Hydrogen Sulfide (H_2S) Releasing Capacities of Commonly Consumed Organosulfur Rich Foods

By **Mr. Liang Dong**
FST PhD student; B.Eng. in in Food Science and Technology from Huazhong Agricultural University, China

Abstract

Hydrogen sulfide (H2S) is a gaseous signaling molecule with multiple biological functions in human body. Previous researches demonstrate that diallyl trisulfide (DATS) and diallyl disulfide (the major two compounds of garlic oil) can be converted into H2S in biological conditions and modulate cell signalling. In this presentation, a fluorescent probe based method for H2S releasing capacity assay in cell lines was developed. Briefly, Mcf-7 cells in 96 well plate were incubated with a H2S selective probe BCu for 3 h, then treated with potential H2S donors for 2h, which might be metabolized by the cells and produce H2S. The resulting H2S was captured by the probe and turn on the fluorescence, which was measured with a microplate reader. Linear dose response could be established between organosulfur concentration and fluorescence intensity in Mcf-7 cells, and the H2S releasing capacity of a sample was determined by comparing the slope of the regression curve with that of a DATS standard obtained in parallel. With this method, the H2S releasing capacities of 10 commonly consumed organosulfur rich foods (garlic, red onion, yellow onion, scallion, shallot, leek, spring onion, Chinese chives, durian, and stinky beans) were evaluated and ranked. Stinky beans (a vegetable from South East Asia) topped the ranking with incredible H2S releasing capacity, followed by garlic and yellow onion. Our work provides new thinking to the health benefits of organosulfur rich food.

Host: Dr. Yuk Hyun-Gyun
Date: 20th March 2015, Friday
Time: 1 to 2 pm
Venue: Seminar Room S14-06-19

Effects of High Intensity Ultrasound on One Maillard Reaction System: D-xylose-L-lysine System Model

By **Mr. Yu Hang**
FST Master Student; B. Eng., School of Food Science and Technology, Jiangnan University, China

Abstract

This seminar mainly focused on effects of high intensity ultrasound on Maillard reaction compared to thermal Maillard reaction based on one system: D-xylose-L-lysine system model. From kinetic aspects, the ultrasonic Maillard reaction had higher degradation rates of reactants and higher increase rates of A294 and A420 under relative low ambient temperatures (55 and 60°C). However, ultrasonic Maillard reaction became slower than thermal Maillard reaction when ambient temperatures increased to 65, 70 and 75°C. Overall, ultrasonic Maillard reaction had relative low Ea (i.e. 52.168 kJ mol-1 for xylose degradation) compared to thermal Maillard reaction (75.433 kJ mol-1 for xylose degradation) because of ultrasonic catalytic mechanism. GC-MS results indicated that ultrasonic Maillard reaction could produce a different flavor profile compared to thermal Maillard reaction. Three unique N-containing pyrazines (2,6-dimethyl, 3-ethyl-2,5-dimethylpyrazine and 2-methoxy-3-secbutylpyrazine), one N-containing amine (butyl amine) and two O-containing volatile compounds (ketone and pyrone) were only found in ultrasonic Maillard reaction samples. Three N-containing pyrazines (2,3-dimethylpyrazine, 2,5-dimethylpyrazine and 2,3,5-trimethylpyrazine) were selected to compare because of relative low odor threshold in water (2.5-35 ppm, 35 ppm and 9 ppm, respectively) and detectable in both ultrasonic Maillard reaction and thermal Maillard reaction. However, kinetic results indicated that final concentration of the selected volatile compounds in ultrasonic Maillard reaction became lower than thermal Maillard reaction after a long-term and relative high temperature processing. Likely reasons for this phenomenon might include degassing effect and decomposing/converting of generated volatile compounds after introducing high intensity ultrasound into system.

ALL ARE WELCOME !