Effects of Sugar Concentration and Acid Balancing on the Physico-chemical and Quality Characteristics of Mango (Mangifera indica) Jam

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Abstract

Mango production in Ghana is seasonal, and the fruit is highly perishable. One way of reducing their postharvest losses is to process into more stable products, like jams. The quality of jam is affected by the right balance of the fruit with other ingredients, which are sugar, pectin and acid. This study investigated the effects of sugar, pectin and acid balance on the quality characteristics of jams made from two mango varieties (Haden and Kent), using response surface methodology. A Central Composite Rotatable Design for K=3 was used to study the effect of levels of sugar (50, 75 and 100%); pectin (0%, 0.5%, 1.0%) and acid (pH 3.0, 3.25 and 3.5) on the physico-chemical properties of mango jam. Regression models were developed to predict the effect of the ingredients on some quality parameters. Sugar and acid levels significantly affected the colour as well as the total soluble solids of jam from both mango varieties. Increase pectin improved gel formation and spreadability of jam from both varieties of mango. A pectin concentration of 0.5% was considered best for improving gel formation and tenderness. A sugar concentration between 50%-75% was observed to enhance gel formation. Jams with 65% sugar, 0.5-1% pectin and pH range of 3.0-3.5 was the most preferred by sensory panelist. Kent mangoes with ingredient combination of 65% sugar, 0.5% pectin and pH of 3.25 produced jam of acceptable quality scores compared to jams from Haden mangoes.