order to determine the acute toxicity of lead acetate on *Capoeta fusca*. For this purpose 580 fishes with mean length of $12/28 \pm 0/14$ and mean weight of $16/64 \pm 0/52$ were divided into 15 control and treatment groups of fishes. The fishes kept in 20 L aquariums and the procedure designed in static condition according to Organization Economic Cooperation and Development (OECD) method. Mortality rate was recorded in 96 h and lead acetate LC50 was calculated by standard statistical method. LC50 of 10/992, 10/594, 9/338 and 7/575 ppm were determined at 24, 48, 72 and 96 hours post exposing respectively. Also minimum and maximum lethal concentrations of lead were determined as 4 and 12/5 ppm and MAC was 0/7575. Lead acetate in soft water (Hardness 10 mg/L) was highly toxic for fish but in hard water (Hardness: 310 mg/L) had a little toxicity. High trend of lead for interaction with minerals such as calcium and carbonates is the major reason of this phenomenon. Lead toxicity is decreased with increase of water hardness and this is the cause of fish tolerance against some heavy metals pollution in natural environment.

Key Words: *Capoeta fusca*, Water Hardness, Lead Acetate

TH6 Less common complication of traumatic reticulitis in cattle: Abscess on left thoracic wall. A. Omid^{*}, *Birjand University, Birjand, Iran.*

Little accurate information is available on the prevalence or incidence of thoracic abscess as a complication of traumatic reticulitis. During two years among 75 cases confirmed suffering from traumatic reticulitis five cows with thoracic abscesses were examined clinically, radiography and ultrasonographically. There was a wide range of clinical signs include anorexia, abdominal pain, recurrent tympany and/or weight loss. All of the cases had a big abscess in back portion of left humerus on thoracic wall. In every case, the diagnosis was confirmed by centesis and aspiration of the abscess. In all cows, radiographic findings revealed a metal foreign body in the reticulum penetrating it. Ultrasonography revealed a large reticular abscess with a well developed capsule appeared as echogenic deposits that sometimes accompanied by hypoechogenic fluid. Abscesses had an echogenic capsule with a hypoechogenic center. The abscess was elongated toward left thoracic wall and appeared in posterior portion of left humerus. In one case, the tip of wire was detected on abscess surface but in others the skin was intact. The abscess was incised and drained from body surface and reticulum during a rumenotomy. All the cows after abscess drainage and treatment with antibiotics recovered their health. Clinical findings, laboratory testing, ultrasonography and radiography when combined each other, could have a large practical application in diagnosis and treatment of traumatic reticulitis complications. Foreign bodies should be considered in the differential diagnosis of localised swelling on thoracic wall. Ultrasound was a useful diagnostic tool, to help retrieve a fluid sample for culture and sensitivity, monitor the progression of the lesion and to guide surgical debridement

Key Words: Traumatic Reticulitis, Abscess, Cow

TH7 Comparison of attachment to feed ingredients of whole *E. coli* K88 cells and purified F4/K88 fimbriae. P. M. Becker¹, S. Galetti², J. Van der Meulen¹, A. Bannink^{*1}, and H. C. A. Widjaja¹, ¹*Wageningen University Research Centre, Lelystad, The Netherlands,* ²*University of Milan, Milan, Italy.*

F4(K88) fimbriae-producing ETEC are an important cause of diarrhea in young pigs. Alternative adhesion matrices that interfere with the attachment of *E. coli* K88 to pig intestinal receptors are promising antidotes. In this study, live *E. coli* K88 cells (O149 F4(K88)ac, K91, LT, STb) were compared with purified F4(K88ac) fimbriae in terms of their binding capacity for feed-related plant materials. For determination of whole cell attachment, microtitration plates were coated with suspensions of powdered plant materials in PBS buffer, employing BSA as blocking reagent and reference. *E. coli* K88 cells were allowed to adhere to the coating at RT for 30 min. Then, the wells were washed to remove non-adherent bacteria. After addition of Minca-IsoVitaleX medium, plates were incubated in the reading chamber of a photometer at 37°C. The OD was automatically read at 650 nm in 15 min intervals. The test principle was based on an inverse relationship between adhering cell numbers and detection times of growth. For determination of F4 fimbrial binding, microtitration plates were coated with 0.1 µg fimbriae/well. Suspensions of powdered plant materials were pipetted into the wells and plant materials were allowed to bind to F4 fimbriae during incubation at room temperature for 1 h. Then, the plates were washed to remove non-binding material. F4-fimbriae that were not masked by bound plant material were quantified by means of HRP-conjugated Mab AC5 antibodies. For three plant materials, namely tempeh (fermented soybeans), pumpkin fruit, and tomato fruit, the high binding affinity of whole *E. coli* K88 cells was supported by the results obtained with purified F4 fimbriae. In other cases, such as for a yeast cell-wall preparation, sunflower meal, and sesame seed meal, additional factors to F4 on the cell surface of *E. coli* K88 might have contributed to the binding of intact cells.

