

**298P Interrelationships of fungal and bacteria populations within the gastrointestinal tract environment of poultry.** J. A. Byrd\*, USDA, ARS, Food and Feed Safety Research Unit, College Station, TX.

Effective *Salmonella* control in broilers is important from the standpoint of both consumer protection and industry viability. We investigated associations between *Salmonella* recovery from different sample types collected at sequential stages of grow-out from the broiler gastrointestinal tract and production environment. The goal of the present study was to record changes in fungi populations recovered from poultry gastrointestinal tracts and relate those changes to foodborne pathogen status. Over 3,000 broiler gastrointestinal samples were isolated and over 680 samples were further characterized using an automated repetitive sequence based PCR (rep-PCR) methodology to track fungal genera changes during successive grow-outs. Over 24 different fungal and yeast genera were identified using rep-PCR including *Rhizopus* spp., *Aspergillus* spp., *Penicillium* spp., and *Fusarium* spp. The results from the present study will provide a normal fungi genera under commercial conditions, relate these fungi to foodborne pathogens, and will be a stepping stone for investigating the effect of fungi on the gastrointestinal tract and overall health of poultry.

**Key Words:** fungi, *Salmonella*, poultry, gastrointestinal tract

**299P Effect of initial day-old chick weight on the first week development.** V. S. de Avila\*<sup>1</sup>, E. L. Krabbe<sup>1</sup>, D. Surek<sup>1</sup>, J. H. de A. Ruiz<sup>2</sup>, and B. Wernick<sup>2</sup>, <sup>1</sup>Embrapa Swine and Poultry, Concordia, SC, Brazil, <sup>2</sup>BASF SA, São Paulo, SP, Brazil.

An experiment was conducted to evaluate the effect of the grouping of 1-d-old chicks according to initial weight on the subsequent 7-d performance. A group of 4,200 chicks were selected from a total of 4,257 chicks with  $43.1 \pm 3.8$  g, kurtosis  $-0.31$  and skewness  $0.24$ , the heaviest chicks weighed  $52$  g and the lightest  $37$  g. These chicks were grouped according to their initial weight in 10 treatments with 12 replicates per treatment and 35 birds per experimental unit. All birds were housed in floor pens with wood shavings as litter. The treatments initial average weight were:  $37.91$ ,  $39.3$ ,  $40.6$ ,  $41.3$ ,  $42.1$ ,  $42.8$ ,  $43.8$ ,  $44.7$ ,  $45.9$ ,  $48.1$  g. Data were submitted to statistical analysis (ANOVA), GLM (SAS, 2008); the means were compared with Student *t*-test, 5% and the correlations between initial weight and performance at 7 d were determined by the Pearson method. There was no effect of initial weight on feed intake at the first week. The treatments that had the greatest weight gain ( $118$  g) were with initial weight  $43.8$  and  $44.7$  g, the largest difference was between these groups and treatment with  $48.1$  and  $42.1$  g ( $111$  g), and the lightest treatment with  $37.91$  g had  $113$  g of weight gain. For feed conversion rate the treatment with  $48.1$  and  $42.1$  g had the worst value  $1.11$  and most difference between treatments was  $0.046$ . Furthermore, there was no correlation between initial weight and weight gain ( $P = 0.57$ ), but feed intake and feed conversion rate were weak and positively correlated with initial weight ( $R = 0.21$  and  $R = 0.24$ , respectively, both at  $P < 0.05$ ). The correlation was moderated and positive between initial weight and 7 d weight ( $R = 0.54$ ,  $P < 0.01$ ). Growth rate (7 d weight/initial weight) and initial weight were strongly and negatively correlated ( $R = -0.84$ ,  $P < 0.01$ ). It was concluded that the light birds had higher growth rate from one up to 7 d.

