

ASSESSMENT OF GRADING QUALITY AND HEALTH HAZARDOUS SUBSTANCES IN CHICKEN EGG COLLECTED FROM DIFFERENT MARKETS IN DHAKA CITY

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Executive Summary

Egg quality is crucial for safety, nutritional value, and economic efficiency. This study assesses the external and internal quality of chicken eggs collected from Dhaka city, across various markets providing insights into four different market categories: Wholesale market (WM), Super shop (SS), Grocery shop (GS) and Open shop (OS). The study examined the quality of chicken eggs using 300 egg from various market areas. Egg quality were assessed both externally and internally. Results demonstrated that the significant variation was observed in egg weight among the various markets and the highest egg weight value was observed in open shop (60.39 ± 4.21) ($p < 0.05$). SS showed the maximum shape index value of eggs with a mean of (78.65 ± 4.59). Significant variations were found in cleanness and broken egg percentage among the markets ($p < 0.05$) and WS showed the highest broken egg percentage (5.55%). In internal quality, Haugh unit represented the significant variations among the various categories ($p < 0.05$) where OS showed the highest value of (72.05 ± 13.02) ($p < 0.05$). No significant differences were observed in shell weight and shell thickness of eggs among different categories ($p > 0.05$). A wide range of yolk color grade (5-15) was addressed in the eggs of all categories where the highest average value (9.82 ± 2.20) of yolk color grade was observed in WS ($p < 0.05$). Albumen index and yolk index value varied significantly among the various market categories and the highest albumen index (6.65 ± 2.39) and yolk index (36.32 ± 4.97) value were observed in OS and WS; respectively ($p < 0.05$). Haugh unit based and USDA based grading (internal egg quality grading) showed the highest value of 60.71% and 82.14%; respectively for AA (superior grade) grade found in OS category. Microbiological study showed the total viable count ranges from 1.9×10^5 to 8.5×10^5 in egg shell and 1.6×10^2 to 9.1×10^3 in egg yolk found in all market categories respectively. The concentration of heavy metals (Cr and Pb) were found to be below the detection level in egg samples among all categories. The comprehensive study provides valuable insights to the qualitative and quantitative parameters of eggs showing their ideal structure and content. And lower concentration of microbes and heavy metals in eggs shows no hazardous issue to human health.

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