EVALUATION OF PHYSIOCHEMICAL CHANGES IN BOILED EGGS STORED AT DIFFERENT TEMPERATURE

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ABSTRACT

Eggs are consider as powerhouse of nutrients and also it is very popular food in the world due to its nutritional value. Among that hard boiled eggs are widely use in ready to eat food processing industry. However, storing of hard boiled eggs under refrigeration and freezing conditions lead to some problems including rejection of customer demands due to its textural changes. Objective of this study was to check effect of storing temperature on textural changes in egg white with time. Medium sized brown shell eggs collected from commercial layer farm and stored under Room temperature (27 ^{o}C), Refrigeration(4 ^{o}C) and Freezing(-18 ^{o}C) conditions for 0, 6, 12, 18, 24 and 48 hours. Then the stored eggs were boiled for 100 ^{o}C for 15 minutes and physiochemical changes were studied under Fourier transform infrared (FTIR) spectroscopy (ALPHA), texture profile analysis using Texture analyzer (CT3), visual observation done by using gemological microscope and color was measured using colorimeter (CR 410 Chromo meter). Sensory qualities were measured using 30 untrained panelists. According to the results, frozen eggs were showing low acceptance in all organoleptic properties checked ($p<0.05$). Hardness and gumminess of eggs were effected significantly during the storage in frozen eggs from the rest of the treatments ($p<0.05$). FTIR spectrums also confirm that the textural changes in bonds of amide A (3271 cm^{-1}), amide I (1626.2 cm^{-1}), amide II (1539.0 cm^{-1}), C=O stretch of COO^{-} (1397 cm^{-1}), asymmetric PO_2^{-} stretch (1240 cm^{-1}). However the color of the egg white did not show any significance difference ($p>0.05$). Sensory results reveal that frozen eggs after 12 hours did show low acceptance comparing the rest. As a conclusion storing temperature of un-boiled eggs has an effect to the texture of eggs after during boiling.

Key words: Un-Boiled eggs, FTIR, Temperature, Textural changes, Hardness