

**Optimasi Proses Pengeringan pada Minuman Serbuk Jambu Biji Merah
Menggunakan *Response Surface Methodology* (Optimization of the Drying
Process for Red Guava Powdered Beverage Using Response Surface
Methodology)**

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ABSTRACT

Red guava is a tropical fruit with high vitamin C and lycopene content, but it is highly perishable and has a short shelf life, so it needs to be processed into powdered drink to extend its storage life. This study aimed to determine the best conditions of drying temperature, drying time, and foam thickness on the physical, chemical, and organoleptic characteristics of red guava instant powder drink. The method used was Response Surface Methodology (RSM) with a Box-Behnken Design (BBD) experimental design, assisted by Design Expert 13 software. The results showed that the selected model was significant for all responses ($p < 0.05$), with varying factor effects on each response: drying temperature significantly affected all responses, drying time significantly affected moisture content, vitamin C, a^ , b^* , and hedonic color quality, while foam thickness significantly affected L^* color and hedonic aroma quality. Numerical optimization resulted in the best condition at a drying temperature of 50°C, drying time of 5.431 hours, and foam thickness of 2 mm, with a desirability value of 0.723, yielding predicted values of 14.545% yield, 68.620% solubility, 4.720% moisture content, 42.512 mg/100 g vitamin C, 59.904 L^* , 14.251 a^* , 17.460 b^* , and hedonic quality scores of 3.812 for color, 4.069 for aroma, and 3.378 for taste. Practical verification at a drying temperature of 50°C, drying time of 5 hours, and foam thickness of 2 mm showed that nine out of ten responses fell within the 95% prediction interval, except for b^* , indicating that this condition has the potential for practical application, although the b^* model and color measurement standardization still require further refinement.*

Keywords: *Box-Behnken design, foam-mat drying, optimization, powdered beverage, red guava.*