

# Poultry Science

## Annual Meeting Abstract



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*Southern Poultry Science Society*  
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**253** Influence of  $\text{NH}_4\text{Cl}$ ,  $\text{KCl}$ , and  $\text{NH}_4\text{Cl} + \text{KCl}$  on Blood Electrolytes and Mortality of Chicks Under Acute Heat Stress. J. Arshami<sup>\*1</sup> and A. Hessabi Nameghi<sup>1</sup>, <sup>1</sup>Ferdowsi Univ. Mashhad, Faculty of Agriculture, Dept. Animal Sci., Mashhad, Iran.

Sudden heat induction of summer time in N.E. of Iran as a cause of mortality was evaluated in a randomized design experiment (2x4 factorial) using Lohman chicks (14/pen, 20 pens/sex). Chicks were received 4 treatments (I:0.6%  $\text{NH}_4\text{Cl}$ ; II:0.6%  $\text{KCl}$ ; III:I + II; and IV: Control) on day 33<sup>rd</sup> in drinking water and the Acute Heat Stress (AHS) on day 34<sup>th</sup> at 40°C for 5 hrs. Blood samples were collected at the beginning, during (2:30 hrs.) and at the end of AHS in order to determine the levels of  $\text{K}^+$ ,  $\text{Cl}^-$ ,  $\text{Ca}^{++}$ ,  $\text{Na}^+$ , pH, and % mortality. The AHS increased  $\text{K}^+$  during, but decreased at the end. The treatments increased  $\text{K}^+$  before, during and at the end of AHS with the highest for treatments I and III respectively ( $P \leq 0.05$ ). The effect of AHS on  $\text{K}^+$  did not show differences

between male (M) and female (F) chicks. AHS increased  $\text{Cl}^-$  during and at the end of period. The treatments increased level of  $\text{Cl}^-$  before and during AHS but decreased at the end with highest for I and II respectively ( $P \leq 0.05$ ). The level of  $\text{Cl}^-$  decreased in M and F with no differences at the end. AHS was decreased  $\text{Ca}^{++}$  during and at the end. The treatments increased  $\text{Ca}^{++}$  at the beginning then gradually decreased by the end with lowest for  $\text{NH}_4\text{Cl}$  ( $P \leq 0.05$ ). The M group showed higher  $\text{Ca}^{++}$  than F ( $P \leq 0.05$ ). The level of  $\text{Na}^+$  decreased under AHS. Treatments I and III showed lowest and highest  $\text{Na}^+$  at the end ( $P \leq 0.05$ ). The M chicks had higher  $\text{Na}^+$  than F ( $P \leq 0.05$ ). The pH increased in all treatments at the end of AHS ( $P \leq 0.05$ ). Treatments I and III showed lowest pH before and during AHS ( $P \leq 0.05$ ). The F chicks showed lower pH than M under AHS ( $P \leq 0.05$ ). The % mortality was highest for control group and lowest for treatments ( $P \leq 0.05$ ).  $\text{NH}_4\text{Cl}$  would acts better on chicks under AHS.

**Key Words:** Acute Heat Stress,  $\text{NH}_4\text{Cl}$ ,  $\text{KCl}$ , Electrolytes, Mortality

## Tuesday, AM, John Q. Hammons Hall I, ENVIRONMENT AND MANAGEMENT

**254** Effect of vitamin and trace mineral withdrawal on performance of broilers reared under high density stress. K. V. Vo<sup>\*</sup>, N. A. Adefope, C. L. Fenderson, and S. H. Kolison, Tennessee State University, Nashville, TN 37209.

Five hundred and four 42-day-old commercial broilers were used in a 2x3 factorial design to evaluate the effect of withdrawal of vitamins (V) and trace minerals (TM) during the last 7 days of the growing period on growth performance, processing yield, and stress response. Three floor space allowances used were 855 (D1), 615 (D2), and 475 sq cm per bird (D3). Half of the birds were fed a control finishing ration while the other half were fed a finishing ration with no supplemental vitamins and trace minerals. Feed and water were given *ad libitum*. All birds received a continuous lighting program. Results from this study indicated that rearing density had a significant ( $P \leq .05$ ) effect on weight gain. The average 7-day weight gains were 586.6, 545.2 and 444.3 g for D1, D2 and D3 groups, respectively. Feed conversions were poorer with increasing rearing densities. Crowding condition produced a hemo-stress response in birds as indicated by an increase in the percent of heterophils and a decrease in the percent of lymphocytes. Withdrawal of V and TM from the diet of birds in the group D3 significantly ( $P \leq .05$ ) reduced weight gain and increased feed:gain ratio. No significant differences in these parameters were observed in groups D1 and D2 due to withdrawal. Hematocrit, differential white blood cell count, dressing percentage, fat and part yields were not significantly affected by withdrawal of V and TM for 7 days. Based on these results, it is not feasible to withdraw V and TM during the last 7 days of the growing period when birds were reared under crowding conditions.

**Key Words:** Broiler, Rearing density, Vitamin and trace mineral withdrawal, Stress, Processing yield

**255** Performance and nutrient retention in broilers fed a *Lactobacillus*-based pro-biotic. C. R. Angel<sup>\*1</sup>, P. Melvin<sup>2</sup>, R. A. Dalloul<sup>1</sup>, N. M. Tamim<sup>1</sup>, T. A. Shellem<sup>1</sup>, and J. A. Doerr<sup>1</sup>, <sup>1</sup>Univ. of Maryland, College Park, <sup>2</sup>Perdue Farms, Inc., Salisbury, MD.

