Astoria becomes surimi capital

OSU Seafood Lab hosts annual Surimi School

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Photo courtesy of Lynn Ketchum/Oregon State University

Doctoral student Samanan Poowakanjana, left, and Surimi School founder Jae Park demonstrate a cooker used to quickly cook surimi paste and turn it into a "sausage" shaped gel.

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By EDWARD STRATTON
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Ever wondered about the crab-flavored fish protein in your seafood sandwich, crab salad or California sushi roll?

It's surimi, a fish protein paste made into various shellfish-flavored products.

Oregon State University's Seafood Lab on Marine Drive hosted the 20th annual Surimi School, a gathering of global industry

on the globally popular, gelatinous fish protein you've likely had in one form or another.

About 40 students from surimi plants, surimi seafood (finished product) plants and others from accessory industries attended lectures and took part in surimi labs.

Jae Park, an OSU professor seen as the pre-eminent expert on surimi, founded the OSU Surimi Technology School in 1993 in Astoria. He started similar institutes in Bangkok in 1996 and in Paris in 1999.

"The academic and industry languages are different," said Park. "With that mentality, I found there was a great need to build industry-academia partnerships."

His answer has been to bring in academic and industry experts from around the world to Astoria every May for the last 20 years, sharing knowledge between the two groups and enhancing everyone's understanding of

"In the school, the curriculum stays 70 percent the same," said Park, who started the annual Surimi Industry Forum in 2001.

The forum kicked off this year's school after a previous day of golf, said Park. The main focus of the daylong event was health, safety and nutrition.

Healthy discussion

Representatives of seafood and environmental groups such as the National Oceanic and Atmospheric Administration and the West Coast Seafood Processors Association offered an update on surimi production, health and potential for improvement. A panel of industry representatives from at least four continents and 10 countries also discussed resource and supply on the global market.

Growth in the United States' surimi production occurred mostly in the 1980s, after which it relatively flattened out with a peak around 2003, said Park. Since 1990, the domination of U.S. and Japanese surimi producers (more than 75 percent of the market) has dwindled. Meanwhile, China and Vietnam accounted for more than 40 percent of all surimi produced, as of 2010,

although, Park said, the fish catch in southeast Asia has been decreasing.

"We need to revisit our thermal processing without jeopardizing food safety," said Park. "We talked about the sodium issue. Salt's important, but we need to reduce the amounts used."

The largest fish source for surimi production is the Alaskan Pollock, which Park estimated accounted for 1.365 million metric tons in 2011, followed closest by 393,000 metric tons of Pacific Whiting-made surimi. The two species experienced dips in catches as recently as 2009, but have experienced a resurgence as of late.

Taneko Suzuki, a guest professor from Kokusai Gakuin Saitama College in Japan, spoke on the health benefits of surimi. Park said the 86-year-old teacher, who travels the world imparting her wisdom on others, credits much of her health to eating surimi.

Labs and lectures

After lectures on subjects ranging from cryoprotection (freezing) and hygiene to high-pressure processing and quality measurement of surimi, attendees of the school split of into labs on gel preparation, texture and color analysis and microbiology/sanitation, along with a chat with Park.

"Jae was my Ph.D. student in the late 1980s," said Tyre Lanier, a professor from North Carolina State University who taught Park much of what he knows about surimi.

He traveled to Astoria to speak at the school on the freezing of surimi, often immediately processed into formed and cured products such as crabsticks and other shellfish-flavored products.

He started coming in 1991, slightly before the school existed. “That’s when Pacific Whiting was being looked at for surimi,” he said.

Surimi, which comes from pulverized fish flesh mixed with such additives as salt, vegetable oil, starch, egg white and sugar, is cooked in two ways in the OSU Seafood Lab: an ohmic (electric current) cooker and a hot-water bath.

The lab doesn’t create surimi seafood products out of the surimi protein, except for some research.

“I just teach them how there are a lot of factors” in surimi quality, said Samanan Poowakanjana, a doctoral student from OSU focusing on surimi chemistry.

He said that making surimi of the proper consistency can depend on the salt content, species of fish, moisture content – his surimi is usually about 78 percent water – and the duration of the chopping process from frozen blocks of surimi paste to cooked sausage-shaped packets.

Poowakanjana showed attendees how the lab’s cooker could send an electric current through the surimi, cooking it to an internal temperature of 85 degrees Celsius in 30 seconds. With

Pacific whiting, he said it's best to turn the surimi paste into cooked gelatin within 20 to 30 minutes of taking it out of a freezer.

In another lab, Yi-Cheng Su, an assistant professor, biochemist and a safety specialist for OSU since 2001, focused on microbiology and sanitation of surimi products, mainly testing for E. coli and coliform.

"I just tell them the factors that might affect the growth of microorganisms," he said. "I tell them how we can kill microorganisms."

His students tested for the bacteria, measuring their concentration in the surimi samples. Low-temperature storage, said Su, is key to preventing microbial growth. Listeria and Clostridium botulinum (a common bacterial cause of botulism) are two bacteria that can be more common.

"These two can be found very widely in the environment," said Su. "So far, we don't have any problems with foodborne illness in surimi, because of" pasteurization.

Burgeoning industry and program

Park started the first annual Surimi School at the Red Lion Inn in Astoria with six corporate sponsors. With the growth of the school, the venue changed to the Columbia River Maritime Museum, then the Holiday Inn Express, then The Loft at the Red Building.

The 20th installment of the school boasted more then 20 corporate sponsors from around the world. The school is attented by some of the world's largest fishing companies, including Maruha Nichiro (largest in Japan) and Trident Seafoods (largest in U.S.).

Another focus of this year's school, with representatives from the largest U.S. surimi processors, was making American surimi tastier.

U.S. surimi consumption flattened out in the 1990s and late 2000s. Park said part of that has to do with how Americans eat their crab sticks.

"Sushi made a significant impact for the growth of surimi seafood," he said about the U.S. market, adding that using such preservatives as sodium nitrate could help surimi such as it does with hotdogs and other meats.

He said U.S. surimi is often cooked too much, and a non-thermal cooking process could improve the product. "We can borrow the meat industry's technology."

Park is now in South Korea, continuing his sabbatical. The OSU Seafood Lab has slowed down.

Christina Mireles DeWitt, director of the lab and a guest speaker, said next year the Surimi School hopes to be at least partially online, allowing OSU students to take part in the classes from a distance.

OSU's Surimi School will be showcased this June and July at the Smithsonian Folklife Festival in Washington, D.C. DeWitt said the lab is planning an open house to show the community all of the advanced research taking place in Astoria.