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Impacts of visible light treatment on broccoli shelf life and quality parameter

Abstract:

This study investigates the impact of visible light treatments on post-harvest broccoli. Hypothesizing that green-light dominance, white-light dominance, and an equal white-green cycle positively influence quality parameters and shelf life, LED lights were utilized for three distinct photoperiodic applications. Broccoli samples stored at +4°C and 95% relative humidity for 14 days underwent statistical analyses, including ANOVA and post-hoc tests, enhancing the precision of assessments. Results indicate that green-weighted and equal-duration treatments positively affected chemical parameters, including increased chlorophyll content, elevated levels of vitamins A and C, and enhanced antioxidant activity. Light-exposed samples exhibited increased weight loss, signifying activated metabolic processes. Sensory evaluations at the 14-day mark revealed control group samples reaching the end of shelf life, while light-treated samples maintained visual appeal and sensory attributes, extending shelf life significantly. Throughout storage, control group samples displayed unfavorable trends in color parameters, contrasting with light-treated samples that exhibited resilience in color retention, emphasizing the protective role of visible light treatment. In conclusion, this research underscores the positive impact of visible light applications in preserving post-harvest broccoli quality and extending shelf life, offering practical insights for enhanced food safety during storage.

Biography

I am 24 years old and I live in Istanbul. I completed my undergraduate studies in Food Engineering at Yildiz Technical University at the age of 22 and am currently pursuing my master's degree in the same field at the same university, marking my final semester. Concurrently, I have been working as an R&D engineer at Arcelik (Beko) for 1.5 years, actively participating in projects focused on food preservation. In this role, I contribute to the development of novel technologies and patents in the field.