**P437** The effect of diet type on *Clostridium perfringens* in broiler chickens using the Fung Double Tube. M. Barrios,* J. Saini, K. McKay, R. S. Beyer, and D. Y. C. Fung, Kansas State University, Manhattan.

Necrotic enteritis (NE) costs the poultry industry USD 2 billion a year worldwide. Subclinical NE costs as much as $0.05 per bird. *Clostridium perfringens*, the causal microorganism of NE, attaches to epithelial lesions most often caused by coccidiosis, resulting in NE. The objective of this study was to determine the effect of diet type on the population of *C. perfringens* in broiler intestines using the Fung Double Tube (FDT). There were 3 diets in Trial 1, and 4 diets in Trial 2, and 3 replications per diet. Twenty newly hatched chicks were placed per floor pen, for a total of 180 and 240 chicks for Trial 1 and 2, respectively. Diets in Trial 1 included: corn-soybean meal (SBM), low-crude protein (19.8%)/high synthetic amino acids (SAA), and barley (56%)-fishmeal (4%) (BF). Diets in Trial 2 consisted of: corn-SBM, barley (7.46%), fishmeal (4%), and BF (7.46%, 4%). Diets in Trial 1 contained an antibiotic and a coccidiostat; diets in Trial 2 did not. After 21 d, 3 birds per pen were randomly selected and the jejunum and ileum were harvested. In Trial 1, birds fed BF had significantly higher (P < 0.05) counts (5.96 log cfu/g) of *C. perfringens*, as compared with all other diets. Both, corn-SBM and SAA diets resulted in 3.89 log cfu/g. In Trial 2, birds fed the corn-SBM diet (2.7 log cfu/g) had significantly lower (P < 0.05) counts than broilers fed BF (4.15 log cfu/g). When broilers were fed fishmeal (3.583 log cfu/g) and barley (3.577 log cfu/g) separately, *C. perfringens* counts were numerically higher compared with the corn-SBM diet, but numerically lower than birds fed BF. Broilers fed corn-SBM resulted in the lowest counts of *C. perfringens*. Barley and fishmeal inclusion increased the incidence of *C. perfringens*, and their combination resulted in the highest exacerbation of *C. perfringens*. The FDT proved to be an effective method to detect the differences in *C. perfringens* counts from intestines of chickens fed different diets.

**Key Words:** fung double tube, *Clostridium perfringens*, barley, fishmeal, broiler


“White Striping” (WS) is the abnormal white striation seen parallel to the direction of muscle fibers in broiler breast fillets and thighs with variable frequency at processing. Broiler breast fillets can be categorized as normal (NORM), moderate (MOD) and severe (SEV) based on the degree of WS. Histologically, the SEV fillets are characterized by chronic degeneration of muscle fibers along with fibrosis and lipidosis when compared with NORM. The present study was undertaken to compare the hematologic and serologic profiles of broilers with NORM and SEV degrees of WS. In this study, day-old male broiler chicks of a commercial strain were grown on the same diet in 6 replicate pens (n = 32 birds/pen). Blood samples (5mL) were collected from the wing vein of each bird on the day before processing (62d) for analyzing hematologic and serologic profiles. At 63d, the birds were weighed and processed in a commercial-style inline processing system. Weight of the butterfly fillets, liver and abdominal fat pad were recorded. Left-side fillets were scored to obtain the degree of WS for each bird. Hematologic and serologic profiles of blood from birds that exhibited either NORM (n = 24) or SEV (n = 17) breast fillets were compared. The SEV birds had a higher (P < 0.05) live, fillet and liver weights as well as fillet yield when compared with the NORM birds, but the abdominal fat yield was lower (P < 0.05) in SEV birds. No differences (P > 0.05) were observed in differential leucocyte counts between groups. The SEV birds had elevated (P < 0.05) levels of creatine kinase, alanine transaminase, aspartate aminotransferase and lactate dehydrogenase. These results suggest that there is no systemic infectious or inflammatory condition associated with SEV degree of WS, and the elevated serum enzyme levels in the SEV birds confirm the muscle damage.

