FST Lunchtime Seminars

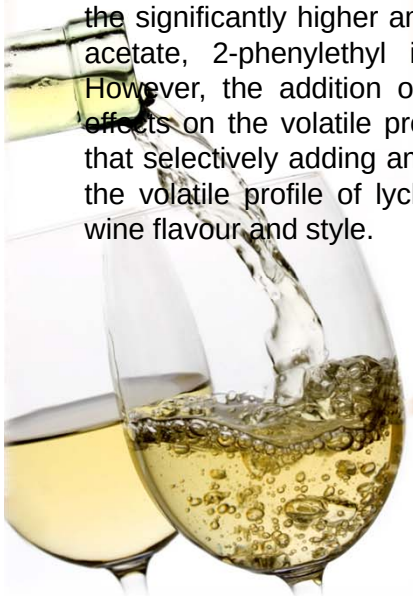
Impact of Addition of Aromatic Amino Acids on the Composition of Lychee Wine Fermented with Saccharomyces cerevisiae MERIT.ferm

By **Ms. Chen Dai**

FST PhD student; B.Eng. in Viticulture and Enology Engineering from China Agricultural University, China

Abstract

This study evaluated the effect of individual aromatic amino acid addition (L-phenylalanine, L-tryptophan and L-tyrosine) on composition of lychee wine fermented with Saccharomyces cerevisiae var. cerevisiae MERIT.ferm. Total soluble solids, pH, yeast populations, sugars, glycerol and organic acids were monitored throughout the fermentation process. Amino acids and volatiles of lychee juice and wines were analysed. The addition of amino acids did not have a significant effect on the yeast cell count, pH, soluble solid contents, sugars and ethanol. The addition of L-phenylalanine significantly reduced the production of pyruvic and succinic acids after fermentation. All of the added amino acids dramatically reduced the consumption of proline and decreased the production of glycerol. For the volatile compounds in lychee wine, the addition of L-phenylalanine resulted in the significantly higher amounts of 2-phenylethyl alcohol, 2-phenylethyl acetate, 2-phenylethyl isobutyrate and 2- phenylethyl hexanoate. However, the addition of L-tryptophan and L-tyrosine had negligible effects on the volatile profile of lychee wines. These findings suggest that selectively adding amino acids may be used as a tool to modulate the volatile profile of lychee wines so as to diversify and/or intensify wine flavour and style.



Host: Dr. Yuk Hyun-Gyun
Date: 21th March 2014, Friday
Time: 12 to 1 pm
Venue: Seminar Room S14-06-19

Environmental Stresses Alter Salmonella Enteritidis Heat/Acid Resistance, Membrane Lipid Composition and Stress/Virulence Related Gene Expression

By **Ms. Yang Yishan**

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Abstract

Salmonella Enteritidis is the most common cause of human salmonellosis reported worldwide. To inhibit or inactivate foodborne pathogens, cold storage, thermal processing, and use of antimicrobials are the most popular intervention techniques. However, foodborne pathogens might be exposed to stress conditions during inappropriate operations, which may render them greater resistance and virulence.

This study evaluated the acid and heat resistance of S. Enteritidis in simulated gastric fluid and during thermal treatments, respectively, after long-term exposure to different temperatures (10-42°C) or pHs (pH 5.3-9.0). The changes in membrane lipid composition and expression levels of rpoS and rpoH were examined to elucidate their roles in bacterial stress resistance. Transcriptional profile of several virulence-related genes was also analyzed. The results showed that heat adaption increased bacterial heat resistance; while acid-adaptation enhanced both acid and heat resistance. A decrease in the ratio of unsaturated to saturated fatty acids was observed as the growth temperature increased or pH decreased, which correlated with the enhanced heat and acid resistance. The up-regulation of rpoH in heat-adapted cells might contribute to its greater heat resistance; while the up-regulation of rpoS or/and rpoH in cells grown at low temperature or alkaline pH with increased membrane fluidity might serve as a survival strategy to cope with the adverse environment. Most of the virulence genes were up-regulated at high temperature or alkaline pH, indicating that the expression of these virulence genes highly depends on environmental conditions.

This study suggests that temperature abuse and the improper use of antimicrobials should be avoided because S. Enteritidis might adapt to the stress conditions and consequently become more resistant and virulent, resulting in an increased risk of foodborne disease.