Key Words: Anti-Adhesion, *E. coli* K88, Plant Materials

TH8 Effects of spray-dried porcine plasma on nasal associated lymphoid tissue in a lung inflammation model in mice. A. Pérez-Bosque^{1,2}, M. Maijó¹, L. Miró¹, J. Polo², L. Russell³, J. Campbell³, E. Weaver³, J. Crenshaw³, and M. Moretó^{*1}, ¹*Universitat de Barcelona, Barcelona, Spain,* ²*APC Europe, Granollers, Barcelona, Spain,* ³*APC Inc., Ankeny, IA.*

Spray-dried porcine plasma (SDPP) is a complex mixture of proteins and other biologically important compounds that is used as a dietary supplement for farm animals. Dietary supplementation with animal plasma can ameliorate the inflammatory response in an experimental model of intestinal inflammation induced by *S. aureus* enterotoxin B. Since the common mucosal immune system connects the inductive sites (Peyer's patches and Nasal Associated Lymphoid Tissue; NALT) with the effector sites (lamina propria of the intestinal and respiratory tracts) we have now studied the effect of dietary plasma proteins on pulmonary inflammation. C57BL/6 Hsd mice were fed diets supplemented with 8% SDPP (SDPP group), 1.5% IgC (porcine immunoglobulin concentrate; IgC group) or milk proteins (Control group) from day 19 (weaning) until day 33. On day 32, mice were given an intranasal dose of 500 µg LPS/kg

b.w. (groups LPS, LPS-SDPP and LPS-IgC), or PBS (groups Control, SDPP and IgC), and killed 24h later. The percentages of subpopulations of lymphocytes and polymorphonuclear cells (PMN) in bronchoalveolar lavage fluid (BALF) and in lung tissue were measured. In BALF, LPS administration increased 27-fold the number of leucocytes. LPS also modified the profile of the cells in BALF (In Control group, 3% were lymphocytes and 97% PMN; in LPS group they were 40% and 60%, respectively; $P < 0.001$). Diets supplemented with either SDPP or IgC did not modify the LPS response, but SDPP reduced the LPS-induced activation of monocytes ($P < 0.05$). In lung tissue, LPS increased the percentage of neutrophils and monocytes, resulting in a 50% increase in infiltrated granulocytes ($P < 0.05$). The supplemented diets did not modify the LPS effects. However, both SDPP and IgC diets reduced the percentage of resident neutrophils and monocytes ($P < 0.05$) as well as the degree of activation of lung neutrophils ($P < 0.05$). These results indicate that plasma protein supplementation reduces innate immune cells from NALT without affecting the pulmonary immune response to LPS, although the degree of activation of infiltrated monocytes may be reduced by SDPP.

Key Words: Acute Lung Inflammation, Plasma Protein Supplements

TH9 Endophyte infected fescue seed causes vasoconstriction in horses as measured by Doppler ultrasonography. E. S. Moore*, A. G. Parks, L. M. Lawrence, and K. J. McDowell, *University of Kentucky, Lexington.*

Pregnant mares grazing endophyte infected (E+) tall fescue frequently incur problems in late pregnancy such as extended gestation, thickened placenta, dystocia,agalactia, and potentially death of the foal and/or mare. This experiment was designed to test the hypothesis that consumption of E+ tall fescue seed by horses causes vasoconstriction that can be measured by Doppler and real-time ultrasonography. Eleven horses were randomly assigned to receive either E+ whole fescue seed (E+W; n=3), E+ ground fescue seed (E+G, n=4), or E- ground fescue seed (E-G; n=4). The experiment was divided into two periods (P). P1 was an adjustment period during which a sweet feed ration and alfalfa cubes were fed, and varied from 7-14 days as horses established a consistent feed intake. P2 was a 15-day treatment period during which fescue seed was mixed into the feed rations. Seed was mixed with the daily grain ration in twice/day feedings, in increasing amounts such that each day horses received seed at 0.16% body weight (BW) on days 4-9 (averaging 327 ppb ergovaline and 227 ppb ergovalinine) and 0.22% BW on days 10-15 (averaging 416 ppb ergovaline and 288 ppb ergovalinine). The medial palmar artery of the left foreleg of each horse was scanned using real-time B-mode, color Doppler and Doppler spectral traces on 3 or 4 days during P1, and on 4 days during P2 (days 3, 8, 10 and 15 relative to seed being offered). Five replicate scans were taken on each horse on each day and 14 measurements were taken during each scan. The sonograms were performed by the same 2 people throughout and sonographers were blinded to treatment. When P2 was compared to P1, animals fed E+G fescue seed had reduced ($p < 0.05$) cross sectional vessel diameter (long axis, short axis and mean diameter), circumference and area, whether examined within individual animals or across animals by treatment group. Consumption of E+G fescue seed caused vasoconstriction which could be measured by Doppler ultrasonography.