**Key Words:** White Striping, broiler, hematologic and serologic, muscle damage, serum enzyme

**P439** A comparative study of live attenuated F strain-derived *Mycoplasma gallisepticum* vaccines applied via spray. J. D. Evans,*1 R. Jacob2, S. A. Leigh1, S. D. Collier1, E. D. Peebles2, and S. L. Branton1, 1USDA-ARS Poultry Research Unit, Mississippi State, 2Mississippi State University, Starkville.

Commercially available live attenuated strains (LAVs) of *Mycoplasma gallisepticum* (MG) are commonly used within the layer industry to control MG-induced mycoplasmosis. Among these are 2 F strain-derived LAVs. To compare the efficacy of these vaccines following spray application, Hy-Line W-36 layers (n = 120) were divided equally among 12 biological isolation units and maintained through 18 wks of age. At 9 wk of age, subjects in each biological isolation unit were spray vaccinated with one of the F strain-derived LAVs, at one of 5 levels (10X, 1X, 10^-3X, 10^-4X, or 0X). Titters associated with the 1X dosage were 7.1 × 10^6 cfu/dose and 2.5 × 10^6 cfu/dose. At 6 wks post-vaccination (p.v.), serum was collected from each bird and seroconversion was assessed via serum plate agglutination (SPA). In addition, 5 birds per treatment were necropsied and assessed for vaccine-associated airsacculitis. At 7 wk p.v., birds were intratracheally infected with a virulent MG challenge strain (Rlow) and 7 d post-challenge, 5 birds per treatment were necropsied and assessed for MG-associated airsacculitis. SPA analyses of 10X treatments at 6 wk p.v. indicated seroconversion rates of 80% and 100% for the 2 vaccines, while 1X treatments only yielded 10% and 40% seroconversion rates. No airsacculitis due to LAV treatment was observed 6 wk p.v. Following virulent MG challenge, airsacculitis was observed in 80% of 0X-treated subjects. Protection (as indicated by the reduction in the occurrence of airsacculitis) was only observed among the 10X treatments. Within these treatments, airsacculitis was observed in 0% and 20% of subjects following virulent MG challenge. Based on these findings, both of the commercially available F strain-derived LAVs when applied via spray resulted in seroconversion and protected vaccinated hosts from virulent MG when applied at appropriate dosages.

**Key Words:** *Mycoplasma gallisepticum*, vaccine, mycoplasmosis, egg layers
**P440**  Dexamethasone triggers lameness associated with necrosis of the proximal tibial head and proximal femoral head in broilers. R. F. Wideman*,1 and I. Pevzner2,1University of Arkansas, Division of Agriculture, Fayetteville; 2Cobb-Vantress, Inc., Siloam Springs, AR.

Bacterial chondronecrosis with osteomyelitis (BCO) is the most common cause of lameness in commercial broilers. Both BCO and turkey osteomyelitis complex (TOC) are characterized by microbial infection and necrotic degeneration within the tibiae and femora. TOC can be triggered experimentally by injecting poults with repeated immunosuppressive doses of dexamethasone (Dex), a synthetic glucocorticoid (Huff et al., 1998, 1999, 2000). Environmental stressors and immunosuppression contribute to the eruption of opportunistic pathogens harbored subclinically in the tibial joints of turkeys that develop TOC. Based on the etiological similarities between BCO and TOC, the present study was conducted to determine if Dex injections can trigger BCO and lameness in broilers reared on wood shavings litter in environmental chambers. In 2 experiments broilers were weighed and received 3 (Experiment 1; d 29, 31, 33; 1.5 mg/kg BW) or 6 (Experiment 2; d 36, 38, 40, 43, 45, 47; 1.0 mg/kg BW) i.m. injections (thigh muscle) of Dex (Dex #1 and #2, respectively; n = 25 per experiment) or saline (Saline #1 and #2, respectively; n = 25 per experiment). Dexamethasone triggered high incidences of lameness in both experiments (24% and 42% for the Dex #1 and #2 groups, respectively) whereas negligible lameness developed in the Saline groups (4% and 0% for the Saline #1 and #2 groups, respectively; P = 0.001 for Dex #2 vs. Saline #2). Growth ceased almost immediately after the initial Dex injection regardless whether the birds became lame or survived. Dex injections also triggered lameness attributable to lesions that are not considered pathognomonic for BCO (e.g., avascular femoral head necrosis and fatty necrosis of the tibial metaphysis). Accordingly, lameness triggered by repeated Dex injections does not appear to precisely mimic the pathogenesis of BCO in broilers.

