two at day 1. Cleanliness was the most common reason to dock (73%), parlor milking (17%), and udder health (1%). Calves were raised by the owner on 50% of dairies, while 44% custom raise calves for at least a portion of the growing period. Only one producer sold calves and purchased heifers back pre-calving. Only 29% of dairies had heifers' custom raised during a portion of the milk feeding period. Satisfaction reported by producers regarding calf-raising was highly satisfied (51%), satisfied (31%), okay (8%), less than satisfied (6%), and need to change (3%).

Key Words: Calf, Dehorn, Tail-dock

Animal Health - Livestock and Poultry: Poultry/Swine/Goat/Sheep

T10 Colicin E1 prevents *Escherichia coli* F18 caused post-weaning diarrhea in pigs. S. A. Cutler*, N. Cornick, S. M. Lonergan, and C. H. Stahl, *Iowa State University*, *Ames*.

The use of dietary prophylactic antibiotics to prevent post-weaning diarrhea (PWD) in pigs is common practice in the U.S. swine industry. Despite this preventive measure, PWD still causes substantial losses to the swine industry due to both mortality and reduced growth performance in surviving pigs. With world-wide concern over the use of antibiotics in animal agriculture, alternatives to conventional antibiotics are desperately needed. The bacteriocin, Colicin E1 (ColE1), is effective against the *E. coli* strains responsible for PWD in vitro. In this study, we examined the efficacy of dietary inclusion of ColE1 in preventing experimentally induced PWD. Weaned pigs (n=16, 18d of age), all genetically susceptible to *E. coli* F18, were allocated into 2 groups, based on body weight, and fed corn-soy diets containing either 0 or 16.5mg ColE1/kg diet. After 2d on the treatment diets, all animals were orally inoculated with 1×10^9 CFU of 2 *E. coli* F18 strains isolated from pigs with PWD. Body weight (BW) and fecal scores were recorded daily, and *E. coli*. coli from rectal swabs were enumerated daily. All animals were euthanized 4d post-inoculation and sections of the ileum were collected for histology, *E. coli* enumeration, and gene expression. The inclusion of ColE1 decreased ($P\leq0.05$) the incidence and severity of PWD as demonstrated by the reduction ($P\leq 0.05$) in incidence of diarrhea (none in ColE1 fed pigs vs. 6 out of 8 in the controls). Inclusion of ColE1 improved ($P\leq0.05$) BW gain for ColE1 fed pigs compared to the controls (940g/d vs. 380g/d, respectively), and it is interesting to note that 3 control pigs, but none of the pigs fed ColE1, lost weight during this trial. Additionally, dietary addition of ColE1 reduced the gene expression of the cytokines *IL1*β ($P\leq0.02$), *iNOS* ($P\leq0.08$), and *TNF*β, ($P\leq0.06$) in ileal tissue compared to the control animals, suggesting a decreased inflammatory response in these pigs. Dietary inclusion of ColE1 appears to be an effective alternative to conventional antibiotics in the diet of swine for the prevention of PWD.

Key Words: Pigs, Colicin, PWD

T11 Evaluation of photonic imaging in the gastrointestinal tract of swine following oral inoculation with lux-modified *Salmonella typhimurium*. K. Moulton*[1], P. Ryan[1], R. Youngblood[1], M. McGee[1], S. Laird[1], A. Harris[1], D. Moore[1], I. Kim[1], D. Lay[2], and S. Willard[1], [1]*Mississippi State University*, *Mississippi State*, [2]*USDA-ARS*, *West Lafayette, IN*.

The objective was to evaluate photonic emitting bacteria through different segments of the gastrointestinal tract of swine. Pigs (~ 80 kg) were inoculated orally with 3.1 or 4.1×10^{10} CFU of *Salmonella typhimurium* transformed with plasmid pAK1-lux (S. typh-lux) for a 6 (n=6) or 12 (n=6) h incubation in vivo. Pigs were euthanized at 6 or 12 h. Intestinal regions (duodenum, jejunum, ileum, large intestine) were divided into 5 replicates of 4 segments (5 cm) each for imaging. For each replicate, two segments of each region were intact, while 2 segments were opened to expose the digesta. Sub-samples of digesta were analyzed for CFU, and images were analyzed for relative light units/sec (RLU/sec). At 6 h, a higher ($P<0.05$) concentration of emitting bacteria and consequently higher ($P<0.05$) detection of photonic emissions was observed in small intestine than large intestine. The correlations (6 h) of photonic emissions in opened segments to bacterial concentrations were r = 0.73, 0.62, 0.56, and 0.52 ($P<0.05$) in duodenum, jejunum, ileum, and large intestine, respectively. Photonic emissions were higher ($P<0.05$) in jejunum, ileum, and large intestine than in duodenum of intact segments post 6 h incubation. At 12 h, a higher ($P<0.05$) concentration of emitting bacteria in jejunum and ileum of open segments was observed than in duodenum and large intestine of open segments. Photonic emissions were higher in ileum than duodenum, jejunum and large intestine of open segments ($P<0.05$). The correlations (12 h) of photonic emissions in opened segments to bacterial CFU's were r = 0.71 and 0.62 for jejunum and ileum, respectively ($P<0.05$). At 12 h, a higher ($P<0.05$) concentration of emitting bacteria in jejunum and ileum of intact segments was observed than in duodenum and large intestine. These data indicate CFU were higher in small intestine after 6 and 12 h incubations, and a minimum of 2.0×10^5 CFU yields detection through these tissues (~ 1.0 to 21.0 RLU/sec). This study demonstrates feasibility of using biophotonics in research models for evaluating pathogenicity of *Salmonella* in swine.

Key Words: Swine, Biophotonics, *Salmonella*

T12 Development and optimization of species-specific PCR for rapid detection of Dermatophilus congolensis. S. Valipe, M. Amalaradjou, J. Nadeau*, A. Thirunavukkarasu, and K. Venkitanarayan, *University of Connecticut*, *Storrs*.

