

Sutasinee Chintong 2010: Effects of Controlled Atmosphere Storage of Pineapple and Ultrafiltration Process of Pineapple Juice on Aroma Volatile Compounds, Vitamin C Contents and Antioxidant Capacity. Master of Science (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Assistant Professor Wannee Jirapakkul, Ph.D. 129 pages.

Effects of controlled atmosphere storage of pineapple and ultrafiltration process of pineapple juice on aroma volatile compounds, vitamin C contents and antioxidant capacity were investigated. Volatile compounds were analyzed by Gas Chromatography-Mass Spectrometry (GC-MS). Vitamin C contents were examined using high performance liquid chromatography (HPLC). The antioxidant capacity was evaluated by 2,2-diphenyl-1-picrylhydrazyl radical (DPPH) and oxygen radical absorbance capacity (ORAC) methods. The results showed that the predominant aroma volatile compounds which described as pineapple aroma were 2,5-dimethyl-4-hydroxy-3(2H)-furanone, ethyl hexanoate, methyl 2-methylbutanoate, ethyl 3-(methylthio) propanoate, methyl hexanoate and methyl 3-(methylthio) propanoate. In addition, some volatile compounds with fruity aroma were ethyl 2-methylbutanoate, ethyl butanoate and ethyl 2-methylpropanoate. Controlled atmosphere (CA) storage of pineapple by using the combinations of 2% and 5% O₂ with 5% and 10% CO₂ at 12 °C could delay the alteration of predominant aroma volatile compounds, vitamin C and antioxidant capacity better than with normal atmosphere storage (p≤0.05). The optimum CA storage for pineapple was at 5% O₂ in combination with 5% or 10% CO₂. This storage could maintain the predominant aroma volatile compounds, vitamin C contents and antioxidant capacity during three weeks of storage. The quality of pineapple juice by ultrafiltration process (membrane molecular weight cut-off (MWCO) of 100 kDa) was compared with pasteurization at 96 °C 30 s. The ultrafiltration could preserve predominant aroma volatile compounds. The major compound of pineapple aroma, 2,5-dimethyl-4-hydroxy-3(2H)-furanone, was found in both permeate and retentate. However, most aroma volatile compounds remained in the retentate. Pasteurization of pineapple juice brought about the decrease in both type and concentration of aroma volatile compounds (p≤0.05). The concentration of 2,5-dimethyl-4-hydroxy-3(2H)-furanone was dramatically decreased from the fresh pineapple juice. Furthermore, ultrafiltration could reduce the loss of vitamin C and antioxidant capacity of pineapple juice. Flavor and vitamin C of mixed pineapple juice, combination of permeate with pasteurized retentate, were close to those of fresh juice.

Student's signature

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