Development of papaya milk powder and flavor additives by different drying methods

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ABSTRACT

The objects of this study were to use different methods, including hot air, spray and vacuum drying, to prepare powders of papaya milk powder. The effect of different processing conditions on the properties of the papaya milk powder was investigated in the study as well. Before drying processes, papaya juice was blanched by microwave mechanism for six minutes. Then pectinase was added into the treated papaya juice which has been incubated at 50 °C for 120 minutes. Finally, milk powder and adjunct were added into papaya juice before drying process. The temperature used for hot-air and vacuum drying were 50, 60 and 70 °C. The solid contents were controlled on 30%. Monolayer moisture contents of dehydrated products after vacuum drying and hot air drying were obtained by using the regression of BET model. The results showed that when papaya milk were treated at 60 °C, the powder was whiter, the main range was between 0.125 and 0.25 mm, solubility was higher, flowability and bulk density were 1.51 g/sec and 0.46 g/ml, but both flowability and bulk density were lower compared with other samples. However, the sensory evaluation showed that no significant difference was found among the samples treated with various conditions. The optimum drying adjunct was maltodextrin, and the combination of 20% papaya juice, 10% milk powder, and 10% maltodextrin was best formula for sensory evaluation. Before the solid contents were controlled on 30% to receive the best outlet temperature, feeding rate, drying adjunct and adjuncts. As spray drying temperature increased, bulk density, rehydration speed, moisture content and water activity were found slightly decreased, but flowability and particle diameter slightly increased. As the feeding speed increased, moisture content, water activity and particle diameter increased but no significant difference was found in other properties. As the amount of drying adjunct increased, bulk density, flowability, moisture content, water activity and particle diameter decreased, but viscosity increased. The benefit effect of color and flowability of papaya milk powder prepared with addition of sodium bisulfite and tricalcium phosphate. The bulk density, flowability and particle diameter of 20% papaya juice, 20% milk powder were decreased than 20% papaya juice, 10% milk powder, and 10% maltodextrin. The sensory evaluation showed that the combination of 20% papaya juice, 10% milk powder, and 10% maltodextrin was the best formula. The optimum conditions for the spray drying were as follows： the spray drying temperature of papaya milk was 100n4 °C, feeding rate was 2.5 ml/min, and maltodextrin, sodium bisulfite and tricalcium phosphate additives were 10%, 0.05% and 0.2%, respectively. The combination of 20% papaya juice, 10% milk powder, and 10% maltodextrin was found, the best formula for properties and sensory evaluation of papaya milk powder.

Keywords : papaya milk

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