Dermatophilosis is a contagious and zoonotic disease in farm animals caused by *Dermatophilus congolensis*. Dermatophilosis is responsible for significant economic losses due to reduced milk production in cattle, wool losses in sheep, lameness and loss of days in showing horses. Accurate and rapid diagnosis of dermatophilosis is essential for specific therapeutic and preventive measures against the disease. The currently available methods for identification of *D. congolensis* are laborious and time-consuming; thus there is a need for a rapid method for detecting the bacterium. Polymerase chain reaction (PCR) is a highly specific and sensitive method used for the rapid detection of microorganisms. In this study, we developed a species-specific PCR to detect *D. congolensis* based on a 1029-bp internal, conserved region of its alkaline ceramidase gene. Chromosomal DNA from 8 strains of *D.congolensis* and 33 strains of negative control bacteria, including other common equine pathogens, environmental bacteria and

phylogenetically related bacteria were used as templates in the PCR. Amplification was carried out in 25-µL volumes of reaction mixture containing 2.5 mM $MgCl_2$, 50 mM of each nucleotide, 0.5 µM of each primer, 0.125 U of Taq polymerase and approximately 50 ng of template DNA from each bacterium. Initially the reaction mixture was heated to 94°C for 5 min and subjected to 30 cycles of PCR. Each PCR cycle consisted of denaturation at 92°C for 30 sec, annealing at 56°C for 45 sec and extension at 72°C for 45 sec. At the end of 30 cycles, a final extension at 72°C for 10 min was provided. The presence and the size of the PCR products were determined by agar gel electrophoresis. PCR amplified a 1029-bp DNA fragment from all the 8 strains of *D. congolensis*, but not from the negative control bacteria. Results indicate that the PCR developed in this study could potentially used for the rapid diagnosis of dermatophilosis, but it needs to be validated in farm animals.

Key Words: Dermatophilosis, PCR, Detection

T13 Necrotic Enteritis control in broilers chickens fed the feed additives RepaXol, AciXol, or Virginiamycin. G. Mathis*[1] and N. Scicutella[2], [1]*Southern Poultry Research, Inc.*, *Athens, GA*, [2]*SODA Feed Ingredients*, *Monaco*.

The objective was to compare the level of Necrotic Enteritis in Clostridium perfringens challenged broilers fed the feed additives RepaXol, a blend of double coated essential oils, AciXol an encapsulated blend of organic and inorganic acids along with the essential oils (as in RepaXol) or Virginiamycin, an antibiotic. A randomized block design with 6 replications of 10 birds per cage was used. The treatments were nonmedicated, non-challenged (NMNC), nonmedicated, challenged (NMC), RepaXol 100 ppm, AciXol 500 ppm, and Virginiamycin (VIR) 20 ppm. Birds were challenged on Day 14 with E. acervulina and E. maxima and on Days 19, 20, and 21 with Clostridium perfringens. The performance parameters measured were feed conversion and weight gain. Level of Necrotic Enteritis (NE) was determined by NE mortality and NE lesion scores. There was a significant improvement in feed conversions and weight gains for RepaXol, AciXol and VIR. The percent NE mortality for NMC was 33%. There was no significant difference in percent NE mortality between RepaXol (23%), AciXol (22%) and VIR (12%). All treatments had significantly lower NE lesion scores compared to NMC. This study demonstrated the benefits of adding RepaXol 100 ppm, AciXol 500 ppm, or Virginiamycin 20 ppm into the feeds of broiler chickens exposed to Clostridium perfringens.

Key Words: RepaXol, AciXol, Virginiamycin

T14 Molecular ecology effects of essential oil blends on identified broiler cecal digestive bacteria. Y. Leontieva*[1], A. Syvyk[1], A. Nalian[1], M. Hume[2], E. Oviedo-Rondon[3], S. Clemente-Hernández[4], and A. Martynova-Van Kley[1], [1]*Stephen F. Austin State University*, *Nacogdoches, TX*, [2]*USDA, ARS, SPARC, Food and Feed Safety Research Unit*, *College Station, TX*, [3]*North Carolina State University*, *Raleigh*, [4]*Universidad Autónoma de Chihuahua*, *Chihuahua, México*.

Essential oil blends are generating increased attention as alternatives to antibiotic treatments in broiler production. The aim of this study was to identify the intestinal microbial species most affected by different blends of essential oil supplements, Crina Poultry (CP) and Crina Alternate (CA). Cecal contents from three broiler treatment groups were analyzed: 1) birds on basal diet (BD); 2) birds on basal diet supplemented with (CP); 3) birds on basal diet supplemented with (CA). Digestive bacteria banding profiles were examined by the PCR-based denaturing gradient gel electrophoresis (DGGE). In order to carry out a conclusive phylogenetic identification of the species and to overcome the limitation of the sequencing of short fragment PCR products required for DGGE analysis, we generated clone libraries from longer ~520bp 16S rDNA PCR products. To select unique clones representing predominant and minor members of the bacterial community, PCR of short fragments (~250bp) was carried out using clone DNA as a template. The short PCR products were then screened using DGGE against the original field samples and unique short fragments and their corresponding clones were identified. Subsequently, clones containing long fragment and matching to DGGE bands affected by the presence of essential oil supplements in the broiler diet were selected for sequencing. This methodology provides a simple way of screening clone libraries to obtain longer and more useful sequencing data for phylogenetic identification of members of broiler digestive microbial population.

Key Words: Essential Oil Blends, DGGE, Microbial Community

T15 Electrospray-ionization mass spectrometric analysis of lipid restructuring in the chick liver: Effect of maternal dietary conjugated linoleic acid. G. Cherian*, *Oregon State University*, *Corvallis*.

The effects of egg yolk conjugated linoleic acid (CLA) on hatched chick liver phospholipid molecular species were determined by electrospray-ionization mass spectrometry. Eggs with no, low or high levels of CLA were produced by feeding hens a corn-soybean meal basal diet containing 3% (wt/wt) corn oil (Control), 2.5% corn oil +0.5 % CLA oil (CLA1) or 2% corn oil + 1.0% CLA oil (CLA2).Yolk total CLA was 0.0, 1.0 and 2.6% for Control, CLA1 and CLA2, respectively ($P<0.05$). Chicks hatched from CLA1 and CLA2 eggs incorporated higher levels of cis9, trans11 CLA in the liver than did chicks from Control ($P<0.05$). A 21 and 38% reduction in the abundance of total phosphatidylethanolamine (PE) species was observed in the liver of CLA1 and CLA2 chicks respectively, as compared to Control chicks ($P<0.05$). The largest observed change in PE was a 32% decrease in 18:0/20:4 ($P<0.05$). Total phosphatidylcholine (PC) in the liver of CLA1 and CLA2 chicks was reduced by 16 and 28% respectively, when compared to Control chicks ($P<0.05$). The major changes in PC were a 40% reduction in the abundance of 18:0/20:4 ions in CLA1 and CLA2 ($P<0.05$). Significantly reduced 16:0/18:1 and 16:0/20:4 ions were also observed in the PC of CLA1 and CLA2 than Control ($P<0.05$). Significant increases in the abundance of 16:0 and 18:0 in the lyso PC and lyso PE were observed in CLA1 and CLA2. These results suggest that maternal or egg yolk CLA results in a remodeling of phospholipid molecular species in the chick liver. Though very little is known about the physiological or pathological role of specific molecular species during embryogenesis, it is likely that this remodeling will impact a range of cellular functions affecting embryo health and hatchability.

