

Antimicrobial coating reduces irradiation time, study finds

Food irradiation is now part of everyday life

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Plastic coated with a antimicrobial agent used along with irradiation can reduce pathogens in packaged ready-to-eat vegetables, a scientist claims.

Jaejoon Han, a Texas A&M University researcher, studied how packing vegetables in plastic bags coated with a natural antimicrobial agent and then processed under electronic beam irradiation can reduce foodborne pathogens. He found that the treated packaging allowed the pathogens to be killed using a smaller dose of irradiation.

Irradiation is the process of exposing food to a carefully controlled amount of energy in the form of high-speed particles or rays as a means of killing pathogens.

As a process that requires a high-energy input, any method that reduces the time required for the process can result in savings for manufacturers.

Han is not revealing the name of the antimicrobial agent he tested, but both it and the plastic packaging have been approved by the US Food and Drug Administration for use with foods, according to a Texas A&M press release.

"My research started from ready-to-eat vegetables ... from minimally processed vegetables," Han stated.

Such vegetables, including pre-packaged greens for salads, have a short shelf life and are most often eaten straight from the package without the need for cooking. That means they are a prime place for foodborne pathogens – such as listeria and E.coli – to grow. Han said he wanted to determine ways to prevent foodborne illnesses by killing the pathogens before they could contaminate foods. For the study he used romaine lettuce, a common target of pathogens.

"Our research group worked with the electronic beam irradiation," he said. "It's (a form of) non-thermal food processing so it would not alter the quality attributes of the lettuce. We also combined irradiation treatment with packaging material I devised." He coated the packaging material of ordinary plastic wrap with a natural antimicrobial agent.

Han measured the quality, such as texture and color, and chemical aspects of the lettuce to make it remain safe. Although more research is needed, Han's research has laid the groundwork for other studies, said Elena Castell-Perez, a professor of food engineering at Texas A&M. Castell was committee chair of Han's research.

"Hopefully by getting his research out, it will help educate other people about the (scientifically based) benefits of electron beam irradiation technology," she said.

About 76 million cases of food illnesses occur in the US every year, according to the Centers for Disease Control and Prevention. Although some cases are serious enough to require hospitalization or even cause death, most cases are mild.

In 2004 the 25 EU countries reported a total of 6,860 outbreaks of zoonoses, with 42,447 people affected.

"The information submitted on antimicrobial resistance in zoonotic bacteria indicated that animals and food of animal origin might serve as reservoirs for resistant bacteria with the risk of direct or indirect transfer of resistant bacteria to humans," the Commission found.

By far the most frequently reported zoonotic diseases in humans are salmonellosis and campylobacteriosis, with the most deadly being listeriosis, the report found.

There were 192,703 reported cases of salmonellosis and 183,961 of campylobacteriosis cases reported during 2004 in the EU's 25 member states. The totals have increased for 2004 due to the expansion of the EU to include 10 new member states.

The incidence of salmonellosis represent 42.2 cases per 100,000 population, which represents an increase of 22 per cent when compared with 2003, indicating the higher levels encountered in the new states.