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**Researchers Find New Use for Ozone**


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**Expert Guide**

*posted Tuesday March 26, 2002*

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Scientists at the North Carolina State University Seafood Laboratory have found a new use for ozone — enhancing the freshness of seafood.

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**Image Gallery**

In a study supported by the North Carolina Fishery Resource Grant Program (FRG), scientists found that ozone reduces the population of common spoilage bacteria in seafood processing facilities. FRG is funded by the North Carolina General Assembly and administered by North Carolina Sea Grant. The researchers worked with Peter Mairs of Hanover Sea Products in Wilmington.

"We found that treating raw fish as well as processing equipment with ozone greatly reduced the number of bacteria that can potentially spoil seafood," says Barry Nash, North Carolina Sea Grant seafood technology and marketing specialist.

Researchers demonstrated the potential effectiveness of ozone as a broad-use, sanitizing agent in a seafood production facility, says Nash. "This is important because bacteria are everywhere in the environment," he adds. "However, the use of ozone could greatly reduce the number of spoilage bacteria in a seafood plant and help maintain the low levels of spoilage bacteria over time in air, water and on processing equipment."

During the study, researchers also found that ozone seemed to improve the shelf life of uncooked fish.

"Ozone extended the shelf life of our treated fish by one or two days," says Barbara Blakistone, one of the project's investigators and a Virginia packaging consultant. "That is important when dealing with fresh fish. Ozone could help enhance product quality and lengthen the shelf life of fish so that seafood lasts longer in the retail or wholesale distribution chain."

What's more, ozone did not alter the appearance, color or aroma of the fresh fish, says Nash. "So the sensory characteristics of the treated fish were not affected," he adds.

There also were environmental benefits from treating the air and water with ozone.

"Ozone is immediately lethal to bacteria," says Nash. "Our quality results showed that ozone caused a marked and sustained decrease in air- and water-borne bacteria. This has important implications for minimizing bacterial cross-contamination in the workplace environment.

"If the population of spoilage bacteria in a plant can be reduced quickly and maintained at low levels on both seafood and processing equipment, the ultimate benefit to processors could be an extension in shelf life for a highly perishable food product such as fresh fish."

Robb Mairs, general manager of Hanover Sea Products, finds the results promising for seafood dealers.

"By extending the shelf life, we can reduce the amount of fish we lose to normal spoilage," says Mairs. "This will result in increased profitability in the seafood processing industry."

For nearly 100 years, Europeans have used ozone to disinfect their public water systems. Some cities in the United State also sanitize their public water with ozone.

In this country, ozone was approved to treat bottled water in the early 1990s. Because research has shown that ozone does not form or leave harmful chemical residues when it is applied to food or food contact surfaces, the Food and Drug Administration extended the use of ozone last year for direct contact with many food products.

Blakistone says that further ozone studies are needed. "The next step could be to incorporate ozone in ice that is used to pack fresh fish," she adds. "Ozonated ice is a concept that was scientifically evaluated on salmon during the 1980s. While the results of our research should encourage seafood processors to examine the benefits of cleaning fish with ozonated water, future projects should address the shelf life advantages for storing and distributing raw fish in ozonated ice."

For more information, contact [Barry Nash](#), 252/222-6337.