Key Words: Electrospray Ionization Mass Spectrometry, Conjugated Linoleic acid, Phospholipid Species

T16 Maternal dietary n-3 fatty acids alter proinflammatory eicosanoid production in broiler birds. J. Bautista-Ortega*, D. E. Goeger, and G. Cherian, *Oregon State University*, *Corvallis*.

The objective of this research was to evaluate the contribution of a maternal diet enriched with omega-3 fatty acids on eicosanoid metabolism and antioxidant enzyme activities in broiler birds. Fertile eggs with high or low n-3 fatty acids were obtained by feeding breeder hens diets containing 3.0% sunflower oil (Low n-3), 1.5% sunflower oil and 1.5% fish oil (Medium n-3), or 3.0% fish oil (High n-3). These oils were chosen due to their high content of n-6 or n-3 fatty acids. The hatched chicks were fed a commercial diet devoid of long chain n-3 fatty acids. On the day of hatching, generation of proinflammatory eicosanoid (prostaglandin E2) was highest in the heart tissue of Low n-3 chicks ($P<0.05$). Heart tissue of chicks hatched to hens fed High and Medium n-3 diets synthesized higher thromboxane B3 than those of Low n-3 chicks ($P<0.05$). At day 42 of growth, prostaglandin E2 and thromboxane B2 (proaggregatory) generation was highest in the cardiac ventricles of chicks hatched to hens fed Low n-3 diets ($P<0.05$). Weight of the ventricle as a percentage of heart weight was higher in Low n-3 birds as compared to High n-3 birds. Chicks hatched to hens fed High n-3 diets had lower catalase activity in their heart tissue than did Low n-3 chicks ($P<0.05$). Maternal diet did not alter the activities of glutathione peroxidase, total glutathione, glutathione reductase or superoxide dismutase in the heart tissue. On day 42, the total lipid content of plasma was lowest in High n-3 birds ($P<0.05$). These results indicate that maternal dietary n-3 fatty acids alter proinflammatory eicosanoid production in chicks, which could lead to fewer inflammatory-related disorders in broiler chickens.

Key Words: n-3 Fatty Acid, Eicosanoid

T17 Immunomodulatory potential of feed borne *Fusarium* mycotoxins in broiler breeders Iinfected with coccidia. G. N. Girgis*, T. K. Smith, S. Sharif, J. R. Barta, and H. J. Boermans, *University of Guelph*, *Ontario, Canada,*.

The potential for *Fusarium* mycotoxins to modulate immunity was studied in broiler breeders raised to 10 weeks of age using a coccidia infection model. Day-old breeders were randomly divided into 3 groups, 40 birds each. Diets included: (1) control (2) contaminated grains (3) contaminated grains + a polymeric glucomannan mycotoxin adsorbent (GMA, Mycosorb®, Alltech Inc., Nicholasville, KY). Contaminated diets contained up to 3.8 ppm deoxynivalenol (DON), 0.3 ppm 15-acetyl DON and 0.2 ppm zearalenone. Half of the birds in each group were orally inoculated at 8 weeks of age with a cocktail comprising *Eimeria acervulina*, *E. maxima* and *E. tenella*. Serum, whole blood and caecal tonsils were collected from all birds prior to inoculation, at the end of challenge period (7 days post inoculation, PI), and at the end of recovery period (14 days PI). Serum IgA levels in infected birds fed contaminated diet were found to be significantly reduced at the end of recovery period. Flow cytometry of isolated blood lymphocytes revealed that CD8+ cell populations in the same birds were significantly lower than controls. Using real-time PCR, interferon-γ gene expression in caecal tonsils at the end of challenge period was significantly higher in birds fed contaminated and GMA-containing diets compared to birds fed the control diet. It was concluded that *Fusarium* mycotoxin-induced immunomodulation involves intestinal immunity and interferes with recovery from *Eimeria* infection.

Key Words: *Fusarium*, immunity, coccidia

T18 Broiler performance on a Maxiban® anticoccidial program with exposure to a mixed *Eimeria* population. A. Barri[1], C. L. Novak[1], H. D. Danforth[2], S. J. Steinlage[3], and A. P. McElroy*[1], [1]*Virginia Polytechnic Institute and State University*, *Blacksburg*, [2]*USDA/ARS*, *Beltsville, MD*, [3]*Elanco Animal Health*, *Greenfield, IN*.

This study compared inclusion of Maxiban® in the diet to *Eimeria* vaccination for broiler performance during exposure to a mixed environmental coccidia exposure. The 37-d day trial consisted of three treatment groups (n=540/trt): negative control (CON; non-medicated diet/no vaccination), Maxiban diet (MAX; 72g starter, 81g grower, 0g finisher) and a group vaccinated (VAC) with a commercial live *Eimeria* vaccine. Evaluation included body weight (BW), BW uniformity and gain (BWG), feed intake, mortality, adjusted feed conversion (FC), intestinal lesion scores, and tensile strength. Prior to this trial, birds challenged with a mixed *Eimeria* population were placed in pens to seed the litter. MAX or VAC resulted in heavier ($P<0.05$) BW as compared to CON for the starter period (d0 to18), and MAX broilers were heavier than CON or VAC on d37. On d18 and d32 MAX resulted in more uniform BW as compared to CON, while VAC birds were not different from CON or MAX. MAX resulted in increased BWG overall as compared to CON, and MAX or VAC resulted in increased BWG for d0-18 in comparison to CON. No differences in BWG were observed for the grower (d19 to 32) or finisher (d33 to 37) periods. During all periods, MAX had better FC as compared to CON. For d0 to 37, MAX (1.64) resulted in the most efficient FC as compared to VAC (1.68), as an intermediate, or CON (1.74). FC of VAC birds was better than CON for d0 to 18, while it was intermediate to MAX and CON for d33 to37. MAX had lower mortality (%) in the starter (2.0) and grower (1.2) periods as compared to CON (20.6 and 17.5). For these periods, mortality of VAC birds (4.4 and 5.3) was not different from either CON or MAX. For d0 to 37, MAX (4.0) and VAC (9.9) had lower mortality than that of CON (33.1). MAX had less severe *E. maxima* and *E. tenella* as compared to CON. Similarly, VAC broilers had less severe lesions for *E. tenella*. No differences were observed for *E. acervulina* lesions or tensile strength. These data suggest that MAX, and to a lesser extent VAC, improved performance of broilers exposed to a mixed environmental *Eimeria* population as compared to non-medicated, non-vaccinated broilers.

Key Words: *Eimeria*, Broilers, Vaccination

T19 Rapid detection of avian reoviruses in cloacal swabs using real-time RT-PCR. K. Guo*, T. Dormitorio, and J. Giambrone, *Auburn University*, *Auburn, AL*.

