The Effect of Storage Conditions and Time on the Quality of Chicken Eggs

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Eggs are living things that interact with their environment. Eggshells may appear to be an impermeable layer, but gases and other chemicals are exchanged across the shell. This study investigated the effects of different environmental storage conditions on egg quality. Eggs are a valuable food source with the potential to meet the needs of a growing population, however, it is crucial that stored eggs are palatable, nutritious and safe to consumers. Samples of three similar chicken eggs were stored in each of four different environmental conditions for sixteen days. Daily measurements were taken of mass and visible external (shell colour and texture) and internal (air cell size) characteristics. The internal contents were examined on the sixteenth day and albumen, yolk, odour, pH and air cell size were compared to those of fresh eggs. Results showed that environmental conditions impacted significantly on egg quality. Quantitatively and qualitatively, eggs stored in the refrigerator showed the least deterioration, although the difference was small compared to those stored at constant room temperature. Eggs stored outside showed a range of daily mass changes, including an increase in 25% of trial days, correlating closely with rainfall occurring. Eggs stored at high temperatures showed greatest mass loss (average 14.7%). All eggs showed visual and olfactory deterioration of internal contents, but this was most pronounced in the eggs stored at high temperatures. Given eggshell permeability, it is crucial that eggs are stored in clean, dry, constant low-temperature environments to ensure they remain safe and appealing to consumers.

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