

Abstracts

Lemon processing for commercial product was investigated. The objective of this research was emphasized to use the lemon fruit which striped lemon peel from pests and substandard raw materials for highland farmer. Lemon fruit was utilized to develop as raw material for concentrated lemon juice. Firstly, the essential oil from lemon peel was studied. It was found that, the yield percentage of essential oil was 1.53 with clear and pale yellow, hue value (43°), chroma value (0.34) and refractive index (1.11). The volatile substances of essential oil were analyzed by Gas Chromatography-Mass spectrometry (GC-MS). The results found that essential oil from lemon peel composed of 26 volatile substances which alpha limonene (63.89%) was the most volatile substance.

The debittering of lemon juice was also investigated. Three methods of debittering were compared such as blanching, using beta-cyclodextrin and enzymes. The results demonstrated that enzyme method by pectinase and naringinase were the most effective and acceptable. The chemical properties of the debited lemon juice were 6.29% citric acid, 0.01 mg/ml limonin and 0.002 mg/ml naringin content. Moreover, the sensory acceptance of color, lemon odor, sourness, bitterness and overall acceptance were 5.58, 4.60, 4.54, 4.34 and 4.52, respectively (7 point hedonic scale).

The marketing survey of lemon juice products were investigated, food additives were added in all products which 1 year of shelf-life and 57 baht (400 gram). From the consumer survey, it was found that consumers used to drink lemon juice (69.00%). The most consumers expect concentrated lemon juice products with medium sweetness and sourness (71.00 and 72.00%, respectively). All consumer (N=100) agreed that concentrated lemon juice products are sold at Royal Project shops.

The ideal ratio profile of concentrated lemon juice was also determined. The results found that the important sensory attributes of the product were color, turbidity, lemon odor, sourness, sweetness, bitterness, viscosity and overall preference. Finally, the optimal formulation of lemon juice products was lemon juice

(48.68%), fructose syrup (50.96%), salt (0.17%) citric acid (0.17%) and essential oil from lemon peel (0.02%). Moreover, the concentrated lemon juice product was pasteurized at 80 degree celsius for 25 minutes.

The physiochemical properties of developed concentrated lemon juice were determined. There are 93.92 ° (Hue value; H°), 4.08 (Chroma value; C*) and viscosity values of 14.70 cps. In addition, the quality of final product had also pH value (2.41), total soluble solids (45.10°Brix), naringin content (0.007 mg/ml) and ascorbic acid content (0.23 g/100g). The developed product was accepted by panelists with the score of 1.05 compared with ideal ratio profile of 1.00. However, total plate count, yeast and mold were less than 10 colonies per gram. Moreover, *E.coli* and *coliforms* were not detected. The 96% of consumers accepted and decided to buy concentrated lemon juice products at Royal Project shop. The production cost of developed concentration lemon juice was 48.38 baht per bottle (350 ml).

