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The use of ultrasound as an emerging technology to preserve fresh juice

Hector Eduardo Martínez-Flores
University Michoacana of Saint Nicolas Hidalgo, Mexico

Vegetable and fruit juices are universally accepted, due to their taste and fresh aspect – added to which, they are a source both of nutrients and bioactive compounds. However, the shelf life of fresh juices is short owing to the high moisture and fermentable solids content. Some products, such as carrot juice, demonstrate limited acidity. These factors contribute to microbial growth, in which case, thermal treatment is usually applied to food as a control method. Nevertheless, said treatment can reduce nutrients and affect sensory attributes. Ultrasound is a recent technology, which could be efficient in the control microbial damage and the increase of food shelf-life. Low frequency, high-intensity ultrasound waves are highly efficient in preserving foods. Said waves are associated with cavitation phenomena – explaining generation and evolution of microbubbles in a liquid medium. The result being the continued formation of microbubbles, the size of which increases a thousand-fold during alternative pressure-cycles and reaches a critical imploding size. Implosion involves the release of all the accumulated energy provoking focal increase in temperature, in turn, dissipates causing physical and chemical changes in microbial cells. Ultrasound combined with heat or pressure enhances the disruption of those cells resulting in the inactivation and/or killing of microbial cells. Ultrasound has been tested in the preservation of fruit and vegetable juices, such as: carrot, grape, cranberry, apple, pineapple, orange, watermelon and strawberry. In conclusion, ultrasound is proving to be a promising new technology with reference to its use in the preservation of fruit and vegetable juice.

hedu65@hotmail.com

Studies on layering phenomenon of tea-seed-kernel-water-slurry in fermentation process

Jinzhong Jiang, Chaoying Wang, Cuijuan Ren, Jianfang Liu and **lianzhi Wang**
Guizhou Normal College, China

Objective: Although we have successfully produced tea seed oil by fermenting (TSKWS) into three layers, the reason why TSKWS layered into three layers after fermented keeps unknown now. This study heads to expound the mechanism that TSKWS layer by fermentation.

Methods: By observing and describing the layering process of fermented TSKWS and measuring dynamic state of pH, soluble protein content, soluble polysaccharide content and dry materials content in fermented TSKWS, the layering process of fermented TSKWS were described and the reason of layering were analyzed.

Results: Fermented TSKWS layered obviously into three layers 5-6 hours after fermentation started from 0 hour. The three layers were white top layer, brown middle layer and white bottom layer. From the time point then on, relative thickness of the three layers kept basically stable till fermentation ended. In the process of layering, pH, soluble protein content, soluble polysaccharide and dry materials content in fermented TSKWS dropped gradually as time went on. Revealing the layering reason of fermented TSKWS is very meaningful to improve the production process of tea seed oil by fermentation.

jjz9911@163.com