Key Words: Horse, Fescue, Doppler Ultrasonography

TH10 Survey of *Clostridium perfringens* Type A prevalence and genotypes in calves and *in vitro* development of Omni-Bos CB™, a calf specific, *Bacillus*-based direct fed microbial. C. Wehnes*, V. Patskevich, K. Mertz, and T. G. Rehberger, *Agtech Products, Inc., Waukesha, WI.*

Clostridium perfringens Type A has been associated with diarrhea (scours) in calves; however, there is a lack of data characterizing *C. perfringens* genotypes in calves. Therapies and prophylaxes are available for *C. perfringens* A; however, these products typically were either not designed specifically for reducing *C. perfringens* or were designed against only a few toxinotypes of *C. perfringens*. Therefore, a survey of *C. perfringens* in calves was performed with the objectives of assessing *C. perfringens* prevalence and genotypes. Genotyping results were utilized to develop a *Bacillus*-based direct fed microbial (DFM) which inhibited a broad range of *C. perfringens* genotypes. From March 2005 to January 2006, 705 fecal swabs and 108 gastrointestinal tract samples were collected from scouring calves in California, Iowa, Ohio, Pennsylvania, Washington, and Wisconsin. Randomly Amplified Polymorphic DNA Polymerase Chain Reaction and BioNumerics software (Applied Maths Inc. Austin, TX) were utilized to create genetic fingerprints and to assess *C. perfringens* genotypic diversity respectively. *C. perfringens* were detected in 239 of 813 samples (29%) and 917 *C. perfringens* colonies were isolated. All isolates were *C. perfringens* A. The results of the *C. perfringens* genotypic survey indicate that there were 149 genotypes at 75% similarity using the Dice similarity coefficient with the unweighted pair group method using arithmetic averages. Representatives of all 149 genotypes were utilized in an inhibition assay to determine percent inhibition of *C. perfringens* by the filtrates of six *Bacillus* strains. A multistrain product (Omni-Bos CB™) was formulated using three *Bacillus* strains. BS1 inhibited 88%, BS3 inhibited 85%, and BS8 inhibited 82% of the *C. perfringens*; together these strains inhibited 89%. Future research should focus on testing the effects of this novel DFM *in vivo* as well as comparing inhibition of *C. perfringens* by the therapies and prophylaxes available for use in calves with this DFM.

Key Words: Probiotic, RAPD PCR, Microbiota

TH11 The effects of feeding tall fescue seed on daily feed intakes of horses. A. G. Parks* and L. M. Lawrence, *University of Kentucky, Lexington.*

Twelve horses (3 mature geldings, 6 mature, non-pregnant mares, and 3 two-year-old fillies) were studied in a randomized complete block design. Each horse's daily feed intake was monitored through an adaptation period and a 14-d treatment period. Horses were maintained throughout the adaptation and treatment periods on a diet of alfalfa cubes (fed ad libitum) and sweet feed (0.4% BW daily, as fed). During the adaptation period, horses were offered increasing amounts of alfalfa cubes daily until the amount of cubes offered exceeded the amount of cubes consumed. The length of the adaptation period varied (7-14 d) depending on the length of time required to establish a consistent cube intake for all horses in the group. After the adaptation period, horses were randomly assigned to one of three treatments: endophyte-free ground tall fescue (TF) seed (E-G), endophyte-infected ground TF seed (E+G), or endophyte-infected whole TF seed (E+W). Seed was topdressed on the sweet feed in increasing amounts during d 0-4. Horses were then offered seed at 0.16% body weight on d 4-9 and at 0.22% BW on d 10-14. For d 4-9, E+ diets averaged 327 ppb ergovaline and 227 ppb ergovalinine. Ergovaline and ergovalinine concentrations in the E+ diets on d 10-14

averaged 416 ppb and 288 ppb, respectively. Two horses in the E+G group refused portions of the sweet feed and seed mixture on several days, suggesting a palatability issue with this treatment. However, inclusion of E- or E+ seed in the diet did not affect mean daily alfalfa cube intakes for the final three days of the study compared to the final three days of the adaptation period for E-G horses (10.3 ± 1.1 kg vs. 10.8 ± 0.8 kg, $P = 0.371$), E+W horses (10.9 ± 0.4 kg vs. 11.0 ± 0.2 kg, $P = 0.681$), or E+G horses (10.3 ± 0.6 kg vs. 10.2 ± 0.5 kg, $P = 0.882$). While tall fescue seed consumption did not appear to affect daily feed intake, all observations were made in the fall when environmental temperatures were mild. Further studies should be conducted in hot weather.

