

# **Poultry Science**

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January 26-27, 2015

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## Metabolism and Nutrition: Feed Additives

**401P Dietary  $\alpha$ -lipoic acid supplemented with vitamins C and E improves growth performance and meat quality traits of broiler chickens under the moderate heat stress.** J. Yoo<sup>1</sup>, B. Koo<sup>1</sup>, S. Jung<sup>1</sup>, C. W. Lee<sup>1</sup>, Y. J. Yi<sup>2</sup>, J. U. Yoon<sup>3</sup>, H. B. Kang<sup>3</sup>, D. H. Lee<sup>3</sup>, and J. M. Heo<sup>\*1</sup>, <sup>1</sup>Department of Animal Science and Biotechnology, Chungnam National University, Daejeon, Republic of Korea, <sup>2</sup>Division of Biotechnology, Chonbuk National University, Iksan, Republic of Korea, <sup>3</sup>Biogenoci Co. Ltd., Seoul, Republic of Korea.

A total of 288 one-day-old male Ross-308 were used in a completely randomized design and allotted to one of 6 dietary treatments to give 6 replicates per treatment (8 birds per cage). The 6 dietary treatments were (1) a corn-soybean meal-based (NC; no antimicrobial compounds added) with (2) 8 ppm  $\alpha$ -lipoic acid (ALA), (3) 150 ppm vitamin C and 75 ppm vitamin E (E-75), (4) E-75 plus ALA (E-75-ALA), (5) 150 ppm vitamin C and 50 ppm vitamin E (E-50) plus ALA (E-50-ALA), or (6) 150 ppm vitamin C and 25 ppm vitamin E (E-25) plus ALA (E-25-ALA). Birds were housed in a battery cage (n = 36), and were offered dietary treatments continuously as a liquid form. The ambient temperature was maintained at  $32 \pm 1^\circ\text{C}$  throughout the study to induce moderate heat stress. Body weight and feed intake were measured weekly. One bird per pen (n = 6), and one another bird per pen (n = 6) were euthanized to obtain terminal ileum to measure villous height and crypt depth at d 21, and to harvest breast meat and drumsticks to evaluate meat quality traits at d 35, respectively. Dietary treatment E-75-ALA improved ( $P < 0.05$ ) body weight and average daily gain compared with birds fed other dietary treatments from d 1 to d 35. Birds fed dietary treatment E-75-ALA and E-50-ALA had higher ( $P < 0.05$ ) villous height but only birds fed E-75-ALA had shorter crypt depth ( $P < 0.05$ ) than those fed other dietary treatments at d 21. Furthermore, birds fed E-75-ALA had higher ( $P < 0.05$ ) DPPH radical scavenging activity both in breast meat and drumsticks compared with those fed other dietary treatments at d 35. Dietary treatments E-75-ALA and E-50-ALA reduced ( $P < 0.05$ ) thiobarbituric acid reactive substance (TBARS) in drumsticks compared with other dietary treatments but only dietary treatment E-75-ALA decreased ( $P < 0.05$ ) TBARS in breast meat at d 35. The results suggest that liquid form of antioxidant E-75-ALA can improve growth performance, histology of terminal ileum and meat quality traits in broiler chickens under moderate heat stress for 35 d.

**Key Words:**  $\alpha$ -lipoic acid, antioxidant, broiler chicken, growth performance, meat quality

**402P Effect of aflatoxin and a commercial anti-mycotoxin additive on performance, egg quality, and liver integrity of brown layers.** Carlos A. Mallmann<sup>1</sup>, Diego Sturza<sup>2</sup>, Leandro Giacomini<sup>2</sup>, Manuel Contreras<sup>3</sup>, and Douglas Zaviezo<sup>\*3</sup>, <sup>1</sup>Universidade Federal de Santa Maria, Laboratorio de Analises Micotoxicologicas LAMIC, Santa Maria, RS, Brazil, <sup>2</sup>Instituto Samitec, Santa Maria, RS, Brazil, <sup>3</sup>Special Nutrients, Miami, FL.