**Key Words:** broiler, development, growth, management weight, poultry

**300P Influence of complexed mineral supplementation on intestinal *Escherichia coli* and *Salmonella*.** K. S. Macklin\*<sup>1</sup>, J. B. Hess<sup>1</sup>, S. F. Bilgili<sup>1</sup>, J. T. Krehling<sup>1</sup>, and T. Cheng<sup>2</sup>, <sup>1</sup>Auburn University, Auburn, AL, <sup>2</sup>Zinpro Corp., Eden Prairie, MN.

The objective of this trial was to examine the effect of complexed zinc and manganese on *Escherichia coli* and *Salmonella* Enteritidis (SE) challenged broilers. Day-old broiler males (640) were selected and raised for 30 d on 1 of 4 dietary treatments in floor pens. The treatments were: control (CON; 80 ppm Zn, 90 ppm Mn), Availa Zn Iso (AZI; Zn sulfate 40 + Availa-Zn 40; Mn sulfate 90 ppm), Availa-Zn on Top (AZOT; Zn Sulfate 80 + Availa-Zn 40; Mn Sulfate 90 ppm) and Availa-Zn and Mn (AZM; Zn sulfate 40 + Availa-Zn 40; Mn sulfate 50 + Availa-Mn 40). On d 30, 2 birds per replicate (16/trt) were randomly selected and challenged with a bacterial cocktail containing  $10 \times 7$  of SE and an APEC strain of *E. coli*. After challenge the birds were reared to d 34 in Petersime batteries at which time they were necropsied. During the necropsy each bird had approximately 60 cm of the intestine removed, rinsed with PBS and this rinsate was reserved. The excised intestine was scraped and the resulting mucosal slurry collected. Livers were harvested, diluted and stomached. For each bird, BW, spleen weight and bursa size were determined. The liver and intestinal samples were then plated onto XLT4 and MacConkey for enumeration of SE and *E. coli* respectively. The remaining samples were divided in half and enriched with TTB for SE and TB for *E. coli*. Bacterial counts and enriched data was appropriately transformed. All data was then analyzed with GLM ( $P < 0.05$ ) and the means separated using Tukey's test. Results from this study showed that birds fed AZOT had lower *E. coli* levels in the intestinal rinsate and scrapings than other treatments although these differences were not significant. Liver *E. coli* levels were lower for all 3 treatments fed complexed trace minerals. Liver SE levels were lower ( $P = 0.07$ ) for birds fed either AZOT or AZM compared with the other 2 treatments. Bursal scores were improved and spleen/BW ratios were decreased, indicating improved immunity and reduced internalized bacterial challenge. These results indicate that supplementing poultry diets with complexed Zn or complexed Zn and Mn can decrease intestinal colonization and septicemia caused by *Salmonella* and APEC.

**Key Words:** complexed minerals, broiler, *Salmonella*, *E. coli*

**301P The impact of deposition site on vaccination efficiency of a bacterial-based live poultry vaccine applied via spray.** J. D. Evans\*, J. L. Purswell, S. A. Branton, S. D. Collier, S. A. Leigh, and E. J. Kim, USDA-ARS Poultry Research Unit, Mississippi State, MS.

Vaccines are used in the poultry industry to limit disease-associated losses and spray vaccination is a commonly utilized means to mass apply poultry vaccines. During this process, the liquid particles derived from a vaccine suspension vector the vaccine to the potential host and vaccination occurs following internalization of the vaccine. Although a portion of the vaccine may be directly internalized during the spray process, a larger portion of the vaccine-containing particles are deposited on the potential host and its environment. To better determine the fate of these particles and the effect of deposition site on the efficiency of a vaccination utilizing a live bacterial-based poultry vaccine (AviPro MG F), a spray cabinet was constructed with a slotted partition allowing for head-only, body-only, and head/body (concurrent) spray vaccination. Naïve Hy-Line W-36 pullets were obtained at 1 d of age. At 11 wk of age, pullets ( $n = 280$ ) were allocated equally among 7 treatments, including non-vaccinated controls; pullets spray-vaccinated at the manufacturer's recommended dose ( $1 \times$ ) in a site-specific manner (head-only, body-only, and head/body); pullets spray-vaccinated at