

OZONE MAY STOP BACTERIA ON PRODUCE BETTER THAN FOOD IRRADIATION AND CURRENT WASHING METHODS, SAYS UF EXPERT

May 2, 2002

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GAINESVILLE, Fla. ---Ozone, the gas that protects the Earth from ultraviolet radiation, may soon give U.S. food shoppers better protection from harmful bacteria.

Retailers could sanitize fruits and vegetables by exposing them to ozone before they go on sale, said Gary Rodrick, a professor with the University of Florida's Institute of Food and Agricultural Sciences. In Europe, ozone has been used for decades to sanitize water and food products.

"With a 99.9 percent kill rate, it's far more effective than current sanitizing methods, such as commercial fruit and vegetable washes," Rodrick said. "The Food and Drug Administration recently gave the go-ahead to use it commercially in U.S. supermarkets and food-processing facilities. It also will be more acceptable than food irradiation, which has raised fears among some consumers."

Rodrick, a food science and human nutrition specialist, said ozone used in food sanitation will not contribute to air pollution or smog.

"In the upper atmosphere ozone shields the Earth from ultraviolet radiation. In some urban areas, ozone forms at ground level when certain airborne chemicals interact with the sun's light and heat, contributing to smog. However, the sanitation process uses very low levels of ozone, and the entire process must be precisely controlled to be effective," he said.

Ozone molecules contain three oxygen atoms and are formed when ordinary oxygen molecules containing two atoms are forced to take on a third. He said ozone's usefulness as a sanitizing agent comes from its unstable molecular structure - the third oxygen atom tends to break apart from the ozone molecule, releasing energy.

"When you expose an apple to ozone, bacteria on the fruit's surface will begin absorbing ozone molecules immediately," Rodrick said. "Those molecules break apart within seconds, and when they do the bacteria literally explode. The only waste product created is harmless oxygen, and it's unlikely that bacteria could overcome this technology by mutating into a resistant strain."

For the past year, Rodrick has tested a commercial ozone sanitizing system developed by Fresh Food Technology in Burley, Idaho. Designed for use with fruits and vegetables, the system washes the items in ozone-enriched water.

"We tested the system in supermarket produce departments, working with Publix Super Markets here in Florida," he said. "Ozone killed almost 100 percent of the bacteria on produce received from suppliers. In slightly higher concentrations it also killed yeasts and molds."

Rodrick said ozone sanitization increases the shelf life of fresh produce by up to two weeks. It also retards softening and browning, something he plans to study more this summer.

"Ozone works even better than we expected, and I think it will gain wide acceptance with U.S. consumers in the next few years," he said. "Post-harvest treatments of ready-to-eat produce are of paramount importance for preventing spoilage and minimizing the chance of food-borne infection. It's important that supermarkets do what they can to provide additional safeguards."

Currently, many supermarkets wash produce by soaking it in water mixed with a small amount of a commercial fruit and vegetable wash, Rodrick said. The produce is then rinsed in pure water before being placed on sale.

"That method has been adequate, but the effectiveness varies due to human error," he said. "You have to be mindful of the amount of wash used and the amount of produce involved. Ideally, you want a foolproof way to get uniform results."

The system developed by Fresh Food Technology is designed to prevent operator error and requires little training, said Tom Gillette, president of the company. Known as the Ozofresh 5000, the computerized system will be available commercially nationwide this month. He said price of the equipment will vary depending on the usage and needs of the customer.

"It's operated using touch screens, so all you have to do is make a few decisions and tap your finger," Gillette said. "Other than that, the only effort involved is loading and unloading the chamber."

The system is about the size of a washing machine and can sanitize 40 pounds of produce in five to eight minutes, depending on the item.

Bob Boggs, director of sales for the firm, said the technology has "enormous potential" because it's convenient and easy to use. "Small, self-contained ozone sanitizing units could be placed in supermarkets, restaurants, hospitals, schools and other facilities where large amounts of produce are prepared for use," he said.

Meats and deli items could benefit from the process, although they would probably require slightly different treatments, he said. Hard-to-

clean food processing equipment also can be sanitized with ozone.

"The technology can also be used to treat fresh seafood," Boggs said. "We can reduce odor and extend the shelf life of fish filets up to two days. When you're dealing with products retailing for \$10 to \$12 per pound, that can be a big advantage."

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By Tom Nordlie

Sources: Gary Rodrick (352) 392-1991, ext. 310, ger@gnv.ifas.ufl.edu

Tom Gillette (866) 825-8765 tgtom@earthlink.net

Bob Boggs (800) 245-5518, vpboggs@earthlink.net

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