Avian reoviruses (ARV) can cause a variety of diseases, such as tenosynovitis, malabsorption syndrome, chronic respiratory disease, and immunosuppression in young commercial poultry. Therefore, early detection is critical for proper vaccination and prevention of ARV infections. In the current study, we applied the previously reported Sigma NS primer-probe set, which was designed by our lab, for the

detection of the ARVs in cloacal swab samples, from infected chickens with the Roche LightCycler. Preliminary studies indicated that this method identified 60% of the swab samples as positive at 3-day post-infection (PI) with an ARV strain 2408. At 7-day post-infection, 40% were detected positive with this method. The whole process of sample collection, RNA extraction, and real-time RT-PCR was completed within 4hrs, compared with virus isolation in cell culture or embryos, which takes up to 3days. This technique can be used for the rapid detection of ARVs in the diagnostic laboratory.

Key Words: Avian Reovirus, Real-time RT-PCR, Cloacal Swab Sample

T20 Development of a polymerase chain reaction assay for rapid identification of the causative agent of ulcerative enteritis. L. Bano*[1], K. S. Macklin[2], S. W. Martin[2], R. S. Miller[2], R. A. Norton[2], O. A. Oyarzabal[2], and S. F. Bilgili[2], [1]*Istituto Zooprofilattico Sperimentale delle Venezie*, *Treviso, Italy*, [2]*Auburn University*, *Auburn, AL*.

Clostridium colinum is the causative agent of ulcerative enteritis (UE), an important disease of bobwhite quail (Coluinus virginianus). UE has been reported also in chickens between 4 and 25 weeks of age, with a mortality rate of up to 50%. The aim of the present study was to develop a polymerase chain reaction (PCR) assay specific for C. colinum and to determine the detection limit of this assay in artificially inoculated fecal material. The 16S rDNA sequences of C. colinum, C. disporicum and C. piliforme were aligned and two primers were developed that would react only with C. colinum. The specificity of these primers were tested with American Type Culture Collection (ATCC) strains of C. colinum, C. perfringens, C. sporogenes, C. septicum and C. sordelii. The expected amplified product (935 bp) was observed only with DNA from C. colinum. Results from performing PCR assays on fecal samples from quails spiked with different concentrations of C. colinum showed that the detection limit of the assay was 1.6 x 104 CFU of C. colinum per g of fecal material. This PCR assay can be used in diagnostic laboratories to confirm the presence of C. colinum from pure cultures, and to screen enriched samples or fecal samples for the presence of C. colinum. This assay can also be formatted into an in situ PCR for detection of C. colinum in tissue samples or adapted to a real time PCR for a large screening of enriched or fecal samples.

Key Words: Clostridium Colinum, Bobwhite Quail, Ulcerative Enteritis

T21 Effect of oral administration of *Lactobacillus brevis* on turkey poult performance and immune development. K. Novak*, E. Davis, K. Bos, T. Rehberger, and C. Kromm, *Agtech Products, Inc.*, *Waukesha, WI*.

Immune cell populations in turkey poults were evaluated at d 9, 16, and 37 post-placement in response to dosing with a porcine-derived *Lactobacillus brevis* for the first three days of the brooder phase. Four brooder houses on a commercial turkey farm were evaluated and two treatments were administered orally through the water, such that two brooder houses received *L. brevis* in the water for the first three days after placement, and the other two houses served as controls. Six poults from each house were bled and euthanized at d 9, 16, and 37. Peripheral blood mononuclear cells and intraepithelial lymphocytes from the duodenum were evaluated by flow cytometry to determine T cell subpopulations as defined by the cell surface markers, CD4 and CD8. Poults provided with *L. brevis* had greater ($P = 0.08$) ADG from placement to d 9, but this effect diminished later in the brooder phase such that control birds had greater ($P < 0.01$) ADG from d 9 to 16. The double positive T cell population ($CD4^+CD8^+$) in the peripheral blood did not differ between control and *L. brevis* supplemented birds at d 9, but was greater ($P \leq 0.05$) at d 16 and 37 in *L. brevis* supplemented birds compared to control birds (treatment x day interaction, $P = 0.06$). The $CD4^+$ population in the peripheral blood was lower ($P = 0.08$) in *L. brevis* supplemented birds at d 9 compared to control birds, but was greater ($P \leq 0.07$) than control birds at d 16 and 37 (treatment x day interaction, $P = 0.06$). The $CD8^+$ population in the duodenum did not differ between control and *L. brevis* supplemented birds at d 9, but was lower ($P = 0.02$) at d 16 and greater ($P = 0.09$) at d 37 in the *L. brevis* supplemented birds than control birds (treatment x day interaction, $P = 0.04$). The results of this study indicate that *L. brevis* supplementation to turkey poults at an early age has the potential to improve growth response in the brooder phase and enhance immune development in the gastrointestinal tract and in the peripheral blood. However, duration and timing of administration should be further explored to maintain the performance benefits of early supplementation.

Key Words: Poultry, Probiotic, Immunity

T22 Evaluation of the efficacy of a bio-hygienic additive in ammonia level control in broiler houses. G. Tacconi[1], A. Zanierato*[2], and A. Covarelli[1], [1]*University of Perugia*, *Perugia, PG, Italy*, [2]*SOP Srl*, *Busto Arsizio, VA, Italy*.

The present field study investigates the efficacy of a new bio-hygienic bedding additive (SOP C POULTRY) in ammonia control in broiler houses. Bedding is considered one of the major sources of pollutants; in particular, ammonia often reaches high levels causing limited poultry performance and environmental pollution; the need to manage this using additives, has been considered for the last few years but has not resolved the situation conclusively. This study was carried out during 2003-2006 in an Italian commercial poultry farm. Two large broiler houses, control (C) and treated (T), were selected for their similarity in size, density, ventilation system, drinking and eating equipment. The buildings had a conventional layout and housed about 8,200-8,600 1 day old broiler chicks each cycle, to 7-8 weeks. Bedding consisted of 5-7cm deep wheat straw, regularly changed at the end of each cycle, and treated (T) covering the surface with the additive at a dosage of 2g of additive plus 25g of calcium carbonate (to enable even distribution) per m^2, the day before the chicks' housing and repeated twice a month during the 1st month; after, 1g of additive plus 25g of calcium carbonate per m^2 twice a month, until the end of each cycle. Ammonia concentrations were assessed in each house using Draeger PAC-III (PA-USA) in the 1st and 7th weeks, in six different points. The ammonia mean values of the ten cycles were, in house C and T respectively, in the 1st week 3.90 ± 3.05 ppm and 3.26 ± 3.91 ppm, and in the 7th week 19.07 ± 12.41 and 7.12 ± 4.39. The difference between the mean values was low (P=0.09) in the 1st week, but resulted in a 17.00% reduction; the reduction in the 7th week was significant (P=0.002) 62.9%. The control of ammonia levels in commercial poultry houses is essential in order to: improve the air quality in the housed environment; improve health, performance and welfare of both animals and

human attendants; reduce significantly the environmental ammonia emissions.

