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Field of Work: Innovation and Animal Production Systems

Internal, external, and microbiological quality of eggs from cage-free laying hens stored at different storage times and temperatures

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The growing consumer concern for animal welfare has driven the adoption of cage-free chicken farming systems. Although more expensive, these systems are increasingly accepted in the market, with several companies committing to using only eggs from chickens raised under these conditions. Eggs are a nutritious and accessible food, but their quality is influenced by storage conditions and the age of the hens, being perishable by nature. Therefore, the objective was to evaluate the quality of eggs from laying hens raised in a cage-free system, stored under different time and temperature conditions. A total of 260 eggs from semi-heavy hens raised in a cage-free system were collected on the day of laying and transported to the Federal University of Agreste of Pernambuco (UFAPE) for evaluation. The eggs were distributed and stored at 5°C and 25°C and evaluated on days 0, 7, 14, 21, and 28 for variables related to internal and external egg quality. The total weight, yolk weight, and eggshell weight were not affected by temperature or storage time ($P>0.05$). However, refrigeration was effective in maintaining a higher albumen weight, yolk index, Haugh unit, and albumen pH ($P<0.05$). The lower albumen weight loss in refrigerated eggs was attributed to reduced water transfer to the environment and the yolk. The internal quality of the eggs was preserved by refrigeration, which delayed the deterioration of thick albumen. The yolk index and Haugh unit, which assess the height of the albumen and the yolk height/width ratio, were also higher in refrigerated eggs ($P<0.05$). Shell thickness was measured after analysis and was found to be equal in both groups. The microbiological evaluation included the count of mesophilic bacteria on the eggshell and in the egg contents. Refrigerated eggs showed a lower bacterial count on the shell and no contamination in the internal contents, while eggs stored at room temperature showed an increase in microbial count over time ($P<0.05$). These results highlight the effectiveness of refrigeration in maintaining egg quality and reducing microbial contamination, which are essential aspects of food safety. The reduced deterioration of internal egg characteristics in refrigerated eggs suggests that this practice may be crucial for prolonging the shelf life of eggs and ensuring their quality until final consumption.

Keywords: Animal welfare, Egg quality, Refrigeration

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