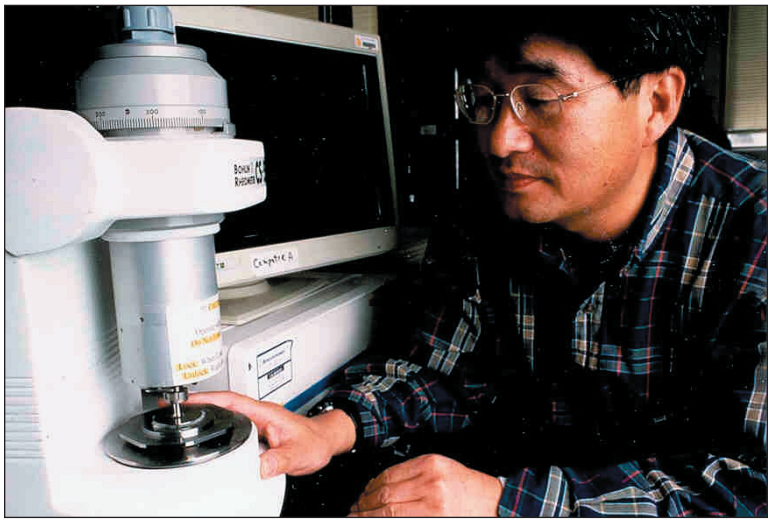
Researcher seeks ways to get more value from fewer fish

In a world where the depletion of fisheries stocks is a growing global concern, Jae Park has made a career out of finding new and improved ways to get the most out of what fish there are to be caught.

Park has been on the research faculty at Oregon State University's Seafood Lab in Astoria since 1992. In that time, he's contributed to the development of new products from underutilized species and "trash" fish, and to a growing worldwide industry based on extracting nutritious protein from fish and turning it into all manner of edible products.



Sea Grant researcher Jae Park conducts a test at the OSU Seafood Lab in Astoria, Oregon.

Along the way, he's helped train students from around the world in seafood processing and safety and sent many of them home to take on major roles in their own regions' seafood processing industries, universities, and regulatory agencies.

Park literally wrote—and edited—the book on turning minced, washed fish into a high-quality protein product known as surimi. The flavorless white paste can be made from species that are unappealing to the fresh fish market—too bony, for instance—and can be extruded, molded, colored, and flavored into a wide range of tasty products, from crab-flavored seafood to pork-flavored snack foods. Park's textbook, *Surimi and Surimi Seafood*, published by Marcel Dekker in 2000, has become the surimi industry's standard text, and a completely revised/expanded second edition is due out in March 2005.

The surimi manual emerged from one of Park's pet projects: Surimi School, an intensive, three-day workshop for surimi processors held each spring at the Astoria lab. Part hands-on instruction in the technical intricacies of surimi production, part industry summit and schmoozefest, Surimi School has been an annual event since 1992 and has spawned similar sessions in Bangkok, Paris, and Santiago, Chile.

Surimi School was always intended as a teaching and certification event for those who work in the front lines of surimi and surimi seafood processing plants. But as the event grew, Park began to notice that it attracted a growing number of industry executives and managers, eager for an opportunity to talk about the bigger picture: resource supply and demand, for instance, or the development and marketing of new products. So in 2000, Park launched the Surimi Industry Forum, held in conjunction with the school, to bring industry leaders, resource agency staff, and scientists together to talk about topics of common interest.

Surimi School is one of many projects for which Park has received support from Oregon Sea Grant, including research projects aimed at

- improving the texture of surimi gel through various chemical and mechanical processes
- investigating the use of sardines—abundant off the Oregon coast—to produce high-quality fish protein and healthful omega-3 fish oils

- exploring the use of protein left over from the surimi-making process to create a fermented fish sauce of the type that's ubiquitous in southeast Asian cuisine

Park's eyes twinkle when he talks about the fish sauce project. "That was fun," he says. "We had an idea for using an underutilized species by-product . . . to make something that could be a marketable product. Currently, all the fish sauce in this country is imported. We were able to produce something very tasty that compared favorably in taste tests with the imported product . . . . Who knows, maybe somewhere down the road I'll be in the fish sauce business."

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Park has also worked on a number of Sea Grant-funded research projects testing revolutionary methods for cooking and preserving fish: ohmic heating, electron beams, and radio frequencies. He shares a patent with several OSU colleagues on a radio-frequency heating system that cooks food faster and more efficiently than microwaves.

Even a small grant, Park says, can make the difference in getting a project off the ground. "Sometimes Sea Grant is the seed, and that allows me to pull together money from other sources to finish the project," he said. "One way or another, if I want to do it, I'll find a way to get it done."

More and more, industry is collaborating in getting it done, both as a proving ground for research projects and with more direct help. Park has forged good working relationships with the seafood processing industry—relationships that pay off in industry sponsorships for Surimi School as well as career opportunities for the graduate students who pass through Park's Astoria lab. John Lin, an executive with Pacific Surimi, earned his Ph.D. under Park's tutelage a decade ago. Now Lin is helping encourage other industry leaders to support research fellowships to benefit more students. Pacific Surimi is a current industry partner for Park's Sea Grant Industrial Fellowship.

Some of Park's former students are now teaching and doing research themselves—at West Virginia University, Suranaree University of Technology and Khon Kaen University, both in Thailand, and elsewhere—strengthening ties between the OSU program and the world.

Park himself took a research sabbatical in 2004–05, returning to his native Korea to work with research scientists in academia and industry in hopes of "recharging my thinking batteries" while building international collaboration with Korea, Thailand, and Japan.

While he enjoys working with industry abroad and at home, Park says his roots in university research are strong. "I could probably run Surimi School around the world (for industry) and do OK," he said, "but I really enjoy these research activities.

"I like the opportunities to show industry how they can do things new and better. Being in a university setting, working with programs like Sea Grant, that makes it possible to share the results broadly across the industry. And it's in the industry's interests to have these new technologies we are coming up with open to all."

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