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Effect of oil treatment on chicken egg quality during shelf life

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Abstract:

The main aim of the experiment was to investigate the influence of edible corn oil coating on the quality and preservation time of fresh chicken eggs during storage. A total of 256 eggs were used in the experiment, and they were categorized into four sizes (S, M, L, XL). After this, the eggs were divided into two groups: control (untreated), and treated (corn-oil coated).

Eggs were stored at room temperature for a period of four weeks. During storage, quality internal parameters were monitored, including weight loss, Haugh Unit values, albumen index, yolk index, and air cell height. The differences between the two groups became clearer over time.

The group of control eggs visibly deteriorated. Their yolk index dropped from about 0.48 to as low as 0.17–0.23, and the air cell expanded up to 10–11 mm, showing strong dehydration. In contrast, treated eggs preserved their quality much longer. The yolk index remained higher (0.43–0.48 at week 0, still 0.31–0.33 by week 4), and the air cell grew only to 7.5–8.5 mm. Weight loss was also noticeably lower in treated eggs, while control ones lost 7–11% of their initial weight by the end of the storage period. Statistical analysis confirmed that both oil coating and time significantly influenced albumen quality (Haugh Unit, $p < 0.001$).

Egg size had an impact on the quality of the eggs in the experiment, too. The medium (M) and large (L) size eggs that had been coated with oil retained their quality better, being classified as Grade A at the end of the storage time. On the other hand, small (S) and extra-large (XL) eggs showed a slightly quicker decline in quality. Nevertheless, the treated group performed better than the control group. In conclusion, the research results suggested that corn oil coating is a novel, economical, and eco-friendly approach to prolonging egg storage and reducing quality deterioration. The utilization of edible coating could serve as an effective method for minimizing egg quality loss in areas with limited refrigeration.