**Key Words:** lameness, immunosuppression, glucocorticoids, broilers

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**P441**  Efficacy of HyD (25-OH Vitamin D3) prophylactic administration for reducing the incidence of lameness in broilers grown on wire flooring. R. F. Wideman*,1 K. N. Mitchell1, J. Blankenship1, I. Pevzner*,1 and B. J. Turner1,1University of Arkansas Division of Agriculture, Fayetteville; 2Cobb-Vantress, Inc., Siloam Springs, AR; 3DSM Nutritional Products LLC, Parsippany, NJ.

Bacterial chondronecrosis with osteomyelitis (BCO) is the most common cause of lameness in commercial broilers. Growing broilers on wire flooring provides an excellent experimental model for reproducibly triggering significant levels of lameness attributable to BCO. In the present study we evaluated the efficacy of adding HyD (25-OH vitamin D3) to the drinking water as a preventative/prophylactic treatment for Bacterial chondronecrosis with osteomyelitis (BCO) of the proximal femurs; chambers pooled). The most prevalent diagnoses for lame birds were osteochondrosis and osteomyelitis (BCO) of the proximal femora (52%) and tibiae (79%), accompanied by minor incidences of tibial dyschondroplasia (0.6%), spondylololisthesis (1.2%), and twisted legs (1.7%). Broilers that survived to d 56 without developing lameness did not differ in BW when compared by group within a gender. The wire flooring model imposes a rigorous, sustained challenge that undoubtedly is much more severe than typically would be experienced by broilers under normal commercial conditions. Therefore the encouraging response to HyD supplementation in the present study supports the potential for 25-OH vitamin D3 to attenuate outbreaks of lameness caused by BCO in commercial broiler flocks.

**Key Words:** lameness, vitamin D3, broilers, osteomyelitis

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**P442**  Changes of biochemical parameters and proteomics in livers of broiler chickens with cold-induced ascites. W. Yongwei,*1 G. Yuming, L. Dan, Y. Ying, and N. Dong, State Key Lab of Animal Nutrition, College of Animal Science and Technology, China Agricultural University, Beijing, China.

The aim of this study was to identify proteins involved in hepatic gluconeogenesis in cold-induced ascitic and healthy broilers by 2-DE and MS. Changes of blood parameters, biochemical parameters in liver and serum were also determined. 510 one d old male broilers (Ross-308) were randomly assigned to 14 pens. Birds were raised under normal temperature until d10. Then birds were exposed to cold temperature to induce ascites (17 °C at daytime and 14 °C at night) until wk 6. On d39, 8 ascitic and healthy birds were selected and slaughtered. Anti-coagulant blood, serum and liver tissues were obtained for biochemical parameters, enzyme activities and proteomics analysis. Data were analyzed by t-test of SPSS 17.0 (P ≤ 0.05). Throughout this study, RBC and HCT of ascitic chickens were greater than healthy ones (3.52 × 1012 vs 2.63 × 1012/L, P < 0.01; 0.44 vs 0.33, P < 0.01). Hepatic MDA level of ascitic chickens was greater (0.31 vs 0.27 mmol/mg prot, P < 0.05), but T-SOD activity was lower than healthy ones (3.74 vs 4.63 U mg prot, P < 0.01). Hepatic pyruvic acid and lactic acid level of ascitic chickens were lower than healthy ones (0.02 vs 0.04 mmol/g prot, P < 0.05; 0.16 vs 0.20 mmol/mg prot, P < 0.05). Serum glucose, cholesterol level of ascitic chickens were greater than healthy ones (17.42 vs 13.94 mmol/L, P < 0.01; 10.34 vs 7.37 mmol/L, P < 0.01), but there was no significant difference for triglyceride level (P > 0.05). The results of proteomics indicated that 18 proteins were identified between ascitic and healthy chickens, and phosphoenolpyruvate carboxykinase (PEPC) was mainly involved in gluconeogenesis. This study found that the expression of hepatic PEPC chain A in ascitic chickens was higher than healthy ones. In conclusion, liver oxidative damage was significantly aggravated, but antioxidant capacity was decreased in cold-induced ascitic chickens. Serum glucose level was significantly increased, and hepatic PEPC expression in ascitic chickens was higher, which suggested that ascites susceptibility could be reduced by regulating genes/proteins expression related to gluconeogenesis/energy metabolism.

