Evaluation of Physiochemical Changes in Raw Chicken Eggs Stored at Room Temperature

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Chicken eggs are widely used in the world, due to perishability which undergoes deterioration with the time. This affects with egg processing industry and to economic losses. In this study, physiochemical changes of raw chicken eggs (RCE) stored at room temperature (28-31 °C) were determined. A total of 60 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 significantly increased ($p < 0.05$) from 12 to 14 and weight loss (%) increased ($p < 0.05$) from 0 to 6.27 with the storage time. However, Haugh unit showed a significant decrease ($p < 0.05$) from 85.13 to 40.33 and USDA grade significantly decreased ($p < 0.05$) from AA grade to B grade during 29 days of storage. Albumin pH and yolk pH significantly increased ($p < 0.05$) from 8.81 to 9.59 and from 5.77 to 6.43, respectively. *Salmonella* was not observed in RCE during storage at room temperature. FTIR spectrums indicated changes occurred in bonds of Amide A (3304 cm^{-1}), Amide I (1637 cin^{-1}), Amide II (1547 cm'), Amide III (1238 cm'), Amide IV (594 cm ^{l}), Asymmetric CH3 Stretching (2925 cm') and Symmetric CH_2 Stretching (3304 cm^{-1}). Moreover, secondary structural changes were detected in protein in RCE during the storage. In conclusion, RCE showed significant physiochemical changes in weight loss, Haugh unit, albumin pH, yolk pH and chemical structures during the storage period upto 29 days at room temperature.

Keywords: FTIR, Haugh unit, pH , Yolk color, USDA grade.