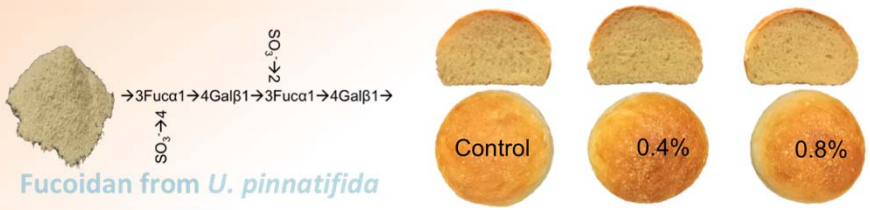
Incorporation of Fucoidan into Bread and Its Impact on Dough Development, Bread Quality, Antioxidant Activity and Anticancer Activity

By **Ms. Koh Hui Si**

Abstract

Fucoidan refers to a group of sulfated polysaccharide from brown seaweed, with bioactive properties such as antioxidant and anticancer activity. In the recent years, fucoidan has gained increased popularity among researchers as a functional ingredient. Moreover, fucoidan may have the potential to improve dough and bread quality. This work investigated the impact of fucoidan fortification (from *Undaria pinnatifida*) on dough and bread quality changes, as well as quantified the antioxidant and anticancer activities of the fortified bread after baking. Fucoidan fortification improved overall bread quality, producing bread with larger volume and softer crumb. This was attributed to the significant changes in the secondary structure of gluten upon fucoidan fortification, and an overall increase in carbon dioxide produced and retained during proofing. In terms of the bioactivities of fucoidan, it was shown that the fucoidan retained its antioxidant and anticancer activities even after baking. This study highlighted the potential of fucoidan to improve bread quality and impart antioxidant and anticancer activities.

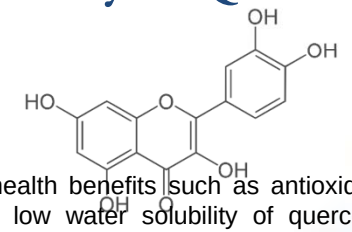


About the Speaker

Miss KOH Hui Si Audrey is a Ph.D. student in the Food Science and Technology programme at National University of Singapore, under the supervision of Prof. ZHOU Weibiao. Her works involves the characterization of fucoidan from U. pinnatifida, and to incorporate it into bread to create functional and palatable bread.

Nanocomplex of Quercetin with High-intensity Ultrasound Treated Soy Protein Isolate: Improved in Vitro Bioaccessibility of Quercetin

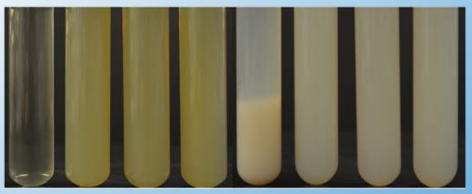
By **Ms Lin Jing**



Abstract

Quercetin is a flavonol possessing numerous health benefits such as antioxidant, anti-inflammatory and anticancer properties. The low water solubility of quercetin, however, limits its absorption in the body and restricts its application in functional food. Encapsulation of hydrophobic bioactive compounds by plant-based proteins has been used as a safe and economically viable method to improve the solubility and bioaccessibility of the bioactives. Application of ultrasound treatments on the proteins could cause their structural change favourable to encapsulation.

In this study, composite nanoparticles produced by complexation of quercetin with untreated and high-intensity ultrasound treated (20 kHz at 139 W for 10, 15 and 20 min) soy protein isolate (SPI) have been developed. Ultrasound treatments on SPI caused structural changes of proteins (e.g. around 6-fold increase of surface hydrophobicity and protein solubility) favorable to encapsulation. The encapsulation efficiency for quercetin complexed with 15 min ultrasound-treated SPI (76.5%) was around 10-fold of that with the native SPI (7.2%). The complexes of the treated SPI (15 min) and quercetin were produced at a nano-scale (136 ± 19 nm) with zeta potential of -33 ± 1 mV. Around 75% of quercetin was retained in these SPI-quercetin complexes after 60-day storage at 4°C, showing a relatively good stability of the encapsulated quercetin. Significantly enhanced in vitro bioaccessibility of quercetin was observed on the treated SPI (15 min) - quercetin nanoparticles (64.5%) as compared to the free quercetin.



About the Speaker

Ms. Jing LIN is a PhD candidate in Food Science and Technology at the National University of Singapore (NUS). She received a B.Eng degree in Food Quality and Safety from Ji Nan University in China. Her research has focused on development of food-based delivery systems for quercetin.

Host: Dr. Zhou Weibiao **Date:** 15th Oct, 2018
Time: 12 to 1 pm **Venue:** Seminar Room S16-04-30

ALL ARE WELCOME !