

EVALUATION OF PHYSIOCHEMICAL CHANGES OF RAW CHICKEN EGGS STORED AT DIFFERENT TEMPERATURES

A dissertation submitted to the
Faculty of Animal Science and Export Agriculture
Uva Wellassa University
in partial fulfillment of the requirement of
the degree of
Bachelor of Animal Science

by

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2017

ABSTRACT

Chicken eggs are widely used in the world, due to perishability which undergo deterioration with the time and affects with egg processing industry and to economic losses. Refrigeration is very effective in preserving egg quality. In this study, physiochemical changes of raw chicken eggs (RCE) stored at room temperature (28-31°C) and refrigeration temperature (4°C) were determined. A total of 111 medium sized white shelled RCE obtained from 61-wk old Hyline White hens were analyzed for weight loss (%), yolk color, Haugh unit, USDA grade, pH of egg yolk and egg white and Fourier transform infrared (FTIR) spectrums at 0, 1, 4, 8, 12, 16, 20, 24, and 29 days. Microbial analysis for *Salmonella* was checked at 0 and 29 days of storage. Weight loss (%) and pH of egg white and yolk increased whereas Haugh unit and USDA grade decreased at 29th day. Yolk color in room storage RCE increased significantly ($p < 0.05$) from 12 to 14, in refrigeration storage RCE were not changed significantly ($p > 0.05$) and higher weight loss (%) observed in eggs stored at room temperature than refrigerated storage eggs. However, RCE stored at room temperature Haugh unit decreased significantly ($p < 0.05$) than refrigerated stored RCE and USDA grade significantly decreased ($p < 0.05$) room storage RCE with no significant decrease in refrigerated storage condition. Albumin pH and yolk pH significantly increased ($p < 0.05$) in both storage condition. *Salmonella* was not observed in RCE. FTIR spectrums indicated changes occurred in bonds of Amide A (3304 cm^{-1}), Amide I (1637 cm^{-1}), Amide II (1547 cm^{-1}), Amide III (1238 cm^{-1}), Amide IV (594 cm^{-1}), Asymmetric CH_3 Stretching (2925 cm^{-1}) and Symmetric CH_2 Stretching (3304 cm^{-1}) in room storage condition. But no chemical changes shown in egg albumin of refrigerated RCE. Moreover, secondary structural changes were detected in protein in RCE albumin during the storage. In conclusion, RCE stored at refrigerated storage showed less physiochemical changes in weight loss, Haugh unit, albumin pH, yolk pH and chemical structures during the storage period upto 29 days than room temperature.