Key Words: Ammonia, Poultry, Bedding

T23 Characterization and expression of the ryanodine receptor 2 gene in furazolidone induced cardiomyopathic turkeys. E. Ndegwa* and M. M. Corley, *Tuskegee University*, *Tuskegee, AL*.

Intracellular calcium acts as a secondary messenger involved in signal transduction in almost all body cells and is a major player in contraction and relaxation in muscle cells. Altered calcium cycling is a major hallmark of end stage heart disease and has been linked to altered expression of the calcium cycling proteins. The cardiomyopathic turkey and human hearts have been shown to be similar in terms of the patho-physiological, gross and microscopic lesions. Therefore, investigation of genes involved in turkey cardiomyopathy can lead to further insight into cardiovascular disease in turkeys and serve as a good model for the human condition and thus benefit both the poultry industry and the human population. In this study, we attempted to identify and characterize the ryanodine receptor 2 gene from turkeys that carry a genetic trait (unknown) which renders them susceptible to cardiomyopathy. The ryanodine receptor is the main calcium channel that releases calcium from sarcoplasmic stores in the heart. The expression of this gene as it relates to heart disease in turkeys has not been investigated. Cardiomyopathy was induced in 25 three week old turkey poults by feeding furazolidone (600ppm) over a five week period. A control group (25) was fed regular turkey chick starter without the Furazolidone. Reverse transcriptase polymerase chain reaction (RT-PCR) was performed on total RNA from 0.1g of cardiomyopathic and non cardiomyopathic turkey heart tissue. Primers were designed from the chicken ryanodine 2 gene. The expected 576 bp cDNA fragment was successfully amplified. Nucleotide sequencing will provide verification of this gene. Expression studies will give further insight into the dynamics of the ryanodine 2 gene in cardiomyopathic turkeys and their suitability as a genetic model for human cardiovascular disease.

Key Words: Ryanodine 2, Cardiomyopathy, Turkeys

T24 The effect of anti-coccidiosis antibody on growth performance in broiler chicks. E. Hellestad*, J. Susko-Parrish, and M. E. Cook, *University of Wisconsin*, *Madison*.

A study was conducted to determine the ability of anti-coccidia egg antibody to prevent growth depression resulting from a coccidia challenge. Treatments consisted of control or coccidia challenged chicks factorially arranged (2x2) with adjuvant control egg yolk or anti-coccidiosis egg yolk. 10 pens of 5 chicks were assigned to each experimental treatment. The oral challenge consisted of either 0.2ml water (C) or 0.2 ml 10X commercial coccidiosis vaccine (V) containing viable oocysts of *Eimeria acervulina*, *Eimeria maxima* and *Eimeria tenella* at 0,7, and 14 days. The dietary treatments consisted of freeze dried yolk powder from adjuvant or adjuvant plus coccidia injected hens. The control yolk powder (C) came from hens injected with an emulsion containing Freund complete adjuvant on day 0 and Freund incomplete adjuvant on day 7. Anti-coccidiosis egg yolk (AB) was obtained from hens injected as described above, with the emulsion containing the commercial coccidiosis vaccine at 3mg protein/ml emulsion. Yolks from eggs collected 21-30 days after initial vaccination were freeze dried, powdered and added to a standard chick diet at 1g dried yolk/kg feed. Chicks receiving the vaccine and control diet (V/C) gained significantly less weight over 3 weeks than chicks receiving no vaccine and the control diet (C/C: 574g ±17 vs. 636g ±17, $p<0.05$). Chicks receiving the vaccine and AB diet (V/AB) gained significantly more weight over 3 weeks than the V/C chicks (621g±30 vs. 574g±17, $p<0.05$). V/AB chicks were not significantly different from C/C chicks or chicks on the antibody diet (C/AB) over 3 weeks (621g±30 vs. 636g±17 or 654g±30, $p=0.5$). There were no significant differences in feed efficiency between treatments (C/C= 0.65, V/C=0.65, C/AB=0.66, V/AB=0.65). The growth depression observed in chicks infected with coccidiosis was overcome with the addition of egg yolk containing anti-coccidiosis antibody to the diet.

Key Words: Egg Antibody, Coccidiosis, Broiler Chicks

T25 Oxidative stress and toxin-induced dilated cardiomyopathy in the turkey (*Meleagris gallopavo*). K. Gyenai*, J. Xu, T. Geng, L. Pyle, and C. Larson, *Virginia Polytechnic Institute and State University*, *Blacksburg*.

Dilated cardiomyopathy (DCM) or round heart disease is a muscle disease of the heart which is characterized by ventricular dilatation and abnormal systolic and diastolic left ventricular function. In animals, including turkeys and humans, DCM is the major cause of morbidity and mortality which results from heart failure. In the turkey, DCM can be idiopathic or induced. Here, our primary objective was to determine the effect, if any, of oxidative stress on the incidence and severity of toxin-induced DCM in the commercial turkey. Using glutathione (GSH), malondialdehyde (MDA), and plasma uric acid (PUA) as biomarkers, oxidative stress levels in DCM-affected and -unaffected poults fed varying concentrations of Vitamin E and selenium were also evaluated. Results from the MDA and GSH measurements were inconsistent. However, PUA levels increased by 5-fold between two and four weeks of age in birds fed furazolidone while the increase in non-furazolidone fed control birds was about 150 fold. The effect on the increase in antioxidant status though significant was not consistently affected by feeding either Vitamin E or selenium. Combined with the mortality data, the present work appears to suggest that DCM appears to influence the level of oxidative stress in turkeys.

Key Words: Turkeys, Oxidative Stress, Dilated Cardiomyopathy

T26 Effect of a *Bacillus*-based direct-fed microbial on turkey poult performance and changes within the gastrointestinal microflora. S. Gebert*, C. Kromm, and T. Rehberger, *Agtech Products, Inc.*, *Waukesha, WI*.

Two studies were conducted to evaluate the effect of a *Bacillus*-based direct-fed microbial (DFM) on poult performance and on the gastrointestinal microflora. In both studies, the DFM was incorporated into a standard turkey diet in a commercial facility in the Midwest to provide 4.75×10^4 CFU/g of treated feed. The first study was conducted to evaluate the duration of feeding the DFM on poult performance.

