

Sarocho Chanpen 2012: Shelf Life Extension of Lime Juice by Heat Treatments.
Master of Science (Food Science), Major Field: Food Science, Department of Food
Science and Technology. Thesis Advisor: Mrs. Sasitorn Tongchitpakdee, Ph.D.
128 pages.

Thermally processed lime juice usually has unacceptable bitter taste for consumer. The objective of this research was to study shelf life extension of lime juice by heat treatments. Thermal resistance of spoilage yeasts (*S. cerevisiae* TISTR 5110 and *P. kudriavzevii* TISTR 5147) and microbial pathogen (*Salmonella* spp.) in lime juice were also investigated. The results showed that *S. cerevisiae* TISTR 5110 (z -values = 14.27 °C) was more heat resistant than *P. kudriavzevii* TISTR 5147 (z -values = 10.40 °C), while *Samonella* spp. could not survive in lime juice. Therefore, heating time at 5D of *S. cerevisiae* TISTR 5110 was selected as pasteurization criteria of lime juice. The results showed that lime juice heated using mild heat treatment at 50 °C for 37.59 minutes (5D of *S. cerevisiae* TISTR 5110) had similar physical and chemical characteristics as well as limonin content when compared to fresh lime juice. In addition, when compared to lime juice pasteurized at 60, 70 and 80 °C for 8.51 and 1.42 minutes and 20 second, respectively (5D of *S. cerevisiae* TISTR 5110), lime juice pasteurized at 50 °C for 37.59 minutes had vitamin C content and sensory qualities (bitterness, cook odor, overall preference) most similar to fresh lime juice. Kinetic reaction study was conduct to evaluate shelf-life of lime juice pasteurized at 50 °C for 37.59 minutes by storage at 35, 45 and 55 °C for 30 days. Degradation of vitamin C (50 %) was used as a limit of shelf-life of the product. The results showed that degradation of vitamin C in lime juice followed first-order reaction, with a activation energy (E_a) of 13.8 kJ / mol. Shelf-life of lime juice pasteurized at 50 °C for 37.59 minutes stored at 4 °C predicted using equation was 1 days. In storage study, vitamin C of lime juice pasteurized at 50 °C for 37.59 minutes stored at 4 °C decreased by 50 % after storage for 6 weeks (42 days), while was no microbial growth in the sample.

Student's signature

Thesis Advisor's signature