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BOOK OF ABSTRACTS

PS6 - Unsolved issues in poultry nutrition**PS6-002 Dietary supplementation with sodium butyrate: live performances, carcass traits and myopathy occurrence in female and male broilers**

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The present study aimed to evaluate the effect of different inclusion levels of sodium butyrate in diets with two fat levels on growth performances and myopathies occurrence in broiler chickens of both sexes. A total of 900 one-day-old chicks (Ross 308) were allocated to 36 pens according to a 2 × 3 × 2 factorial design encompassing two fat inclusion levels (lower fat-grower diet: 6.7%; finisher diet 7.7%; and higher fat-grower diet: 7.7%; finisher diet: 8.9%), three levels of microencapsulated sodium butyrate (0 mg/kg, 150 mg/kg and 300 mg/kg) and two sexes (3 pens per experimental group). As expected, a higher fat diet resulted in greater body weight (P<0.001), average daily gain (P<0.001), and better feed conversion ratio (P<0.001) compared to chickens fed a lower fat diet, whereas feed intake was not affected (P>0.10). The chickens fed a higher fat diet had higher cold carcass weight (P<0.01) and dressing percentage (P<0.05), and greater Pectoralis major yield (P<0.05) in comparison with birds fed a lower fat diet. Sodium butyrate supplementation did not affect growth performance nor slaughter yield and carcass traits (P>0.05). Compared to males, female chickens had lower body weight, weight gain, and feed intake (P<0.001) and worse feed conversion rate (P<0.001). In addition, females had higher dressing percentage (P<0.001), and greater breast and P. major yields (P<0.001) in comparison with males. Furthermore, no interactions between sodium butyrate and fat inclusion level, nor sodium butyrate and sex were observed. At gross examination, regardless of the experimental factors, the occurrence of myopathies was 56.25% for white striping (WS), 24.31% for wooden breast (WB), and 7.64% for spaghetti meat (SM). The occurrence of WB was higher in males than in females (18.75% vs. 5.56%; P<0.01), whereas SM showed an opposite trend (6.94% in females vs. 0.69% in males; P<0.05). Moreover, the high-fat diet increased the occurrence of WS (34.72% vs. 21.53%; P < 0.01) and SM (6.94 vs. 0.69%; P<0.05). Finally, the overall occurrence of WS, WB, and SM were not affected (P>0.05) by the butyrate addition. In conclusion, sex and dietary fat level affected the growth and myopathy occurrence. In contrast, butyrate did not modify performances and breast abnormalities, while effects at the gut level have to be investigated. Funding: The grant of M. Boskovic Cabrol was supported by the DEMyo project (No 101063055) funded by the European Commission under the HORIZON-MSCA-2021-PF-01 call.

PS6 - Unsolved issues in poultry nutrition**PS6-003 Effect of 125% and 135% arginine diets on growth performance and immunological response to necrotic enteritis in broilers**

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Legislative restrictions on the prophylactic use of antibiotics in feed led to the reemergence of necrotic enteritis (NE) in poultry, necessitating the need to develop alternatives to in-feed antibiotics. Arginine is an essential amino acid that is the substrate for nitric oxide and ornithine biosynthesis. Arginine can modulate the immune response of birds to the Eimeria challenge by regulating macrophage polarization and subsequent inflammatory pathways. This study evaluated the effects of 125% and 135% L-arginine on the production performance and immunological responses in necrotic enteritis (NE) challenged broilers. A total of 480 day-old chicks were randomly allocated into four treatment groups consisting of 6 replicates each: 1. Uninfected +basal diet 2. NE +basal diet 3. NE +125% arginine diet and 4. NE +135% arginine diet. The basal diets were formulated to meet or exceed Cobb-500 nutrient requirements. NE was induced by inoculating 1×10⁴ sporulated Eimeria maxima oocysts on day 14 and 1×10⁸ CFU C. perfringens on day 19,20,21 of age. All data were analyzed by ANOVA and the means were compared by Tukey's HSD and were considered significantly different at P ≤ 0.05. NE infection significantly increased the feed conversion ratio (FCR) (p< 0.01), intestinal permeability (p= 0.02), jejunal lesion score (p< 0.01), and the ratio of CD4+:CD8+ cells in cecal tonsils (p= 0.02) and decreased the body weight gain (BWG) (p< 0.01), and bile anti-C. perfringens IgA concentration (p= 0.04). Arginine supplementation did not reverse the NE-induced loss in BWG, and intestinal permeability nor did have a significant effect on the NE lesion score of the birds. 135% arginine increased the FCR by 10 points (p = 0.01) at day 35. 125% arginine diet significantly increased the bile anti-C. perfringens IgA concentration by 37.5% (p = 0.02) on day 28. 125% and 135% arginine diets significantly decreased the ratio of CD4+:CD8+ cells in the cecal tonsils on day 28 (p= 0.03) and day 35 (p= 0.01). To conclude, the 125% arginine diet, can be used in combination with other feed additives to partially replace antibiotics in broilers due to its immunomodulatory effects.