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Enriching of pre-cooked chicken sausages with eggshell powder: physicochemical, calcium and sensory attributes assessment

K.A.H.S. Kaluarachchi, T.I.G. Prabashwari, J.K. Vidanarachchi and S.M.C. Himali*

Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Peradeniya, 20400, Sri Lanka

Abstract

Enriching of Calcium in dietary products with chicken eggshell which has high bioavailability of calcium became a solution to provide dietary calcium intake for human. This study was aimed to evaluate the effect of enrichment of calcium with eggshell powder (ESP) on physicochemical and sensory attributes of pre-cooked chicken sausages. In this study, series of preliminary trails were conducted to select the best calcium incorporation level in chicken sausages by incorporating sterilized ESP (particle size $>32\ \mu\text{m}$). Four ESP enriched sausages; 0.50%, 0.75%, 1.00%, 1.25% (w/w) and control which had 0% calcium were prepared. The highest consumer acceptability was obtained by 1.00% (w/w) ESP incorporated sausage out of the 4 levels tested. The selected ESP enriched sausage and control were subjected to determining the calcium content and keeping quality parameters with three replicates per treatment. Color, water holding capacity (WHC), shear force, pH, 2-Thiobarbituric acid reactive substances (2-TBARS) and total aerobic viable counts (TAVC) were measured during three weeks of storage at -18°C . Complete Randomized Design (CRD) was used as the experimental design. With respect to the sensory attributes, 1.00% (w/w) ESP incorporated sausage had significantly higher values ($p<0.05$) compared to the control. The 1.00% (w/w) ESP enriched sausage showed significantly higher ($p<0.05$) pH value (6.6-6.8) and shear forces values ($2.8\pm 0.2\ \text{N}$) over to the control. There was no significant difference ($p>0.05$) in 2-TBARS and TAVC of the sausages during three weeks of the storage period. Therefore, the sausages were microbiologically sound and safe products for human consumption. The calcium content of 1.00% (w/w) ESP enriched sausage was 0.88% higher ($p<0.05$) than the control. Results of the current study revealed that the optimum level of ESP to be incorporated in chicken sausages was 1.00% (w/w) which can increase the calcium content of pre-cooked chicken sausage by 0.88% while maintaining favorable physicochemical and sensory attributes of sausages under ethical conditions.

Keywords: Calcium, Chicken sausage, Enrichment, ESP, Sensory

***Corresponding Author:** smchimali@agri.pdn.ac.lk