



Available Technology: Agriculture

# Premium fish fillet enriched with calcium by injecting nanoscaled fish bone and fish proteins for superior nutritional and eating quality

Globally over 75 million tons of discarded processing leftovers are generated. Fish bones are the main solid byproduct of the fillet and surimi processing industries and account for 10-15 % of fish weight (15-20 million tons globally). Calcium compounds from fish bone have been reported high, but the bioavailability of fish bone depends on the size of bone particles: the smaller the particle, the higher the bioavailability. When fish are processed into fillets or surimi (fish protein), the calcium contributed from bone is lost. Obviously nanoscaled bone will have much better bioavailability. Frozen fillet is not like fresh fillet due to tough texture caused by freezing denaturation. Injection of surimi (fish protein) should inhibit texture toughening and keep the moisture from being mobilization. Combining nanoscaled fish bone and surimi (fish protein) was thought to create superior nutritional and eating quality of frozen fish fillets.

Please Contact:  
Denis Sather  
IP & Licensing Manager  
541.737.8806  
denis.sather@oregonstate.edu  
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## TECHNOLOGY DESCRIPTION

Fish bone can be recovered and ground into nanoscale particles. This recovered fish bone can then be mixed with a surimi slurry that can be injected into fillets to increase the dietary calcium content as well as enhance fillet texture during frozen or chilled storage. The reintroduction of fish bone back into a fillet product is a novel concept for utilizing this currently discarded resource of dietary calcium.

## STATUS

A patent has been filed on this technology.

## Applications

- Seafood companies enhance fish fillet
- Grocery store frozen food
- Fast food restaurant

## Features & Benefits

- Injected nanoscale fish bone into fillets increase dietary calcium as well as reduce drip loss and cook loss of fillet
- Nanoscale fish bone used as an ingredient will improve the highly bioavailable dietary calcium of other seafood products
- Injected nanoscale fish bone plays an important role in moisture retention during frozen or chilled storage resulting in superior eating quality.



Frozen



Thawed



Cooked

## About the Principal Investigator:



### JAY W. PARK

Rheological and chemical characterization of fish proteins and their interaction with functional ingredients and/or physicochemical components from surimi production to utilization including pasteurization. A number of grants and gifts from private industry (surimi, surimi seafood, and ingredients) enabled me to conduct these studies. Jay W. Park

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