

**STABILITY OF VITAMIN C CONTENT IN GUAVA JUICES
DURING PASTEURIZATION AND STORAGE AT
DIFFERENT CONDITIONS**

MOE SANDAR TUN

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MOE SANDAR TUN 4838011 NUFN/M

M.Sc. (FOOD AND NUTRITION FOR DEVELOPMENT)

THESIS ADVISORS: PORNRAT SINCHAIPANIT, Ph.D, ANADI NITITHAMYONG, Ph.D, RATCHANEE KONGKACHUICHAJ, Ph.D.

ABSTRACT

Guava juice is a good source of vitamin C. The vitamin C content is about 300 mg/100g of edible portion of the guava fruit. However, vitamin C in guava juice is quite degradable due to oxidation. The main factors that affect vitamin C loss are heat, light and condition of storage. Therefore, this study examined the degradation of vitamin C in guava juice following pasteurization and under different storage conditions. The changes in physico-chemical properties and sensory analysis were also considered to evaluate consumer acceptance as well as product safety. Three formulas of 30% guava juice and approximately 100% concentrations were developed based on the formula which was produced at the pilot plant of Institute of Nutrition, Mahidol University. The guava juice formulas with the highest scores of overall acceptability were selected. The optimum formula of 30% guava juice consisted of 8.4% sugar, 0.2% salt and 0.16% citric acid, approximately 100% guava juice was composed of 1.11% sugar and 0.03% salt. 30% guava juice was then selected to find an optimum pasteurization. The effects of high temperature-short time (85°C for 5, 10, 15 seconds) and low temperature-long time (65°C for 5, 20, 30 minutes) were investigated. The results showed that the optimum pasteurization was 85°C for 10 seconds, because this condition did not detect yeast and mold and also had higher vitamin C content than the others. Finally, both samples, 30% and approximately 100% concentrations, were stored under different conditions, 5°C, 10°C and room temperature for 3 weeks. The results showed that vitamin C content in 30% juice samples were significantly decreased ($p \leq 0.05$) after storage at 10°C and room temperature for 3 days. At storage at 5°C, the vitamin C loss ($p \leq 0.05$) was observed after 5 days of storage. Furthermore, the vitamin C content of 30% samples stored at 5°C and 10°C was significantly different ($p \leq 0.05$) after 10 days of storage whereas the vitamin C content of samples stored at room temperature was significantly different ($p \leq 0.05$) after 3 days of storage. Reduction of vitamin C therefore in guava juice directly related to increasing the storage temperature and time. For the degradation of vitamin C content in approximately 100% in various storage conditions, the results were the same. Degradation rate constants of vitamin C ranged between 0.029-0.179 $\text{mg l}^{-1} \text{h}^{-1}$ for 30% concentration and 0.014-0.035 $\text{mg l}^{-1} \text{h}^{-1}$ for approximately 100% guava juice, respectively. The higher degradation rate constant, the higher the degradation of vitamin C content in guava juice. Furthermore the activation energy of guava juice was 11.55 kcal/mol for 30% guava juice and 20.81 kcal/mol for approximately 100% guava juice. The lower the activation energy, the higher the loss of vitamin C. The values of pH, acidity, °Brix and salt of 30% and approximately 100% guava juices remained unchanging during the storage time under all conditions. The color value of both juice samples changed after 2 weeks. In this study, the storage condition at 5°C for 2 weeks was recommended to keep the juice. At this condition, 30% and approximately 100% guava juice providing the vitamin C content were 20.6 mg/200ml (34 % RDA) and 163.64 mg/200ml (2.7 times of RDA), respectively.

KEY WORDS: GUAVA JUICE/VITAMIN C/PASTEURIZATION/STORAGE CONDITION

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