The DFM was fed from placement until the first five weeks of age at 17 sites and from placement to market at 24 sites. Performance was evaluated at market age. The adjusted feed conversion was improved (P = 0.10) in poults fed the DFM from placement to market compared to poults fed the DFM for only the first five weeks after placement. An additional study was conducted in which the poults were fed a standard commercial diet (control) or the control diet supplemented with the DFM from placement to market, and the gastrointestinal microflora was evaluated. Twelve control poults and 10 poults treated with the DFM were euthanized and gastrointestinal tracts were sampled to enumerate avian pathogenic *Escherichia coli* and *Clostridium perfringens* type A. Avian pathogenic *E. coli* encompass a division of pathogenic *E. coli* that cause colibacillosis in young turkey poults. *Clostridium perfringens* type A is an enteric bacterial pathogen and is the major contributing factor associated with necrotic enteritis in poultry. Avian pathogenic *E. coli* and *C. perfringens* type A levels did not differ between control and DFM supplemented poults at 9 weeks of age. However, at 18 weeks of age, supplementation with the DFM reduced avian pathogenic *E. coli* (1.6×10^7 vs. 2.0×10^4 CFU/g; $P < 0.01$) and *C. perfringens* type A (1.9×10^6 vs. 3.6×10^3 CFU/g; $P < 0.01$) compared to control birds. These results indicate that supplementation with a *Bacillus*-based DFM from placement to market improves feed conversion and beneficially alters the gastrointestinal microflora of turkey poults.

Key Words: Poultry, Probiotic, Gastrointestinal Microflora

T27 *Campylobacter jejuni* Colonization Alters Mucin Dynamics And Gut Architecture In Broilers. F. Solis de los Santos*[1], M. L. Dirain[1], P. J. Blore[1], I. Reyes-Herrera[1], A. M. Donoghue[2], and D. J. Donoghue[1], [1]*University of Arkansas*, *Fayetteville*, [2]*Poultry Production and Product Research Unit, Agricultural Research Unit*, *Fayetteville, AR*.

Campylobacter is a significant foodborne pathogen. To our knowledge, the impact of *Campylobacter* colonization on enteric morphology has not been evaluated. Understanding how *Campylobacter* may affect the gut might provide insights into ways to reduce its colonization. To this end, day old chicks (n=108) were randomly allocated in 6 sterile isolators. At d 14, 3 groups of birds (n=36 per group) were orally challenged with 10^6cfu/mL of *C. jejuni*, 10^4 cfu/mL *Salmonella* enteriditis (positive enteric pathogen control) or nothing (negative control), respectively. Six birds from each group were randomly selected at d 7, 14, 21, 28, 35 and 42 for *C. jejuni* enumeration and *Salmonella* detection in the ceca and determination of mucus thickness, villus and crypt depth and goblet cell number and type in the duodenum, jejunum, ileum and ceca. *Campylobacter* and *Salmonella* were detected at d 21, 28, 35 and 42 while negative control birds remained pathogen free. *C. jejuni* colonization decreased mucus thickness in the ileum and ceca on d 42 compared to Salmonella colonized birds and negative control. Ileal acidic goblet cells were reduced in *C. jejuni* and *Salmonella* birds compared to negative control on d 42. Ileal acidic goblet cells were lower in the ceca of *C. jejuni* birds compared to *Salmonella* and negative control on d 35. Ileal sulfuric goblet cells were higher in *C. jejuni* and *Salmonella* treated birds compared to negative control on d 35 and 42. Furthermore, cecal sulfuric goblet cells were higher in *C. jejuni* birds compared to *Salmonella* and negative control on d 28 and on d 42. Ileal crypt depth was lower in *Campylobacter* and *Salmonella* treated birds compared to negative control on d 42. Cecal crypt depth was lower in *C. jejuni* compared to *Salmonella* on d 35 and on d 42 compared to *Salmonella* and negative control. This study suggests that *C. jejuni* colonization alters mucin dynamics and gut architecture in broiler chickens reared in isolation units.

Key Words: *Campylobacter*, Isolator, Mucin

T28 Dietary soybean oil adjust protein and mineral metabolism and antioxidant enzyme activity in male broiler chicks during inflammatory response. T. S. Koh*, C. R. Choi, M. J. Chang, K. C. Lee, and S. Y. Kim, *Konkuk University*, *Seoul, South Korea*.

In order to study an effect of dietary soybean oil on protein metabolism during inflammatory response, two experiments were conducted in male broiler chicks. In experiment 1, Dietary soybean oil decreased urinary nitrogen (UN) in excreta, and improved BV (protein retention/AN) of protein and ash retention, but did not altered digestibility of protein. In experiment 2, compared with birds fed basal diet, in broiler chicks activated inflammatory response, soybean oil 5.0% diet increased daily gain, and feed efficiency, dietary protein utilization (NB/NI; BV:NB/absosbed N) ($p<0.05$), activity($p<0.05$) of CuZnSOD or MnSOD in erythrocyte cytosol, and activity of ceuloplasmin in liver cytosol and plasma. Also soybean oil 5.0% diet decreased fecal nitrogen (FN/NI) and urinary nitrogen (UN/NI) in excreta ($p<0.05$) but did not affect dietary calcium or phosphorus balances. Compared with control birds, in birds fed soybean oil 5.0% diet, the inflammatory response did not affect daily gain and feed efficiency, the excretion of FN/NI or UN/NI, NB/NI and BV of dietary protein, calcium or phosphorus balances, and CuZnSOD activity in liver cytosol, but reduced the feed consumption and significantly the MnSOD activity in liver cytosol, and increased significantly the CuZnSOD or MnSOD activity in erythrocyte cytosol and tended to enhance the ceruloplasmin activity in plasma but in liver cytosol. These results indicated that the improvement (extra calorific effect) of assayed ME value in soybean oil was partly due to decreased heat increment by enhanced lipid retention and biological value of dietary protein and ash retention. And the alleviatin of inflammatrory response in broiler chicks fed dietary soybean oil is interacted with decreased protein decomposition and changed activities of superoxide dismutase and ceruloplasmin

Key Words: Inflammatory Response, Biological Value of Protein, Antioxidant Enzyme Activity

T29 Prevalence of gastrointestinal parasites in sheep of the Brisas Town, Culiacán, Sinaloa. M. C. Rubio Robles*, S. M. Gaxiola, C. N. Castro, D. J. Zazueta, G. A. Felix, and E. Sanchez, *Universidad Autonama de Sinaloa*, *Culiacan, Sinaloa, Mexico*.