**Key Words:** ascites, biochemical parameters, proteomics analysis, broiler chickens

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**P443**  Effects of mycotoxin contaminated diets on histopathology and antibody titer following viral vaccination in young replacement layer pullets. S. Iselt*,1 J. Lee2, M. Farnell2, M. Ficken2, U. Hofstetter3, R. Beltran2, G. Schatzmayer3, and D. Caldwell1,1Poultry Science Department, Texas A&M University, College Station; 2Texas State Key Lab of Animal Nutrition, College of Animal Science and Technology, China Agricultural University, Beijing, China; 3DSM Nutritional Products LLC, Parsippany, NJ.

The present study was conducted to determine if mycotoxins in diets can trigger BCO and lameness in broilers reared on wood shavings litter in environmental chambers. In 2 experiments broilers were weighed and received 3 (Experiment 1; d 29, 31, 33; 1.5 mg/kg BW) or 6 (Experiment 2; d 36, 38, 40, 43, 45, 47; 1.0 mg/kg BW) i.m. injections (thigh muscle) of Dex (Dex #1 and #2, respectively; n = 25 per experiment) or saline (Saline #1 and #2, respectively; n = 25 per experiment). Dexamethasone triggered high incidences of lameness in both experiments (24% and 42% for the Dex #1 and #2 groups, respectively) whereas negligible lameness developed in the Saline groups (4% and 0% for the Saline #1 and #2 groups, respectively; P = 0.001 for Dex #2 vs. Saline #2). Growth ceased almost immediately after the initial Dex injection regardless whether the birds became lame or survived. Dex injections also triggered lameness attributable to lesions that are not considered pathognomonic for BCO (e.g., avascular femoral head necrosis and fatty necrosis of the tibial metaphysis). Accordingly, lameness triggered by repeated Dex injections does not appear to precisely mimic the pathogenesis of BCO in broilers.

**Key Words:** lameness, immunosuppression, glucocorticoids, broilers
Compared with broilers, fewer studies in recent years have focused upon the negative impact of mycotoxin consumption in replacement layer stock. The objective of the current trial was to evaluate histopathology and antibody titer following viral vaccination in young (0–65 d of age) layer pullets fed diets contaminated with deoxynivalenol (DON) and aflatoxin B1 (AFB1), with or without the inclusion of a mycotoxin deactivating compound (DC; Mycofix Select). The vaccination schedule of a local commercial table egg producer was followed to vaccinate pullets against Newcastle disease virus (NDV), infectious bronchitis virus (IBV), and infectious bursal disease virus (IBDV). Toxin levels in diets were separated into low (1.0 ppm DON + 1.0 ppm AFB1) or high (2.0 ppm DON + 2.0 ppm AFB1) treatment groups. Chicks in low or high toxin groups received contaminated diets continuously from placement through termination. Histopathological assessment at 35 and 65 d of age showed increased ($P < 0.05$) liver pathology in high, but not low ($P > 0.05$) toxin groups. While histopathology score in livers in high toxin + DC chickens appeared to be lower than high toxin alone livers, they were not different ($P > 0.05$) following statistical analysis. Histopathology scores in kidney, spleen, thymus, and bursa were not affected by treatment or DC inclusion. Effects of dietary DON or AFB1 at low or high levels, with or without DC, did not consistently affect antibody titer to NDV, IBV, or IBDV vaccination. Expected negative effects of toxin administration on titer development were not observed. The results of this study suggest that chronic consumption of mycotoxin-contaminated diets by young replacement layer pullets may negatively impact histopathology of liver tissue.

**Key Words:** mycotoxin, layers, antibody titer, histopathology, vaccination