

metabolism. The chicks were allocated to 4 treatments, each of which had 4 pens of 25 birds per pen. The dietary treatments were basal diet only (control group), basal diet + 250 mg/kg mixture of monoglyceride and sucrose ester (MSE), basal diet + 500 mg/kg MSE and basal diet + 500mg/kg lecithin. Six randomly selected birds from each treatment were slaughtered for the serum and intestinal contents. Compared to the control, supplementation with 250 mg/kg MSE increased average daily gain (ADG) by 6.69% during the whole period ($P < 0.05$). Supplementation with 500 mg/kg lecithin increased the ADG by 4.68% compared with the control diet. However, there are no significant effects in feed efficiency (F/G) and survive rate between control and emulsifier treatment. Supplementation with 250 mg/kg MSE significantly increased the fat digestibility. Chicks fed with 250 mg/kg MSE or 500 mg/kg lecithin had lower serum triglyceride (TG3) and higher serum volatility fatty acid (VFA) than those in control. No significant difference was found in serum total cholesterol (TC), high density lipoprotein cholesterol (HDL-C) and low density lipoprotein cholesterol (LDL-C) between the control and emulsifier diet. Lipase of intestinal contents was not affected by emulsifier treatment.

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Key Words: broiler, fat, emulsifier, metabolism, growth performance

325P In vitro characterization of various clay minerals to bind aflatoxin B1. S. Fruhauf¹, D. Schatzmayr², E. Vekiru¹, and G. Schatzmayr*², ¹Christian Doppler Laboratory for Mycotoxin Research, Tulln, Austria, ²BIOMIN Research Center, Tulln, Austria.

Aflatoxin B1 (AFB1) causes a variety of effects in poultry resulting in decreased performance. Aflatoxins are the only class of mycotoxins which can be efficiently counteracted by adsorbents. A great variety of binding agents is available and therefore *in vitro* screening procedures are needed to characterize and select suitable adsorbents. The aim of the study was to investigate clay based binding materials concerning their ability, specificity and capacity to adsorb AFB1. 7 bentonites (R, C2, MB, B7, M32, M34) and one zeolite (Z08) were tested in this study. The material R is scientifically well described and served as a reference. All materials were regarded as good aflatoxin binders based on results from standard *in vitro* assays using 0.1% of the binding agent in a buffer solution spiked with 200 µg/l of AFB1. In this study adsorption tests under intensified conditions (0.02% adsorbent, 4 mg/l AFB1) and in gastric juice were carried out. Additionally, isothermal analysis was performed in order to determine the binding agents' affinity and capacity to bind AFB1. At pH7 all bentonites except M32 were able to bind more than 90% of the aflatoxin. The zeolite only bound 22% of AFB1. At pH5 all bentonites except C2 were able to adsorb more than 90% of the AFB1. C2 bound 64% of AFB1 and Z08 9%, respectively. In the gastric juice MB and B7 adsorbed more than 80% of the toxin, R, C2, M32, M34 and M5 bound between 50 and 70% of the toxin whereas Z08 reduced the AFB1 concentration only by 6.4%. Isothermal analysis was carried out to determine the maximal binding capacity (Qmax, mol/kg) of each test substance. The Qmax values of MB (0.442 mol/kg), B7 (0.405 mol/kg), M32 (0.442 mol/kg), M34 (0.370 mol/kg) and M5 (0.394 mol/kg) were higher than that for the reference (0.364 mol/kg). C2 (0.263 mol/kg) and Z08 (<0.1 mol/kg) were below the reference. Based on the results obtained in this study, the clay materials could be categorized in good (R, MB, B7, M2, M34, M5), average (C2) and poor (Z08) adsorbents. However, feeding experiments with AFB1 challenged birds have to be carried out to confirm *in vitro* results with *in vivo* performance.

