

Development of a Coconut Water and Coconut Milk Based Beverage Incorporated with Skim Milk Powder

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Abstract

Coconut water is a colorless, slightly acidic liquid with pleasing flavor and mostly consumed for its delicious taste and nutritional value. Coconut milk is an oil-in-water emulsion extracted from the endosperm of mature coconut (*Cocos nucifera*). There are different beverages based on coconut water and coconut milk and with a high demand as a sport drink. However, its keeping quality is less than 24 hours when it exposes to air. Generally, this kind of beverages can be preserved by pasteurization. Hence, this study was conducted to develop a nutritious beverage with coconut water, coconut milk and skimmed milk powder (SMP) and to find out the best heat treatment method to prolong the shelf life. The research was conducted at Lucky Lanka Milk Processing Co. Ltd. First, the ingredient composition of the beverage was determined. Coconut milk was prepared using scraped coconut meat which blended with 100 mL distilled water. Then, 10 mL of coconut milk, sugar and skim milk were mixed with 80 mL of coconut water. Series of preliminary trials were conducted to determine the composition of the ingredients. In the final trial, the level of SMP was changed in 3-12 g range. Beverage was bottled in 200 mL glass bottles and exposed to four different heat treatments, 95 °C, 100 °C, 105 °C and 110°C for 10 minutes. Each treatment was replicated three times. The best SMP level for the beverage was selected by a sensory evaluation using 30 untrained panelists. Shelf-life analysis was done by using titratable acidity, pH and microbial evaluation for coliforms, *E. coli* and yeast and mould during storage. The total solid, moisture, protein and mineral content were analyzed in selected beverage sample. Data were analyzed using one way ANOVA (CRD) and Friedman non-parametric test in MINITAB 15. Finally, cost of production was calculated. According to the results of sensory evaluation, beverage prepared with 80 mL of coconut water, 10 mL of coconut milk and 6 g of SMP was received highest ($P < 0.05$) estimated median for overall acceptability. Heating 110 °C for 10 minutes was the best heat treatment method which extends the shelf life. Product showed pH of 5.8, TA of 0.018 lactic acid % (w/w) and 5 CFU/mL of Yeast and Mould count at 34th day of storage (4 °C). There was no growth of Coliform during the tested period. These parameters were complying with specifications for bottled coconut water given by FAO (2007). Cost of production for 210 mL of the beverage was Rs 39.32. According to the proximate analysis beverage contains 1.2% protein, 0.26 mg of potassium and 48 mg of Sodium. It can be concluded that SMP can be used to develop a beverage based on coconut water and coconut milk with good organoleptic properties and heating at 110 °C for 10 minutes can be used to extend the shelf life of the product up to 35 day under 4 °C.

Keywords: Coconut water, coconut milk, skimmed milk powder, beverage