Photo by Laura Dobson

Extending shelf life

Processors try to increase safety, shelf life with dips, sprays and ozonated water

By Lauren Kramer

Shelf life is a pivotal concern for all companies handling a perishable commodity like seafood. Processors constantly grapple with handling and shipping seafood products as fast and as safely as possible so that their customers have a quality product to sell. They know that the shelf-life clock begins ticking as soon as seafood leaves the water, and every step along the supply chain can affect a product's safety, taste and appearance.

Some processors preserve seafood's shelf life by doing their best to manage the product's time and temperature and avoid using secondary treatments at all costs. Others embrace an array of new products that have debuted over the past five years, among them sprays, dips and ozonated water generators. These products promise to increase sanitation on the processing line, thus extending product shelf life, while decreasing the presence of Listeria and other pathogens that can often plague wet environs.

Frank Costanzo, plant manager at Service Smoked Fish in Brooklyn, N.Y., believes that, for the most part, chemicals are an unwelcome addition to seafood products. "Nobody wants to read a long list of chemicals on the ingredient listing of their food in general," says Costanzo. "Most of us don't want to say 'my compliments to the chemist.'"

The one exception Costanzo makes is for Keeper, an antimicrobial rinse designed specifically for the seafood industry and manufactured by Bio-Cide International of Norman, Okla.

"If there's a silver bullet for Listeria, this is it," declares Costanzo. Service Smoked Fish produces a full line of hot- and cold-smoked seafood and distributes it to bagel shops, delis, restaurants and caterers, and has been using Keeper for two years. "When you're using this stuff, you do not get positives for Listeria. Keeper has a long-term kill and then it evaporates, turning into water vapor and table salt. It's the only product I know of with Food and Drug Administration approval that can be applied directly to a ready-to-eat product with no rinsing required."

Keeper is based on acidified sodium chlorite, which generates chlorine dioxide, an antimicrobial with the efficacy to kill pathogens. At this point, it becomes table salt and presents no hazard to the seafood product it touches.

Raw seafood can be sprayed with Keeper, or dipped into a solution containing the product. Alternatively, Keeper can be used in water to create the ice that seafood is processed or stored on. It retails for $24 to $32 per gallon, and each gallon creates 400 gallons of rinse.

"On average, Keeper extends the life of frozen seafood by 30 days, increasing its shelf life by 10 to 20 percent," says Scott Owen, director of technical affairs at Bio-Cide. "Fresh seafood doesn't have a long shelf life, so adding even a day will make a big difference, but specifically how much of a shelf life extension you get depends on the product."

Another product promising to extend shelf life is Pacific Blue Seafood Spray, which claims to reduce seafood spoilage by up to 30 percent. Manufactured by Tasker Capital Corp. in Danbury, Conn., this antibacterial treatment uses Tasker's patented pHarlo technology and has been on the market since May 2006.

"The major ingredients are ammonia sulphate, sulphuric acid and copper sulphate," says Richard Falcone, president and CEO of Tasker. "Its ingredients are all recognized as safe by the FDA. Moreover, depending on what stage the seafood is at when you introduce Pacific Blue, it can double the shelf life."

Pacific Blue comes in two forms: a seafood wash that retailers use to spray or dip seafood into, and a concentrate for seafood processors to add to water lines or ice machines. Twelve bottles containing three gallons of Pacific Blue retail for $100 and a typical grocery store fish counter would require one to two bottles a day, according to Falcone.

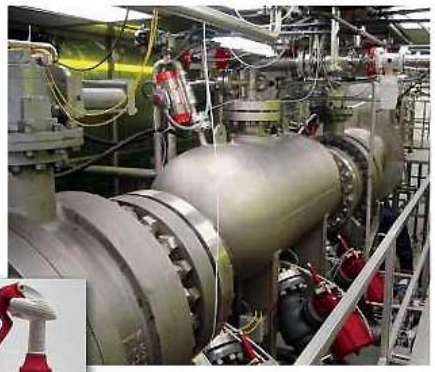
An independent toxicology study at Mississippi State University found that Pacific Blue had no negative effects on seafood, and that it also worked well as a cleaning and disinfecting agent for surfaces. "We've found Pacific Blue to be effective both as an antimicrobial that can double the shelf life of seafood, and as an agent to help decrease seafood odors," says Juan Silva, professor of food processing and safety at MSU.

For some seafood processors, the expense of dips and sprays renders their use prohibitive. "The only thing we wash our fillets with is natural salt brine, and we've had reasonably good success with it," says Roy Zaffiro, spokesman for Channel Fish Processing in Boston. "We've tried other products, but we felt that there wasn't enough value for what we were paying for those supplements."

Many processors have extended product shelf life and significantly decreased instances of Listeria and other bacteria by using ozone.

