

# Asparagus benefits from X-ray treatment

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As consumer demand for convenient, nutritious foods increases, pre-cut and packaged fruit and vegetables become more popular. Food producers are looking to science to discover new ways to safely extend the shelf life of these "minimally processed" products. A potential solution to vegetables' short market life may be the lie in x-ray irradiation, the latest ionizing irradiation technology currently in use in commercial food operations.

Fresh green [asparagus](#) is one of the most popular minimally processed vegetables in the [United States](#). High in fiber and [essential nutrients](#), asparagus appears seasonally in markets across the U.S. A very limited [shelf life](#), due in part to the vegetable's high respiration rate—the speed at which the plant takes in oxygen, breaks down starches and sugars, and releases carbon dioxide—makes packing and storing asparagus especially challenging. Other factors, such as asparagus' tendency toward rapid moisture loss and its susceptibility to bacteria invasion, create additional concerns for producers.

Researcher Joongmin Shin from the University of Wisconsin–Stout, along with colleagues Bruce Harte, Janice Harte, and Kirk Dolan from Michigan State University, premiered a study in *HortScience* that gives vegetable and fruit producers new information about the use of x-ray technology to help extend the shelf life of fresh asparagus. Investigating the effect of low-dose x-ray irradiation treatment, the team found that the method significantly reduced aerobic bacteria and mold/yeast populations and helped to maintain sugar (glucose and fructose) levels in asparagus.

For the study, fresh-cut asparagus grown in Peru was sorted, cut, washed, immersed in sanitizer solution, and rinsed. The asparagus was then divided into three groups: a control group, vacuum skin-packaged (VSP) group, and vacuum skin-packaged plus x-ray irradiation (I-VSP) group. Asparagus in the I-VSP group were irradiated using a low-energy x-ray food irradiator. During a 24 day period the researchers measured headspace gas content, microbial growth, water soluble sugar content, and enzyme activity in all groups of asparagus.

"Irradiation treatment reduced aerobic bacteria (TPC) and mold/yeast populations significantly and helped to maintain sugar (glucose and fructose levels) in asparagus. In the study, irradiation temporarily increased PAL activity", said author Joongmin Shin. "We determined that that x-ray treatment will enhance consumer safety by decreasing the number of viable microorganisms on asparagus".

The report noted that additional studies are needed to evaluate any nutritional or sensory changes to asparagus before commercial feasibility of the x-ray technology can be determined.

**More information:** The complete study and abstract are available on the ASHS *HortScience* electronic journal web site:

[hortsci.ashspublications.org/content/abstract/46/1/64](http://hortsci.ashspublications.org/content/abstract/46/1/64)

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