

hens ($P < 0.05$). However, on d 8, H-AF hens liver wt was greater than the liver wt of H-CF hens ($P < 0.05$). The ratio of ileum weight and length was reduced in both H-CF and H-AF hens compared with their controls ($P < 0.05$) on d 1; while H-CF hens tended to be different on d 8 ($P = 0.08$). H-CF hens ate less than C-CF hens during d 1, 3, 6, and 8 ($P < 0.01$) while H-AF hens ate less than controls during d 3 and 6 only ($P < 0.01$). Partial pressure CO₂ (pCO₂), HCO₃⁻, and total CO₂ of cardiac blood of H-CF hens was lower than C-CF hens ($P < 0.05$) on d 8. However, only pCO₂ was decreased in H-AF hens compared with controls ($P < 0.05$). Low pCO₂, HCO₃⁻, and total CO₂ are indicative of respiratory alkalosis or metabolic acidosis that can onset under HS through excess hyperventilation. These data suggest that hens exhibit a negative response under HS. Evidence is provided that hens fed AF have an improved coping capability to HS.

Key Words: heat stress, antioxidant, well being, laying hen, blood gas

115 Live performance and energy uplift of 0.5% Azomite Feed-Grit (versus 0%) were evaluated in broiler feeds in two series with increasing levels of metabolizable energy under disease stresses in floor pens. J. L. McNaughton¹, D. Fodge², W. W. Emerson³, and D. M. Hooge⁴, ¹AHPharma Research Inc., Salisbury, MD, ²DF International Inc., Rockville, MD, ³Azomite Mineral Products Inc., Kansas City, MO, ⁴Hooge Consulting Service Inc., Eagle Mountain, UT.

Azomite Feed-Grit (AZO; Azomite Mineral Products, Inc., Kansas City, MO) was included at 0 or 0.5% in broiler diets in 2 series with increasing metabolizable energy (ME) to study live performance and energy uplift effects. The AZO is a hydrated Na-Ca aluminosilicate, from a volcanic ash and an ancient seabed deposit in Utah, which has been shown to improve caloric conversion. Mash feeds were in 3 phases (starter 0–21 d, grower 21–35 d, and finisher 35–42 d) with respective ME levels of 3,086, 3,142, and 3,197 kcal ME/kg and +0, +22, +66, or +132 kcal ME/kg. In the 0.5% AZO series of diets, soybean oil was added to make formulas equicaloric with corresponding 0% control diets. A total of 4,320 straight-run broiler chicks were randomly allocated at 54 chicks/floor pen into 10 replicate pens for each of the 8 treatments (4 with 0% and 4 with 0.5% AZO). Stocking density was 0.0743 m² (0.8 ft²)/bird on used litter. A live coccidia vaccine was given at hatch, and BMD (55 ppm) was used in all diets. *Eimeria acervulina* (100,000 oocysts/bird) and *maxima* (50,000 oocysts/bird) were given on d 5, *Clostridium perfringens* (10⁴/bird) on d 8, and *E. coli* (10⁶/bird), *Salmonella* spp. (10⁴/bird), *Listeria monocytogenes* (10⁶/bird), and *Campylobacter jejuni* (10⁴/bird) by oral gavage on d 40. The 42-d BW was 2.545 kg for the 0% and 2.578 kg for the 0.5% AZO groups ($P = 0.056$). The 0–42 d feed conversion ratio (FCR) was 1.834 for 0% and 1.817 for 0.5% AZO groups ($P = 0.007$), and mortality-adjusted FCR was 1.831 for 0% and 1.813 for 0.5% AZO groups ($P = 0.002$). Mortalities were similar (1.71 vs 2.04%, respectively; $P = 0.494$). The AZO at 0.5% was estimated to have 7,910 kcal ME/kg (3,588 kcal/lb) 0–21 d, 10,194 kcal ME/kg (4,624 kcal/lb) 21–42 d, and 9,744 kcal ME/kg (4,420 kcal/lb) of product 0–42 d. The AZO (a noncaloric ingredient) at 0.5% of diets increased effective ME level by 48.72 kcal ME/kg (22.10 kcal/lb) feed from 0 to 42 d.

