

## **Title: Valorisation of Catfish Bone-Derived Calcium for Novel Edible Bead Production**

### **Presenting Author Details:**

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### **Abstract:**

Catfish head is considered as waste from catfish production, while it has a potential for being the natural source of natural minerals. It was therefore used to prepare fish bone powder by soaking in hot alkaline to remove protein and fat. Thereafter, it has been softened by high temperature under the pressure in autoclave for 1 h. The softened bone was dried and ground to be powder. The catfish bone powder (CBP) was found to be the source of calcium (Ca) and phosphorous, which found at a Ca:P ratio of 13.75. These minerals are in the crystal form of hydroxyapatite assessed by spectroscopic techniques, including A field-emission scanning electron microscope (FE-SEM) equipped for energy dispersive spectroscopy (EDS) and X-ray diffractometry (XRD). This would be explained why low Ca solubility was thus observed at only  $0.03 \pm 0.0038\%$ . In this research, utilization of natural Ca from FBP was focused although low solubility was faced. Then, extraction of complexed Ca to be soluble Ca should be figured out in order to create functional foods as well as generate active cofactor for biological functions. Extraction using citric acid as the solvent under the assistant of microwave digestion was introduced. However, several factors affecting extraction efficiency should be taken in accounted for performing at the best condition. The conditions were optimized using response surface methodology with central composite design to evaluate the effect of extraction time, microwave power, citric acid concentration, and CBP weight. Based on a linear prediction model, the optimum condition to extract Ca from 0.4 g of CBP was at 0.1 M citric acid using microwave power of 275 W for 60 s, which provided a Ca content of 1.11 mg/mL. This Ca concentration was enough to induce gelation of alginate drops (1.0%) to form hydrobeads. This basic knowledge is used to create the innovative food product for preparing an edible bead using house holder microwave under a plenty patent no. 23033 of Thailand. In addition, the DIY kits has been developed for further implication in food industries. This might be the succussed case to create innovation using waste derived from food industries.

### **Biography:**

Bung-Orn Hemung is an Associate Professor at the School of Applied Science, Faculty of Interdisciplinary Studies, Khon Kaen University, Thailand. She earned a Ph.D. in Food Technology from Suranaree University of Technology (SUT) in 2008 through a joint program with the University of British Columbia (UBC), Canada. She was awarded a Brain Korea 21 Postdoctoral Fellowship at Chonnam National University (CNU), South Korea, in 2011. She has published articles in the field of science and technology, with a focus on fishery and meat products. Her current research interests are focused on the vaporization of food industry by-products for the development of novel food products.



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