Four hundred male broilers (Ross 308) were reared on floor pens and provided starter diet with or without pro-biotic (Primalac, .2 lb/ton). At 18 d, birds were weighed and, within pro-biotic treatment, randomly assigned to battery pens (8/pen, 10 pens/trt). A 2x2 factorial arrangement of nutrient density [control (C) (19.3% protein (CP), .84% Ca, .37% nonphytate P (nPP); 17.1% CP, .8% Ca, .3% nPP in the grower and finisher diet, respectively) and low nutrient (LN) (17% CP, .69% Ca, .30% nPP; 15% CP, .66% Ca, .25% nPP in the grower and finisher diet, respectively)] and pro-biotic [0 or 2 (+) lb/ton] was used. Body weight and feed efficiency were determined and excreta collected at the end of the grower (18-28 d) and finisher (28-42 d) phases. At the end of each phase, 3 birds/pen were sampled. At 28 d, birds were randomized within treatment into 6 pens /trt (4 birds/pen). At both 28 and 42 d birds fed LN weighed less ( $P < .05$ ) than those fed C, and C+ fed birds gained more ( $P < .05$ ) than either C or LN. At 42 d LN+ fed birds were heavier ( $P < .05$ ) than those fed C. There was a nutrient level and pro-biotic main effect, but no interaction, on protein, Ca, and P retention at 28 d and 42 d of age. Ca and P retention at 28 d was higher ( $P < .05$ ) in LN+ fed birds (50.9 and 43.6%, respectively) and lowest in C fed birds

(35 and 33.5%, respectively). Moisture content was lowest ( $P < .05$ ) in birds fed the pro-biotic added diets. A main effect, but no interaction, of nutrient level and pro-biotic was seen on amount of nitrogen and P in the excreta with the lowest ( $P < .05$ ) levels seen in excreta from birds fed the LN+ diet. These effects were consistent between phases. These data show that the addition of the pro-biotic improved nutrient (protein, Ca, P) retention and allowed the birds fed the LN+ to overcome the effect of low nutrient (12% less protein and 18% less Ca and nPP) density on performance. This has implications on the economics of production and on current environmental concerns.

**Key Words:** Pro-biotic, Performance, Retention, Protein, Minerals

**256** Broiler performance and carcass quality at different stocking densities. J. J. R. Feddes<sup>1</sup>, E. J. Emmanuel<sup>\*1</sup>, R. H. McGovern<sup>2</sup>, and M. J. Zuidhof<sup>2</sup>, <sup>1</sup>University of Alberta, Edmonton, AB, Canada, <sup>2</sup>Alberta Agriculture, Food and Rural Development, Edmonton, AB, Canada.

The effects of four stocking densities and nipple drinker densities on broiler performance and carcass traits were measured. The stocking densities of 0.45, 0.60, 0.75 and 0.90  $\text{ft}^2/\text{bird}$  corresponded to 260, 195, 156 and 130 birds per pen, respectively. The nipple drinker densities were 5, 10, 15 and 20 birds/nipple. Two trials were conducted with the birds in trial 1 shipped at day 39 and those in trial 2 shipped at day 42. Water and feed were provided *ad libitum* and light was provided 23h/day. Nipple density had no effect on broiler performance and carcass quality. The effect of stocking density showed that the 0.45  $\text{ft}^2/\text{bird}$  treatment had a significantly lower BW (1898 g) and carcass weight (1334 g), while the 0.75  $\text{ft}^2/\text{bird}$  treatment had the highest BW (1985 g) along with carcass weight (1432). Although the 0.45  $\text{ft}^2/\text{bird}$  treatment had the lowest BW, the yield of broilers per unit of floor space was highest in this treatment (46.0  $\text{kg}/\text{m}^2$ ). The coefficient of variation (flock uniformity) was significantly higher in the 0.90  $\text{ft}^2/\text{bird}$  treatment (15.3 %) while the other treatments were the same (13 %). The birds in the 0.90  $\text{ft}^2/\text{bird}$  treatment consumed the least amount of feed (2993 g/bird) and those in the 0.75  $\text{ft}^2/\text{bird}$  treatment consumed the highest amount of feed (3183 g/bird). The amount of water consumed and the water to feed ratio was highest in the 0.45  $\text{ft}^2/\text{bird}$  treatment (5546 ml/bird) which also had a significantly higher water to feed ratio (1.85 ml/g). Stocking density had no significant effects on mortality, breast yield, carcass grading, scratches or carcass quality.

**Key Words:** Broiler, Stocking density, Body weight, Feed consumption *Salmonella typhimurium*

**257** Gene amplification approach for detection of *Salmonella typhimurium* in poultry aerosol samples. D. R. Jackson<sup>\*1</sup>, D. E. Corrier<sup>2</sup>, S. D. Pillai<sup>3</sup>, C. L. Woodward<sup>1</sup>, J. Peña<sup>3</sup>, and S. C. Ricke<sup>1</sup>, <sup>1</sup>Department of Poultry Science, Texas A&M University, College Station, TX, <sup>2</sup>USDA-ARS, College Station, TX, <sup>3</sup>Department of Soil & Crop Sciences, Texas A&M University, El Paso, TX.

*Salmonella typhimurium*

The development of effective bioaerosol sampling methods is critical considering the importance of pathogen laden bioaerosols on public health