Key Words: Azomite, broiler, coccidia, metabolizable energy, pathogens

116 Growth response of broiler chickens to inclusion of hydrolyzed porcine mucosa (Palbio) in diets varying in total lysine content. M. Mohiti-Asli¹, M. Frikha¹, C. Jabbour¹, E. Borda², L. Cámara¹,

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The growth response of broiler chickens to the inclusion of hydrolyzed porcine intestinal mucosa (PAL, Palbio 50 RD; Bioibérica, Spain) in diets varying in total lysine (Lys) content was studied in 2 experiments (Exp.). In Exp. 1, 1,200 one day-old, straight-run Ross 308 chicks were allotted randomly to 8 dietary treatments with 5 pen floor replicates of 30 chicks each. The design was completely randomized with treatments arranged as a 4 × 2 factorial with 4 inclusion levels of PAL (0, 2.5, 5.0, and 7.5%) and 2 levels of Lys (1.23 and 1.37%). Birds received their respective experimental diets from 1 to 21 d and then a common diet without PAL from 21 to 37 d of age. Lys level did not affect ADG in any of the periods considered but final BW tended to be higher (2,662 vs. 2,707 g; $P = 0.063$) for birds fed the higher Lys level. The inclusion of PAL tended to improve ADFI ($P = 0.08$) and improved BWG ($P \leq 0.05$) and FCR ($P \leq 0.001$) from 1 to 21 d of age. Previous treatment did not affect broiler performance from 21 to 37 d of age. Litter quality was not affected by diet. In Exp. 2, the same diets used from 1 to 21 d in the previous study were used from 1 to 37 d of age. For the entire experiment, birds were kept in cages and each of the 8 treatments was replicated 5 times (7 birds each). Birds fed 1.37% Lys had higher ADFI and ADG ($P \leq 0.01$) than birds fed 1.23% Lys. The inclusion of PAL improved ADFI and ADG from 1 to 21 d ($P \leq 0.01$) and from 1 to 37 d ($P \leq 0.05$) of age, with best results observed with 2.5 to 5.0% PAL. Moisture content of the excreta was not affected by dietary treatment. The results indicate that PAL inclusion improves growth performance of broilers and that the most efficient level of inclusion is between 2.5 and 5.0%, irrespective of dietary Lys level. Moreover, broilers respond better to diets with 1.37% Lys than to diets with 1.23% Lys.

Key Words: broiler performance, lysine, hydrolyzed porcine digestive mucosa

117 Impact of replacing canola meal with distillery yeast sludge on growth performance, haematology, histopathology and growth performance of broilers. J. I. Sultan*, I. Haider, A. Javaid, and M. Yaqoob, University of Agriculture, Faisalabad, Faisalabad, Punjab, Pakistan,

The intent of this study was to determine the chemical profile and to explore the impact of replacing canola meal with distillery yeast sludge (DYS) on hematology, histopathology, growth performance and economics of broiler chicks. Two hundred 40 (240) day-old broiler chicks were randomly divided into 20 experimental units in such a way that each diet was offered to 4 experimental units comprising 12 chicks. Five isonitrogenous (CP, 21%) and isocaloric (ME, 3000 Kcal/kg) broiler diets i.e., control, DYS5, DYS10, DYS15 and DYS20 were formulated having 0, 5, 10, 15 and 20% DYS replacing canola meal. The trial was 42 d long. Feed intake remained unaltered across all diets. Weight gain of chicks fed control diet was higher ($P < 0.05$) than those fed DYS20, however, it was similar to those fed other diets. Feed conversion ratio was lower ($P < 0.05$) in chicks fed control diet than those fed DYS20, however, it was similar across other diets. Red blood cells, white blood cells, packed cell volume and hemoglobin values remained unchanged with increasing the inclusion level of DYS in the diet. No pathological lesions on heart, kidney and liver were observed across any diet. Feed cost per kg live weight gain decreased ($P < 0.05$) as the level of DYS was increased in the diet. Based on the findings of the present study it was concluded that DYS is economical protein