Key Words: Fescue Toxicosis, Horses, Intake

TH12 Hemodynamics in the caudal artery of beef heifers fed different ergot alkaloid concentrations. G. E. Aiken^{*1}, J. R. Strickland¹, M. L. Looper², and F. N. Schrick³, ¹USDA-ARS-Forage-Animal Production Research Unit, Lexington, KY, ²USDA-ARS-Dale Bumpers Small Farms Research Center, Booneville, AR, ³University of Tennessee, Knoxville.

Doppler ultrasonography was used to compare hemodynamics in the caudal artery of heifers fed diets with either endophyte (*Neotyphodium coenophialum*) infected (E+; $1.14 \mu\text{g}$ ergovaline/g DM), endophyte free (E-; $0 \mu\text{g}$ ergovaline/g DM), or a mixture of E+ and E- (E+E-; $0.38 \mu\text{g}$ ergovaline/g DM) tall fescue seed in a base ration of chopped alfalfa hay plus concentrate. Eighteen endophyte-naïve, Angus x Brangus heifers were stratified by BW into individual pens and fed the E- diet for a 7-d adjustment period. A 9-d experimental period followed with the 3 diets. Doppler ultrasound measurements (caudal artery area, heart rate, and flow rate) and blood samples for determination of serum prolactin were collected during the adjustment period (d 4, 5, and 7) to determine baseline measures, and during the experimental period at 3, 27, 51, 75, 100, 171, and 195 h from initial feeding of the diets. Statistical analyses compared proportionate differences between baseline and responses during the experimental period. Prolactin concentrations for the E- diet during the experimental period were similar to baseline concentrations, and Doppler measures were sporadic. Prolactin concentrations for the E+ and E+E- diets were less ($P < 0.05$) by 27 h and 51 h, respectively, and remained decreased until 195 h after initial feeding. Caudal artery area for the E+ diet was less ($P < 0.01$) between 27 and 171, and caudal artery area for the E+E- diet was less ($P < 0.01$) between 51 and 99 h. Reductions in heart rate with the E+ diet were only detected ($P < 0.05$) at 27, 99, and 171 h; no changes in heart rate were observed the E+E- diet. Blood flow rates for E+ and E+E- diets declined after 51 h, but increased to the baseline by 99 h for the E+E- diet and by 171 h for the E+ diet. Results indicated that reductions in blood flow rate through the caudal artery occur by 51 h after consumption of either low or high ergot alkaloid concentrations, even though vasoconstriction and heart rate responses were more sensitive to the higher alkaloid concentration. Doppler ultrasonography is a method to potentially establish threshold toxicity levels for the ergot alkaloids.

Key Words: Bovine, Fescue Toxicosis, Ergot Alkaloids

TH13 Analysis of locomotion scores with altered periparturient management. S. Eicher^{*1}, M. M. Schutz², J. Townsend², K. Daniels², S. Donkin², and A. Parkhurst³, ¹USDA-ARS, West Lafayette, IN, ²Purdue University, West Lafayette, IN, ³University of Nebraska, Lincoln.

The objective of this study was to evaluate locomotion scoring as a predictor of lameness in heifers and multiparous cows subjected to periparturient management change. Heifers were either milked 3 wk prior to expected calving or not milked until after calving. The multiparous cows were fed hyper alimentation, hypo alimentation, or control diets beginning on d -15 prior to expected calving until calving. Locomotion scores and lameness incidence were collapsed into pre- and post-calving scores for comparison because of infrequent incidence of lameness. The greatest factor tending ($P = 0.10$) to predict lameness was parity. Although speed was greater ($P < 0.05$) for control heifers, it did not predict lameness. However, persistence of lameness was correlated ($P < 0.05$) with speed following calving. Overfed cows had greater ($P = 0.001$) back arch scores than other treatments, suggesting that they may be experiencing pain associated with walking; but it was not a significant factor in predicting lameness. Odds Ratio analysis supported the ANOVA analysis. Discriminant analysis of 13 treatment-lameness categories indicated that hyper alimentation cows had greater incidence of lameness than the others. Control heifers were again found to have fewer incidence of lameness than control cows. The first canonical function, essentially a weighted average of all 5 treatments, correlated most strongly with back arch ($r = 0.914$, $P = 0.0285$) and speed ($r = 0.735$, $P = 0.001$). The second canonical discriminant function was primarily the difference between speed ($r = 0.507$, $P = 0.001$) and back arch ($r = 0.370$, $P = 0.007$). The third canonical discriminant function represented extremes of the significant correlations; head bob ($r = 0.835$, $P = 0.001$) and foot rotation ($r = 0.287$, $P = 0.039$). Prepartum milking did not affect lameness in heifers and feeding routine of cows only mildly affected incidence of lameness. Results accentuate the complexity of lameness and reinforce that it develops with time.

