



The Effects of High Intensity Ultrasound on Yoghurt Starter Culture in Mono- and Co-culture at Different Initial Cell Count

By Ms Katja Krizman

M. Sc. Degree and B. Sc Degree in Food Science and Technology from Ljubljana University, Ljubljana, Slovenia obtained in 2012 (Thesis title: Influence of yeast on composition of secondary metabolites in rye sourdoughs)

SCHOLARSHIP: A*STAR-SINGA

RESEARCH WORK FOCUS: Effect of high intensity ultrasound on probiotic starter culture

Abstract

Several health benefits have been claimed to be associated with the consumption of fermented milk products. When *S.thermophilus* and *L.delbrueckii* are added into milk, the product resulting from fermentation is known as yoghurt and has become the most widely used vehicle for delivering probiotics into human body. The objective of the study was to investigate the effect of high intensity ultrasound (20 kHz) on fermentative activities and viability of yoghurt starter culture. Results showed that survival of *S.thermophilus* after sonication was greater in comparison to *L.delbrueckii*. The probiotic bacteria cells were ruptured by ultrasound and released an intracellular enzyme, β -galactosidase, which increased with higher amplitudes and prolonged treatment times. At the end of the fermentation process (pH 4.70), only yoghurts containing sonicated *L.delbrueckii* showed an increase in β -galactosidase concentration. The viability of yoghurt starter culture in the end product was comparable with or higher than that of the corresponding control when certain conditions were applied. The study also revealed that viability of *L.delbrueckii* in co-fermentation was higher only when *S.thermophilus* was sonicated. With an increase in inoculation rate, the amount of β -galactosidase in the end product also increased while viability of yoghurt starter culture was lower. The findings showed that high intensity ultrasound is a promising method when optimal conditions are used, and can be applied in mono- and co-culture fermentation.

Host: Dr Leong Lai Peng
Date: 2nd November 2015, Monday
Time: 12 pm – 1pm
Venue: Seminar Room S14-06-20



Treatment of Electrolysed Water Combined with Mild Heat on the Safety and Quality of Fresh Organic Broccoli

By Ms Liu Qin

FST PhD student; Master in Food Engineering from Shanghai Ocean University, Shanghai, China; B.Eng in Food Science and Technology from Northeast Forestry University, Harbin, China

Abstract

Organic produce utilises agricultural fertilisers for its growth thus microbial contamination is a potential concern. However, due to strict regulations, very limited chemical sanitisers and very low concentration of these sanitisers can be applied. Effects of low concentration electrolysed water (LcEW) (4 mg/L free available chlorine) combined with mild heating on natural microflora, inoculated *Escherichia coli* O157:H7 and *Listeria monocytogenes* and quality attributes of organic broccoli were investigated. When the dipping temperature of 4 mg/L EW increased from 20°C to 50°C, mesophilic aerobic bacteria, yeasts and molds were more significantly reduced from 1.12 to 2.2 log CFU/g and 0.78 to 2.32 log CFU/g, respectively. In addition, the combined treatment reduced the population of *E. coli* O157:H7 and *L. monocytogenes* by 2.14 and 2.19 log CFU/g, respectively. Moreover, EW at 50°C induced the accumulation of antioxidants of phenolic compounds more than other groups. Mildly heated EW led to decreased galacturonic acid content of chelate-soluble pectin (CSP) and sodium carbonate-soluble pectin (SSP) fractions of broccoli. By atomic force microscopy (AFM), the network structure disappeared and the height of SSP molecules decreased after mild heat treatment. SSP molecules of non-heated deionised water group were assembled into a regular self-assembly network. Effects of EW on the degradation of pectin of broccoli were similar as control group. Overall, these results suggest that the combination of LcEW and mild heat treatment is an effective approach in controlling microbial safety while not significantly affecting the quality of postharvest fresh organic broccoli.

All are welcome!