The deleterious effects of aflatoxin (AFB) have been reported in layers but its effect on blood-meat spots and the efficacy of anti-mycotoxin additives have not been evaluated thoroughly. A study was conducted to evaluate aflatoxin damages and the preventing efficacy of Myco-ad in brown layers. One hundred twenty 39-wk-old ISA Brown layers already in production were transported to the experimental facilities of Samitec and distributed using a completely randomized design into 3 treatments with 4 replicates of 10 layers each in communitarian cages with slatted floor. After a one-week adaptation period, layers were fed the experimental corn-soy diets at a fixed intake (120 g/bird), following the genetic guide. All ingredients used were tested free of mycotoxins. Treatments were (1) control diet; (2) control +

3 ppm AFB and (3) control + 3 ppm AFB + 0.25% Myco-ad (mycotoxin binder). AFB was produced by LAMIC. Liver tissues were evaluated histopathologically in the US. Significant ( $P < 0.05$ ) deleterious effects of AFB on performance were observed only after 21 d of consuming the contaminated diet. Results after 41 d of exposure indicated that layers fed AFB presented significantly ( $P < 0.05$ ) decreased egg production (31%), reduced egg mass (32%), poorer feed conversion (44%), increased incidence of blood-meat spots (25%), heavier relative liver weight (29%), and greater severity of microscopic liver damage (83%) than layers fed the control diet. The addition of 0.25% Mycoad significantly ( $P < 0.05$ ) improved egg production (28%), egg mass (29%) and feed conversion (29%); with a significant reduction in the incidence of blood-meat spots (9%), relative liver size (11%) and the severity of microscopic liver damage (53%) observed in layers fed AFB. These results indicated that 0.25% Mycoad was effective in preventing the toxic effects of AFB in brown layers.

**Key Words:** Myco-ad, aflatoxin, blood-meat spots, brown layers

**403P Effect of several mycotoxins and two commercial anti-mycotoxin additives on performance, egg quality and liver integrity of brown layers.** Carlos A. Mallmann<sup>1</sup>, Diego Sturza<sup>2</sup>, Leandro Giacomini<sup>2</sup>, Manuel Contreras<sup>3</sup>, and Douglas Zaviezo<sup>\*3</sup>, <sup>1</sup>Universidade Federal de Santa Maria, Laboratorio de Analises Micotoxicologicas LAMIC, Santa Maria, RS, Brazil, <sup>2</sup>Instituto Samitec, Santa Maria, RS, Brazil, <sup>3</sup>Special Nutrients, Miami, FL.

A study was conducted to evaluate the combined toxic effects of aflatoxin (AFB) + fumonisin (FUM) + T-2 toxin (T2) and the preventing efficacy of Myco-ad+Myco-ad AZ in brown layers. One hundred twenty 39-wk-old ISA Brown layers already in production were transported to the experimental facilities of Samitec and distributed using a completely randomized design into 3 treatments with 4 replicates of 10 layers each in communitarian cages. After a one-week adaptation period, layers were fed the experimental corn-soy diets at a fixed intake (120 g/bird), following the genetic guide. All ingredients used were tested free of mycotoxins. Treatments were: (1) control diet; (2) control+3 ppm AFB+10 ppm FUM+1 ppm T2 and (3) control+3 ppm AFB+10 ppm FUM+1 ppm T2+0.25% Myco-ad+0.1% Myco-ad AZ. All mycotoxins were produced by LAMIC. Liver tissues were evaluated histopathologically in the US. Significant ( $P < 0.05$ ) deleterious effects of AFB+FUM+T2 on performance were observed only after 21 d of consuming the contaminated diet. Results after 41 d of exposure indicated that layers fed AFB+FUM+T2 presented significantly ( $P < 0.05$ ) decreased egg production (37%), reduced egg mass (38%), poorer feed conversion (48%), increased incidence of blood-meat spots (32%), heavier relative liver weight (41%), and greater severity of microscopic liver damage (78%) than layers fed the control diet. The addition of 0.25% Myco-ad+0.1% Myco-ad AZ significantly ( $P < 0.05$ ) improved egg production (33%), egg mass (32%) and feed conversion (22%); with a significant reduction in the incidence of blood-meat spots (16%), relative liver weight (15%) and the severity of microscopic liver damage (27%) observed in layers fed AFB+FUM+T2. These results indicated that 0.25% Myco-ad+0.1% Myco-ad AZ were effective in preventing the combined toxic effects of AFB+FUM+T2 in brown layers.

**Key Words:** Myco-ad, aflatoxin, fumonisin, T-2 toxin, brown layers

**404P Efficacy of a plant alkaloid extract in broilers in a dose-dependent manner.** Anja Pastor<sup>\*1</sup> and Marta I. Gracia<sup>2</sup>, <sup>1</sup>Phytobiotics Futterzusatzstoffe GmbH, Eltville, Germany, <sup>2</sup>IMASDE Agroalimentos, Madrid, Spain.