

Metabolism and Nutrition—Vitamins and Minerals

459P Effects of early imprinting and replacing inorganic Zn with different levels of Zn proteinate in broiler diets on growth performance and tissue zinc status of broiler chicks. S. Mwangi^{*1}, T. Ao², J. Timmons¹, M. Paul², L. Macalintal², A. Pescatore², A. Cantor², and M. Ford², ¹University of Maryland Eastern Shore, Princess Anne, MD, ²Alltech-University of Kentucky Nutrition Research Alliance, Lexington, KY.

Dietary manipulation early in life has been shown to affect the development of broiler chickens later in life. The goal of this study was to evaluate the effect of feeding a zinc (Zn) deficient diet during the first 96 h post-hatch and dietary supplementation of different levels and sources of Zn on the growth performance, tissue and excreta Zn content using a RCB with a 2 × 5 factorial arrangements of treatments. Four hundred twenty (1 d old) male broiler chicks were divided into 2 groups. One group was fed a corn-soy basal diet containing 25 mg of Zn/kg. The second group was fed the basal diet supplemented with 40 mg of Zn/kg. Both diets were fed for 96 h. At d 5, chicks from each group were randomly assigned to the dietary treatments consisting of the basal diet alone or the basal diet supplemented with 8 or 40 mg/kg Zn as zinc oxide or Zn proteinate. There were no significant interactive effects between 2 factors. Early Zn imprinting decreased ($P < 0.05$) feed intake and increased ($P < 0.05$) gain to feed ratio in 21d growing period. Chicks fed low Zn diet in first 96 h had lower ($P < 0.05$) Zn content in the tibia ash and excreta samples and higher ($P < 0.05$) Zn content in the pancreas tissue compared with those fed diets containing recommended level of Zn. Chicks fed the diet supplemented with 8 mg of Zn as Bioplex Zn had higher ($P < 0.01$) Zn content in tibia ash compared with chicks fed a diet supplemented with 8 mg of Zn as Zn oxide. Chicks fed a diet supplemented with 40 mg of Zn as Bioplex Zn had higher ($P < 0.01$) Zn content in the pancreas tissue compared with chicks fed diet supplemented with 40 mg of Zn as Zn oxide. Results from this study suggested that Zn imprinting in the early life of chicks may increase Zn absorption permanently and the bioavailability of Bioplex Zn is higher than that of Zn oxide based on tissue Zn concentrations.

Key Words: imprinting, excreta, proteinate, bioavailability, zinc

460P Comparison of selenium sources and time of supplementation on performance, lipid peroxides, and tissue selenium concentration in broilers. V. A. Silva¹, A. G. Bertechini¹, B. R. F. Nogueira¹, H. Mazzuco^{*2}, and H. V. Ribeiro¹, ¹Federal University of Lavras, Lavras, MG, Brazil, ²EMBRAPA, Concórdia, SC, Brazil.

Scientific research confirm that yeast selenium (Y-Se) increase tissue Se deposition and enhance meat quality however, the limitation for the use of this source is its prohibitive cost, 20 times more expensive than the inorganic source, sodium selenite (S-Se – 45.6% of Se) commonly used in animal feeds. In the present study, Y-Se (2,000 ppm of Se) was used in combination or not with S-Se in a corn-soybean meal diet (0.095 ppm of analyzed Se). A total of 1,200 broilers (Ross 308) were randomly allocated to 6 treatment groups (8 replicate/25 birds). The treatments were different periods of birds age Se supplementation (0.300 ppm) of inorganic and/or organic source: S-Se (1–42 d), Y-Se (1–42 d); S-Se (1–14d) + Y-Se (15–42 d); S-Se (1–21 d) + Y-Se (22–42 d); S-Se (1–28 d) + Y-Se (29–42 d); S-Se (1–35 d) + Y-Se (36–42 d). Liver and breast Se concentration, tissue chemical composition, breast TB-reactive substances (TBARS) and carcass yield were obtained from 2 birds/experimental unit at 42 d of age. Data were subject to ANOVA

and significant differences among treatment means obtained by Tukey test at $P < 0.05$. No differences ($P > 0.05$) in growth performance and yield, hepatic Se concentration, meat quality attributes such as visual color quality of breast muscle, pH, water holding capacity and muscle shear force. Breast muscle Se content was 1.067 mg/kg (weight basis) in the treatment where Y-Se supplemented the broiler diets during the last 7 d of the experimental period, and not different ($P > 0.05$) of a deposition of 1.130 mg/kg (weight basis) when Y-Se was used during 1–42 d. Lower breast muscle Se concentration (0.693 mg/kg, $P < 0.01$) was observed in the treatment where S-Se supplemented the diets during the entire experimental period (1–42 d). These results show that there is no need to include Y-Se from day one to achieve significant Se contents in breast meat besides to reduce the feed cost.

Key Words: breast yield, feed cost, TBARS

461P Organic trace minerals on performance and carcass yield of broilers in summer season. D. E. Faria^{*}, A. R. M. Caniatio, D. E. F. Filho, V. C. Caetano, L. F. Demuner, D. Suckeveris, and B. H. C. Pacheco, Faculty of Animal Science and Food Engineering, Pirassununga, São Paulo, Brazil.

The minerals in organic form are molecules of high bioavailability with better utilization by birds in relation to inorganic sources. The purpose of this study was to evaluate the use of different levels of organic minerals copper (Cu), iron (Fe), manganese (Mn), selenium (Se), and zinc (Zn) in the diet of broiler chickens on performance and carcass yield in summer season (January to March), with environmental temperature ranged from 17 to 35°C, and relative humidity of the air from 43 to 95%. In total, 1,080 Cobb-500 male chicks were used in a completely randomized design with 6 treatments and 6 replicates of 30 birds each from 1 to 42 d of age. The treatments were as follows: T1: control (inorganic minerals Cu, Fe, Mn, Se, and Zn according to Rostagno et al., 2011), T2: organic minerals, T3: reduction of 1/3 from T2, T4: reduction of 2/3 from T2, T5: increase of 1/3 from T2, and T6: increase of 2/3 from T2. The levels of organic minerals (T2) in the diets were as follows: Pre-starter (Cu 12.5, Fe 62.5, Mn 88.0, Zn 81.3, and Se 0.375 mg/kg), Starter (Cu 11.0, Fe 55.0, Mn 77.0, Zn 71.5, and Se 0.330 mg/kg), Grower (Cu 10.0, Fe 50.0, Mn 70.0, Zn 65.0, and Se 0.300 mg/kg), and Withdrawal (Cu 7.5, Fe 37.5, Mn 53.0, Zn 48.8, and Se 0.225 mg/kg). Performance characteristics evaluated were feed intake (FI), weight gain (WG), body weight (BW), feed conversion (FC) and productive efficiency index (PEI). At 42 d, 20% of the flock were selected for evaluation of carcass yield and commercial cuts: wing, breast, thigh and drumstick. Data were analyzed by ANOVA using Proc GLM of SAS (2004). The comparison among treatments was performed by regression and between the sources of minerals (organic and inorganic) was used contrast. For performance characteristics, only the FI showed a positive quadratic effect ($y = 249.24x^2 - 543.27x + 4541.2$; $P < 0.05$), with lower consumption for the treatment T2. There was no difference among diets for carcass yield and commercial cuts. Organic minerals can be used at lower levels than current recommendations for inorganic minerals without affecting the performance and carcass yield of broilers in summer season.

Key Words: bird, microelements, mineral availability, nutrition, season