

EFFECT OF SUPPLEMENTATION WITH MANGANESE AND CHONDROITIN SULPHATE ON CARCASS TRAITS AND BROILER MEAT QUALITY

J. A. Muñoz¹*, T. S. Martins², T. A. J. Sant'Ana², P. L. M. Garbossa², L. F. Mueller¹, A. M. Ferrinho¹, G. V. de Moura¹, I. H. S. Fuzikawa¹, J. L. Gemelli¹, T. R. Amorim¹, H. C. Rocha², L. B. Ferreira¹, C. B. Barbalho¹, M. M. da Silva¹, M. D. Poleti¹, and A. S. C. Pereira²,

¹*Department of Animal Science, Faculty of Animal Science and Food Engineering, University of Sao Paulo, São Paulo, Brazil,*

²*Department of Animal Nutrition and Production, School of Veterinary Medicine and Animal Science, University of São Paulo, Pirassununa, Brazil,*

*julianmunoz@usp.br

I. OBJECTIVES

The goal of this study was to verify whether different levels of chondroitin sulphate (CS) and manganese (Mn) could influence the presence of myopathy, macroscopic measurements of breast, carcass traits, and quality of broiler breast meat.

II. MATERIALS AND METHODS

A total of 1,152 male Cobb chicks were housed during 47 d and distributed in a completely randomized design, in a 4 × 3 factorial arrangement: 4 doses of CS (0.00%, 0.06%, 0.12%, and 0.18%) and 3 doses of Mn (0, 40, and 80 mg/kg), totaling 12 treatments of 8 repetitions with 12 birds each. In the slaughter process, one breast was collected per experimental unit to verify the presence of white striping myopathy and to perform macroscopic analysis (area, width, and length). After 24 h of chilling, the carcasses were weighed to calculate the yield. During boning, the breasts, thighs, drumsticks, and wings were weighed to calculate the yield of the cuts. Then, 3 breasts per experimental unit were collected to determine the meat quality by analyzing pH, color (CIELAB system: L^* , a^* , and b^*), cooking loss, and shear force. The results were submitted to analysis of variance and the means compared by the Tukey test at 5% probability.

III. RESULTS

It was observed that CS and Mn supplementation levels did not influence ($P > 0.05$) carcass yields, macroscopic breast characteristics, nor the cooking loss, shear force, and luminosity (L^*) of broiler breasts. However, there was an effect ($P < 0.05$) on breast yield, with the highest percentages presented by the birds supplemented with 0.18% CS compared to the breasts of the diet without CS inclusion. There was interaction ($P < 0.05$) for thighs-drumsticks and wings yield, in which the highest yields for thighs and drumsticks were presented by diets without the inclusion of additives (CS and Mn) and it was evident that the different relationships between CS and Mn levels did not provide increases in thigh and drumstick yields. For the wings, the diet of greatest prominence was that formulated from 0.18% of CS and 80 mg/kg of Mn, since it presented the highest yields of wings. There was an effect ($P < 0.05$) of the CS levels in a^* values, where the highest levels of red were present in the breasts from 0.18% CS diet compared to those of the diet without added CS. The pH and b^* values were influenced by Mn levels ($P < 0.05$). The breasts from 0 mg/kg Mn diet had a higher b^* than the breasts of chickens that consumed the diet with 80 mg/kg Mn.

The 40 mg/kg Mn diet reached the highest pH values concerning the other Mn inclusion levels. Regarding the presence of myopathies, it was found that, regardless of CS or Mn levels, the breasts showed moderate white striping myopathy. However, it is noteworthy that the control diet without the inclusion of CS and Mn provided the breasts with the largest striation sizes (0.78 mm) when compared to the striations of the breasts of the diets of 0.18% CS and 80 mg/kg Mn (0.64 mm) and the diet of 40 mg/kg Mn (0.64 mm).

IV. CONCLUSION

The levels of CS and Mn were not sufficient to provide improved carcass traits and quality of breast meat. However, the levels of 0.18% CS and 80 mg/kg Mn may result in an interesting alternative for use in chicken feeding because it interacts with breast yields and the size of white striations, two aspects that influence the consumer in the initial selection and final satisfaction with the product.

Keywords: broiler chicken, glycosaminoglycans, mineral, myopathy