Key Words: aflatoxin, adsorption, mycotoxin, detoxification, adsorbents

326P Investigation of replacing vitamin E with EconomasE[®] in broiler diet. J. L. Pierce*¹, T. Ao¹, R. F. Power¹, K. A. Dawson¹, A. J. Pescatore¹, A. H. Cantor¹, M. J. Ford¹, and Y. L. Xiong², ¹Alltech-University of Kentucky Nutritional Research Alliance, Lexington, ²University of Kentucky, Lexington.

EconomasE[®] is a proprietary blend of ingredients that maximizes antioxidant status of the animal and reduces the requirement of vitamin E (VE). A study was conducted to investigate the effects of supplementing EconomasE[®] in broiler diet on the performance, oxidative stability, meat quality and storage stability of broiler chicks. Dietary treatments included: 1) corn-soy control diet supplemented 0.3 ppm Se as selenite, but no VE; 2) corn-soy control diet supplemented 0.3 ppm Se as selenite, plus 50 IU/kg VE; 3) corn-soy control diet supplemented 0.3 ppm Se as selenite, plus 100 IU/kg VE; 4) corn-soy control diet, plus 200 g/Ton EconomasE[®]. A total of 640 chicks was raised for six weeks. Eight replicate cages of 20 chicks were randomly assigned to each of four dietary treatments. Chicks were housed in floor pens with new litter in an environmentally controlled room and were given *ad libitum* access to feed and water. No significant difference among all the treatments was observed in terms of weight gain and feed intake. The breast meat from chicks fed EconomasE[®] showed better color stability and less amount of drip loss compared with that from chicks fed other treatment diets. The total antioxidant capacity of serum from chicks fed EconomasE[®] was the same as that from chicks fed additional 50 or 100 IU/kg VE and was higher ($P < 0.01$) than that from chicks fed control diet. The breast muscle from chicks fed EconomasE[®] had higher ($P < 0.01$) Se content than other treatment groups. No dietary effect on breast muscle VE content was detected. The results from this trial showed that supplementing EconomasE[®] in broiler diet had the same or better effects on performance, meat quality and total antioxidant capacity of chicks compared with dietary supplementation of 0.3 ppm Se as selenite plus 50 or 100 IU/kg VE.

Key Words: broiler chick, selenium, vitamin E

327P Comparison the effect of a commercial Echinacea purpurea extract, levamisole and vitamin E on blood parameters and performance in broilers. S. N. Khaleghi Miran¹, M. R. Bassami*^{2,4}, M. A. Karimi Torshizi¹, and R. Toroghi³, ¹Tarbiat Modares University, Tehran, Iran, ²Ferdowsi University of Mashhad, Mashhad, Iran, ³Razi Vaccine & Serum Research Institute, Mashhad, Iran, ⁴The Research Institute of Biotechnology, Ferdowsi University of Mashhad, Mashhad, Iran.

This study was conducted to determine the effect of *Echinacea purpurea*, levamisole and vitamin E on blood parameters and performance of broilers in a 42 d study. A total of 200 broilers were distributed in a completely randomized design to 4 treatments with 5 replicate floor pens with 10 birds/pen. Experimental groups included control, vitamin E (150 mg/kg diet), 0.1% aqueous *Echinacea*, or levamisole (15 mg/kg B.W). Daily weight gain, daily feed consumption, and daily feed conversion ratio were assessed. Total Cholesterol (TC), LDL cholesterol, triglycerides (TG), and HDL cholesterol were measured at the completion of the experiment. The data were analyzed by GLM procedure of SAS.

There was a significant difference between vitamin E and the rest of the groups in terms of daily weight gain and daily feed consumption ($P < 0.01$). Feed conversion ratio was not affected by the treatments ($P > 0.05$), except that the vitamin E and *Echinacea* groups had a significant difference for HDL ($P < 0.07$). There were no significant differences among all other groups for other blood parameters. The results confirm the positive effect of *Echinacea* on HDL and LDL, without