Key Words: Dairy Cattle, Lameness, Locomotion Score

TH14 Experimental haemonchosis in resistant and susceptible Creole kids. J. C. Bambou^{*}, E. González-García, C. de la Chevrotière, R. Arquet, N. Vachiéry, and N. Mandonet, INRA UR143 Unité de Recherches Zootechniques (URZ), Centre Antilles Guyane, Domain Duclos, 97170 Petit Bourg, Guadeloupe (French West Indies).

This study was developed to characterize the peripheral immune response during haemonchosis in goats by comparing genetically resistant and susceptible animals. We analysed the changes of circulating lymphocytes populations after experimental infection with *Haemonchus contortus* in sixteen nematode resistant ($n = 8$) and susceptible ($n = 8$) Creole kids (BW = 18.23 ± 4.56 kg) which were kept under confinement receiving an *ad libitum* diet based on a mix of tropical hay. Kinetics of faecal eggs count (FEC), packed cell volume (PCV), eosinophilia, as well as body weight (BW) changes, were weekly monitored. Flow cytometry was used to follow changes in peripheral blood mononuclear cell (PBMC) populations at early stage, 0, 3 and 35 days post-infection (d.p.i.). Data of FEC, PCV, eosinophilia and BW were analyzed by non-orthogonal contrast of SAS, while relative proportion of T lymphocyte (LT) sub-populations was compared across time by using GLIMMIX

(SAS, 2000). Main significant differences in eosinophils counts were detectable from the beginning until 7 d.p.i., afterwards, no differences were found. At the beginning, PCV values were lower in susceptible animals compared to resistant but at physiological level (31.5 and 28.9 respectively, $P=0.051$). These differences became higher from 21 d.p.i. onwards. Interestingly, from 21 to 35 d.p.i. FEC in resistant animals were significantly lower than in susceptible. Thus, at the end of the infection susceptible animals showed a FEC 11 folds higher than resistant ($P=0.031$). However, no evolution across time and no difference between resistant and susceptible kids were evidenced in circulating LTCD8+ and LTCD4+ sub-populations. Surprisingly, a significant decrease in CD4+ sub-populations was evidenced throughout the experiment in both groups, probably due to a mucosal localization of activated cells. The analysis of the local immune response in the abomasal mucosa could help to verify this hypothesis.

Key Words: Gastrointestinal Parasitism, *Haemonchus contortus*, Creole Goats

TH15 JDIP – Phase II. K. E. Olson*, *KEO Consulting, Schaumburg, IL.*

The Johne's Disease Integrated Program (JDIP) is a comprehensive consortium of academic, agency and industry researchers focused on

developing real-world solutions that will help producers deal more effectively with Johne's disease and mitigate potential losses. Currently in the third year of the original project, it is the first Coordinated Agricultural Project (CAP) proposal to receive approval for a second round of funding by the USDA-CSREES-NRI. Phase 2 funding will allow findings from the initial round of funding to be used to expand understanding of the transmission of the disease as well as potential new diagnostics, therapeutics and management tools that will allow producers to deal more effectively with the disease. Proposals approved for year four funding in the JDIP Core areas 1) Epidemiology and Biostatistics; 2) Diagnostics and Strain Differentiation; 3) Genomics, Antibodies and Proteomics and 4) Animal Models and Facilities as well as the Project areas of: 1) Epidemiology and Transmission; 2) Diagnostics and Strain Differentiation; 3) Map Biology and Pathogenesis; 4) Map Immunology and Vaccine Development and 5) Extension and Communication will be highlighted. Additional funding, made available by USDA APHIS VS, will fund projects over the next three years that are focused on identifying and validating potential Johne's vaccine candidates with the greatest likelihood of success in the field. An overview of work in this area will be included.

Key Words: Johne's, MAP, JDIP