The objective of this work was to determine the prevalence of gastroenteric parasites in ovine of the town the Brisas, municipality of Culiacán, Sinaloa, which counts on a total of 260 animals (163 adults and 97 young); the sampling was representative in each explotaction, considering itself the young and adults without determining the race and cradle in the technique of sampling of population described by Thrusfield (1995), that is next: Where: n: sample size, t: value of the normal distribution (t of Student) for a level of confidence of 95% (t it is 1.96), L: accepted error or precision (5%), SD: "waited for

Prevalence of disease (%). On the basis of the mentioned technique the total number of samples animals was of 59; of each ovine were collected feces of the rectum of the animal directly, using plastic bags previously identified. The samples was transported under refrigeration to 4º C and it was sent to the Parasitology laboratory of the FMVZ-UAS, where process by the sedimentation technique; being the 100% from the positive samples to gastroenteric parasites with a prevalence of 94.9% (56 ovines) to some of the following parasites: 78.8% (46) positives to Eimeria spp., 35.6% (21) to Moniezia spp., 11.9% (7) Strongyloides spp. 8.5 % (5)Haemonchus spp., 6.8 % (4) to Buxtonella spp and 3.4% (2) to Trichuris spp. it is concluded that exists high prevalence of gastroenteric parasites in ovines in the town of Brisas, municipality of Culiacán, in the state of Sinaloa. Reason why is advisable to make studies in which determines the parasitic quantity as well as its effects in the ovine production.

Key Words: Parasites, Ovines, Prevalence

T30 Presence of *Mycoplasma sp.* in lambs with lung lesions. J. A. Daniel*[1], J. E. Held[2], and L. Holler[2], [1]*Berry College*, *Mount Berry, GA*, [2]*South Dakota State University*, *Brookings*.

Previous research in cattle and sheep has indicated that lung lesions result in decreased animal growth, and lung lesions in sheep are often associated with *Mannheimia haemolytica* and *Pasteurella multocida* infection in the lungs. The purpose of this research was to identify other bacterial agents associated with lung lesions. White-faced, Polypay-sired, February born wether lambs from the South Dakota State University (SDSU) Sheep Unit were utilized for this study (n = 76). After weaning, lambs were fed a high concentrate finishing diet *ad libitum* in the same barn with natural ventilation. Lambs were transported to a commercial packing plant in two groups for harvest. The first group was harvested when a minimum of 30 lambs were estimated to have a hot carcass weight over 27.2 kg, and the second group was harvested when 66% of the remaining lambs were estimated to have a hot carcass weight over 27.2 kg. Lungs were collected at slaughter, and transported on ice to the SDSU Animal Disease Research and Diagnostic Laboratory. Lungs were classified as having normal (<5 % consolidation of any lobe; n = 13), moderate lesions (5-50% consolidation of any lobe; n = 8) or severe lesions (>50% consolidation of any lobe; n = 61). A portion of the right cranial lobe of each lung was collected. Samples of lungs were cultured aerobically and for *Mycoplasma sp.* As observed previously, culture analysis confirmed the presence of *M. haemolytica* and *P. multocida*. Additionally, *Mycoplasma sp.* were detected. Data were tested for effect of lung lesion prevalence or severity on the detection of *Mycoplasma sp.* by Chi square analysis. *Mycoplasma sp.* was cultured from a greater percentage of lungs with lesions than normal lungs (51% vs. 15% respectively, $P = 0.04$). However, the severity of the lung lesions did not affect the percentage of lungs which had positive cultures for *Mycoplasma sp.* (38% vs. 53% for moderate vs. severe lung lesions, $P = 0.42$). These results indicate *Mycoplasma sp.* may play a role in the formation of lung lesions.

Key Words: Lambs, Lung lesion, *Mycoplasma sp.*

T31 Effects of herbal and chemical deworming agents on internal parasite control comparing fecal egg counts, hematocrits and FAMACHA(R) on sheep and goats. H. Swartz*[1], A. Stewart[1], F. Wulff[1], D. Sommerer[1], and M. Ellersieck[1,2], [1]*Lincoln University*, *Jefferson City, MO*, [2]*University of Missouri*, *Columbia*.

An herbal dewormer was compared with the commercial Ivomec dewormer in two groups of sheep and a group of Boer/cross goats plus a control group in 2006. Katahdin hair sheep, Dorset wool sheep and Boer/cross goats (n=36) were fed herbs consisting of 40.5% wormwood (Artemisia sp.), fennel (Foeniculum vulgare), gentian (Gentian sp.), psyllium (Plantaga sp.) and quassia (Quassia sp). All treatment groups were dewormed with Cydectin at the beginning of the project. Herbs were fed to the three breeds once a week in a corn based ration from June through October. Ivomec was drenched every 30 days from July through October to both the Katahdin and Dorset sheep at the rate of 3 ml to 11.8 kg body weight and Boer/cross goats at the rate of 4.5 to 11.8 kg body weight. The control group received no treatment. Fecal eggs counts (FEC) were collected at the beginning of the project in all three treatment groups, hematocrits and FAMACHA® were scored at the same time throughout the project. Results of breed differences in FEC, hematocrits and FAMACHA® statistically reported ($P<.0001$), lowest count in the Katahdin and highest in the Dorset, over time ($P<.0001$) and interactions of breed x time x treatment ($P<.0001$). The FEC peaked in July, hematocrits and FAMACHA® readings lowered showing the Hoemonchus contortus barberpole blood sucking stomach worm a hot weather worm. Seasonal differences were also observed in the hematocrits and FAMACHA® results in breed, time and treatment in the trial. The results of this study suggest that herbs are effective in controlling internal parasites in Katahdin sheep and Boer goats throughout the hot summer months.

Key Words: Herbs, FAMACHA®, Deworming

T32 Indirect contact: A possible dissemination route of Caprine arthritis encephalitis among goat kids. A. Asmare*[1,2], K. E. Washburn[3], J. T. Saliki[4], A. L. Goetsch[1], L. J. Dawson[5], R. C. Merkel[1], and T. Sahlu[1], [1]*E (Kika) de la Garza American Institute for Goat Research, Langston University*, *Langston, OK*, [2]*Alemaya University*, *Dire Dawa, Ethiopia*, [3]*Texas A&M University*, *College Station*, [4]*Oklahoma Animal Disease and Diagnostic Laboratory*, *Stillwater, OK*, [5]*Oklahoma State University*, *Stillwater*.

Twenty Alpine goat kids were randomly assigned to four groups of five animals. Kids were removed from their dams at birth and penned individually. Kids in all groups were fed colostrum during the first 48 h after birth. Group 1 was fed Caprine arthritis encephalitis virus (CAEV) free colostrum, Group 2 received CAEV positive colostrum, Group 3 consumed CAEV positive colostrum subjected to conventional heat treatment, and Group 4 was given CAEV positive colostrum treated with methylene blue and fluorescent light. Thereafter, all kids were fed pasteurized goat milk until weaning. No CAEV specific antibodies were detected in serum of any kids collected prior to colostrum consumption. Despite efforts to aviod vertical transmission of the virus among kids , three goat kids of Group 1 showed seroconversion at the age of 48 h and the remaining two kids displayed seroconversion at 2 months of age. All animals in Groups 2, 3, and 4 had seroconvertion at the age of 48 h. Presence of CAEV was confirmed in 17 kids (85%) by polymerase chain reaction at the age of 1.5 months. The early appearance of CAEV specific antibodies was

probably caused by consumption of antibody containing colostrum and maintenance of maternal antibodies. Results of this study suggest that factors other than direct contact of kids with their dams i.e. ingestion of infected colostrum and milk could be means of CAEV transmission. Therefore, the risk of indirect contact in the dissemination of CAEV should be taken into account in control and eradication programs.