AMFIL Technologies in London, Ontario, supplies ozone-based mPact™, a cleaning antimicrobial system for food and beverage processors that uses ozonated low- and high-pressure cold water for food processing lines and processing equipment.

One of its clients, a leading Canadian fish processor, paid $30,000 for its mPact™ unit. But it also



Processes that extend shelf life range from the hi-tech iPura vessel (above) to the easy-to-use Pacific Blue Seafood Spray (at left).

reported that by using mPact™ it was able to reduce Listeria counts in its whitefish caviar by 98 percent compared to the previous year's microbial sampling data, and an increase in shelf life of two days on fresh products.

Ronnie Wrenn, president of Fresher than Fresh, a Gastonia, N.C., seafood products distributor, has used ozonated water in its processing line for the past two years, and noticed a huge difference in overall bacteria count since its introduction. "Ozone is an electrically charged oxygen gas with a half life of 20 seconds," says Wrenn. "Bacteria need oxygen to multiply, and when aerobic bacteria comes into contact with ozone, it's completely destroyed."

"We have had no complaints about our product not holding up for the 10 days we guarantee it for since we started using this system," he says.

The biggest difference we've seen is in headed and gutted fish, which are the hardest to keep clean because they still have the body cavity attached. The ozone bath knocks down the bacteria count in the body, giving us the same shelf life for headed and gutted fish as for the fillet products we pack. It's a difference like night and day."

Ray Swenton, president of Bristol Seafood in Portland, Maine, has had a similar experience since he switched from chlorine to ozonated water six years ago. "All our ice, fresh water and washing water is treated with ozone, and since we started using it, our bacteria has been reduced by almost 75 percent on all surfaces and water drainage areas," he says. "Both the shelf life of our seafood, and our sanitation in general, has been dramatically improved."

AMFIL Technologies' mPact system uses ozonated low- and high-pressure cold water for food-processing lines and processing equipment.

An ozone generator costs between $15,000 and $35,000 depending on the water flow and size of the processing plant, according to Peter Rubenstein at Pressure Techniques, which supplies generators manufactured by Clearwater Technology in California. Installation, which involves changing the water piping in the plant to ensure it is non-corrosive, can add an additional $2,000 to $10,000, while annual maintenance averages around $3,000.

Once it's all done, however, the results are well worth it, according to Swenton. "All you're really doing is paying for electricity, because it runs off electricity and water pressure," he explained. "You don't have to worry about chemicals or hazard analysis, because there's nothing hazardous about it, nor is there a residual smell, taste or odor. It's simple, easy to use and it's 99.9 percent effective."

What's more, it increases the shelf life of seafood by up to four days on a bacteria-free product, says Jerry Knecht, president of North Atlantic, also in Portland. "We run a 99 percent bacteria-free plant and product, and we've had neither Listeria nor any pathogens since we've started using ozone two-and-a-half years ago," he says.

Knecht had previously tried a few other methods to extend shelf life, including chlorine and NutraPure. "The problem with chlorine was you never knew when it was used up. The ozone costs less, and it's constantly effective," he said.

The processor also tried NutraPure, a technology developed by Gloucester, Mass.-based Proteus Industries. NutraPure is created by extracting protein from fish trimmings. Excess water is removed from the trimmings and the protein is then injected back into seafood, resulting in a shelf life increase of two to three days longer than untreated seafood, according to Stephen Kelleher, Proteus president.

North Atlantic tested it from 2005 to 2006. "We found that the industry was not ready for that application and would not pay for it, regardless of the benefits," says Knecht.

One company that takes the worry of microbial counts out of processors' hands is Global Food Technologies, with its iPura "Clean Step Process." The Los Altos, Calif., company's patented processing machine uses mechanical properties such as pressure, vacuum and temperature together with an environmentally safe, organic antimicrobial to reduce bacteria on seafood products.

"We provide the equipment, clean room, antimicrobial solutions, technology and personnel," says Robert Clark, director of marketing at GFT. "The seafood enters a vessel that changes PH, temperature and most importantly, pressure. Several minutes later, the seafood is packaged and then shipped, with a microbial count thousands of times lower than existing processes — all natural. The taste, color, texture and nutritional value are not affected and less pathogens at shipping means a dramatically extended shelf life."

Chilean salmon and Vietnamese shrimp are the first two iPura products that will appear on grocery store shelves internationally in the second quarter of 2007.

As the seafood shelf-life clock ticks on, it's prudent to stay abreast of new products that promise enhanced sanitation and freshness preservation. While no product can promise a completely bacteria-free environment, a few come as close as 98 and 99 percent — which means the bacteria battle has a clear winner.

Contributing Editor Lauren Kramer lives in British Columbia