

# New packaging advances prolongs veggie freshness

May 16 2016

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Eva Almenar with MSU's School of Packaging, has discovered new advances in packaging that can help produce stay fresh longer. Credit: Photo by G.L. Kohuth

New advances in packaging at Michigan State University can help produce stay fresh longer.

Eva Almenar, with MSU's School of Packaging, focused on onions, one of the highest-volume vegetables sold worldwide. Her team's results, featured in a recent issue of *International Journal of Food Microbiology*, show that improvements can enhance the safety and improve the quality of the ubiquitous vegetable.

"We focused on ready-to-use onions, which have grown to become one of the five most commonly sold vegetables in the last decade," said Almenar, who also is an MSU AgBioResearch scientist. "We've found a package and sanitizer combination that led to diced onions being acceptable for purchase after two weeks of storage."

Typically, preprepared onions have short shelf lives. Once packaged, they quickly turn color, go soft, lose nutrients and flavor, and become translucent. Microorganisms also thrive as onions decompose, and pathogens, such as salmonella, can cause severe problems.

Controlling the package's atmosphere and sanitizing vegetables are not new techniques. However, finding the optimum combination of existing methods has never been tested. To that end, the scientists conducted the most-extensive evaluation of techniques that has ever been conducted.

The best packages were ones that helped maintain an atmosphere of elevated carbon dioxide and reduced oxygen. When combined with a sanitizing treatment of sodium hypochlorite, which is a common bleaching agent, onions could endure two weeks in a package yet still satisfy a panel of trained consumers.

"Of all the variations that we tested, this one reduced microbial growth, respiration and discoloration, and preserved the desired aroma," Almenar said. "Packaging vegetables is hard, but that is why I like it - the difficulty!"

This technique won't solely benefit [onions](#), either. It will provide insights into other packaging advances for many vegetables, she added.

Already, Almenar is conducting research on gas composition packaging and containers made from renewable resources and others from egg whites and whey protein isolate, byproducts from the egg and cheese food industry, respectively. These practical advances—many that go directly to market—are part of the reason for the School of Packaging's top ranking by U.S. News & World Report.

"We produce the materials, fill and sell the packages, and run all of the testing here; it's like being a partner with industry," Almenar said. "We take into consideration the conditions in the supply chain in which the product will be exposed, and we build packages to endure those conditions. There's so much science to make it all work, I truly enjoy the challenge of it all."

Additional MSU scientists contributing to this study include Natalie Page, Elliott Ryser and Janice Harte. Jaime Gonzalez-Buesa, with the University of Zaragoza (Spain), also was part of this study.

Provided by Michigan State University

Citation: New packaging advances prolongs veggie freshness (2016, May 16) retrieved 26 April 2024 from <https://phys.org/news/2016-05-packaging-advances-prolongs-veggie-freshness.html>

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