Key Words: Caprine Arthritis Encepahlitis Virus, Goats, Colostrum

T33 Identification of Cydectin targets in *C. elegans*. M. Worku*, O. Alexander, and P. Matterson, *North Carolina Agricultural and Technical State University*, *Greensboro*.

Model systems such as the free living nematode *Caenorhabditis elegans* (*C. elegans*) are being used to identify drug targets. With the availability of the genome sequence it can be used to study the function and expression of drug target genes on a global scale. Macrocyclic lactones are chemical compounds that represent the main treatment for parasitic diseases of animals. The objective of this study was to evaluate the effect of cydectin on global gene expression in *C. elegans* to identify drug targets that may contribute to the development of anit-helminthic resistance. Nematodes were grown and exposed to 7 ml of a sub-lethal dose of Cydectin (Quest®Gel), (0.016 mg/ml in sterile water) and washed in PBS. Controls were exposed to PBS. RNA was isolated using RNeasy (Qiagen) kits. RNA integrity and size distribution was checked on a bioanalyzer. Total *C. elegans* array chips (Washington State University) were used for expression profiling. A dye swap system was used (N= 6 slides). Data acquired using Jaguar analysis software was analyzed using Magic tool. Differential gene expression was observed. Twenty up or down regulated genes/array slide (200 total) were selected. Four fold differences were used to select genes common to five slides used. Exposure to Cydectin resulted in increased transcription, (3.06 ug in controls, 4.89 ug treated). In addition to genes with unknown function we have identified two genes that may be the site of action of cydectin, PtP3 and unc-11. Unc-11 is a highly conserved gene that functions to regulate the neuronal network that controls the pharynx. PtP3 is a phosphatase which may be important in post transcriptional modification. Further studies are needed to define the pathways of action. Characterization of these genes may contribute to the understanding of the molecular basis for drug resistance and genetic diversity of nematodes.

Key Words: *C. elegans*, Nematode, Drug Target

T34 Composition of amino acids in typical Chinese herbs is not unique among feeds of plant origin. X. Wu*[1], X. F. Kong[1], Y. L. Yin[1], F. G. Yin[1], P. Zhang[1], H. J. Liu[1], F. F. Xing[1], Q. H. He[1], T. J. Li[1], R. L. Huang[1], and G. Y. Wu[1,2], [1]*Institute of Subtropical Agriculture, The Chinese Academy of Sciences*, *Changsha, Hunan, China*, [2]*Texas A&M University*, *College Station*.

As an initial step to define the mechanisms responsible for the beneficial effects of typical Chinese herbs on health and growth performance of swine and poultry, we determined concentrations of CP and amino acids in *Astragalus membranaceus, Acanthopanax senticosus, Salvia miltiorrhiza bunge, Crataegus pinnatifida Bge, and Salvia miltiorrhiza Bge*. Ten representative samples for each herb were hydrolyzed in 6 N HCl under nitrogen at 110°C for 24 h and the resultant amino acids were determined using an automatic amino acid analyzer. Results are expressed on the DM basis. Concentrations of CP in these five Chinese herbals were 14.1%, 13.9%, 3.06%, 2.06%, and 6.28%, respectively. Concentrations of total amino acids in *Astragalus membranaceus, Acanthopanax senticosus, Salvia miltiorrhiza bunge, Crataegus pinnatifida Bge, and Salvia miltiorrhiza Bge* were 10.6%, 2.84%, 3.43%, 3.99%, and 7.02%, respectively. Concentrations of Arg, Lys, Glu+Gln, branched-chain amino acids, and Asp+Asn in *Astragalus membranaceus* were 0.64%, 1.08%, 1.37%, 1.49%, and 1.64%, respectively. Concentrations of Arg, Lys, Glu+Gln, branched-chain amino acids, and Asp+Asn in *Salvia miltiorrhiza Bge* were 0.77%, 0.36%, 1.05%, 1.10%, and 0.64%, respectively. The composition of amino acids in the Chinese herbs is largely similar to that in feeds of plant origin. These results indicate that typical Chinese herbs are not unique in the composition of protein-precursor amino acids among plants. Other components in the herbs are likely major active components that beneficially regulate intestinal barrier integrity, nutrient metabolism, immune function, health, and growth in animals. (Supported by NSFC and CAS)

Key Words: Chinese Herbs, Amino Acids, Nutritive Value

Beef Species

T35 Effects of season and bull breed of semen on pregnancy rate in beef cattle. K. Kreausukon[1], S. Teepatimakorn[2], P. Vinitchaikul*[1], P. Yamsakul[1], and W. Suriyasathaporn[1], [1]*Chiang Mai University*, *Muang, Chiang Mai, Thailand*, [2]*Chiangmai Artificial Insemination Research and Biotechnology Center*, *Muang, Chiang Mai, Thailand*.

The objectives of this study were to identify the factors associated with conception risk in beef cattle. Data of artificial insemination of beef cows during September 2003 to October 2004 recorded by AI center were used. The data included bull breed of semen, date of artificial insemination, and results of pregnancy check. Season included winter (Nov-Feb), summer (Mar-May), and rainy (Jun-Oct). Bull breed of semen included Charolais (CHA) and American Brahman (AB). The generalized estimating equation (GEE) was used to analyze the effect of season and bull breed of semen on pregnancy rate. The final data included 2,823 observations. Overall pregnancy rate was 79.14%. The pregnancy rates for winter, summer, and rainy seasons were 82.5, 83.2, and 74.4%, respectively, and the rates for CHA and AB were 78.5 and 83.1%, respectively. Results from GEE showed that both factors were associated with pregnancy rate ($P<0.05$). In comparison to rainy season, beef cattle inseminated during winter and summer seasons had higher conception risks (OR = 1.63 and 1.71, respectively). Beef cattle inseminated with semen from American Brahman bull had lower pregnancy risk than the semen from Charolais bull (OR=0.74). In Thailand, the high temperature with high humidity might cause more heat stress in cattle. In conclusion, pregnancy risks in beef cattle are associated with season and bull breed of semen.

Key Words: Season, Beef, Conception