

Japan introduces novel iR Fresh method to retain freshness in horticulture produces

13 January 2025 | News

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A research institute in Japan has developed a technology that preserves fruit and vegetables' freshness by exposing them to near-infrared light for a mere 0.1 second. The initiative is the work of the Shikoku Research Institute, an arm of the Shikoku Electric Power Group, located in Takamatsu, Kagawa Prefecture.

This technology, called **iR Fresh**, reduces mold and spoilage, and also helps reduce food waste and pesticide usage through its use of near-infrared light. It is the first technology to be granted a patent.

Kazumasa Kakibuchi, a senior researcher in the institute's chemical and biotechnology department, said fruit and veg exposed to strong near-infrared light perceive it as a signal of impending cold and dryness. This prompts the stomata to close to prevent moisture loss and increases antioxidant activity to inhibit microbial growth. By harnessing these reactions, the technology suppresses mold and wilting in produce, preserving freshness and flavor. Kakibuchi is now focusing on the potential of iR Fresh to reduce pesticide use.

In experiments, spinach stored at 10 degrees temperature began to wilt and lose its freshness after four days without the light treatment. However, spinach treated with iR Fresh maintained its firmness and luster even after six days. In similar experiments with mandarin oranges, fruit treated with iR Fresh showed reduced weight loss and spoilage, increased sweetness, enhanced color and preserved luster. These effects were observed in nearly all types of produce, including leafy and stem vegetables such as cabbage and broccoli, and fruiting vegetables like tomatoes and strawberries.

Light exposure during cultivation was the focus of previous research, but Shikoku Research Institute's focus on post-harvest light exposure led to significant breakthroughs. Due to cost considerations and economic viability based on equipment size, this technology is mainly used in large-scale collection centers and sorting facilities nationwide. Using iR Fresh before packaging helps reduce food waste and extend shelf life. In the future, the institute plans to develop household portable devices.