

Odourant-Specific Loss of Olfactory Sensitivity with Age

By **Ms. Seow Yi Xin**

FST PhD student; B.Appl.Sc. in Chemistry
(Major in Food Science & Technology) from
NUS



Abstract

Olfactory sensitivity plays an important role in the human perception of food aromas. Decline of smell acuity with normal ageing could negatively impact the perception and hence pleasantness of foods consumed at various stages of life. Previous studies have demonstrated that ageing affects identification and discrimination abilities of odour mixtures. However, little is known on differences in the extent of loss in sensitivity towards specific odour types, or single odourants.

This study aimed to elucidate the relationship between age and olfactory sensitivity to odourants commonly found in foods. The Olfactory Performance Test was adapted and developed from a clinical olfactory diagnostic tool, the Sniffin' Sticks test, and was used to assess individual threshold and identification ability of 10 food-grade odourants from various odour groups. A total of 281 subjects, Singaporean or Singapore Permanent Residents of Chinese descent (186 women, 95 men) aged between 21 to 80 years were assessed.

Results from the study showed significant age-related decline in sensitivity towards all tested odour groups. Notably, the observed losses were specific to the odourants for both threshold and identification ability. While threshold concentration for floral odourant, phenylethyl alcohol, was 179 times higher for subjects between 71 to 80 years old than subjects aged 21 to 30 years, that of savoury odourant, 2-methyl-3-tetrahydrofuranthiol, was only slightly elevated at 3.2 times. In addition, some odourants were equally identified by subjects across all age groups, such as earthy, mushroom-like odourant 3-octen-1-ol, while minty L-menthone corresponded negatively with age.

The findings suggest that rates of loss in olfactory sensitivity are highly dependent on specific odourants. Aside from decrease over age in food aroma intensity, distortion of aroma perception may also occur in elderly citizens, and this would inevitably influence perceived pleasantness and liking. Development of foods for the elderly may therefore require compensation of non-uniform extents of loss in olfactory sensitivity with different odourants and odour groups.

Monte Carlo Simulation of Non-isothermal Degradation of Two Cyanidin-based Anthocyanins from Black Rice

By **Mr. Sui Xiaonan**

FST PhD student; M.S. and B.S. in Food Science
and Technology from Northeast Agricultural
University, Harbin, China



Abstract

Anthocyanins, a group of phenolic compounds widely found in the plant kingdom, are responsible for the orange, red, violet and blue colors observed in nature. They are harmless bioactive compounds and of easy incorporation in aqueous media, which makes them natural water-soluble colorants. From nutrition viewpoint, the significant characteristic of anthocyanins is their antioxidant activity, which plays a key role in the prevention of neuronal and cardiovascular illnesses, cancer and diabetes, among others. The antioxidant activity is due to the electron deficiency of anthocyanins and their ability to quench free radicals at the site of oxidative events.

Thermal processing as one of the most important processes has been widely adopted by nowadays food industry for enhancing food safety and quality. However, thermal processing also results in undesirable degradation of heat-sensitive compounds in foods. Current knowledge indicates that in general high temperature treatments can affect the amounts of anthocyanins in fruit and vegetable based food products. Many foods, such as fruit juice, jam and wine, which contain anthocyanins, are thermally processed prior to consumption and the thermal process can greatly influence the concentration of anthocyanin in the final products.

Determination of confidence intervals (CI) for model parameters obtained by nonlinear regression is difficult, and by far the best method to evaluate confidence intervals is via the Monte Carlo simulation method. In the present study the non-isothermal degradation of two cyanidin-based anthocyanins, cyanidin-3-glucoside and cyanidin-3-rutinoside, was investigated in aqueous system under within the temperature range from 100 °C to 165 °C, and the degradation kinetics was modeled using Monte Carlo simulation. The two anthocyanins showed different stability, with cyanidin-3-glucoside exhibiting a higher degradation rate than cyanidin-3-rutinoside. The derived degradation rate at the reference temperature of 132.5 °C and activation energy of cyanidin-3-glucoside and cyanidin-3-rutinoside were 0.0047 s⁻¹ and 0.0023 s⁻¹, and 87 kJ/mol and 104 kJ/mol, respectively.



ALL ARE WELCOME!

Host: Prof. Zhou Weibiao **Date:** 4th April 2014, Friday
Time: 12 to 1 pm **Venue:** Seminar Room S14-06-19