

**COMPARITIVE STUDY ON OPTIMIZATION OF SPRAY DRYING PARAMETERS,
FOR BEETROOT JUICE POWDER USING BOX-BEHENKEN
DESIGN AND CENTRAL COMPOSITE METHOD**

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ABSTRACT

Comparison on the optimization of beetroot juice powder were done using Box-Behnken design and central composite method, to optimize the spray drying parameters of inlet air temperature (160-180), maltodextrin addition rate (5-15%), and feed flow rate (400-600 ml/h). The experimental results were done for ($p < 0.05$), fitted in the second order polynomial model, to describe and predict the responses, in terms of the powder yield, redness value and beta lain retention.

Studies done with box-benken design showed the responses as redness value and betalain retention increased with an increase in maltodextrin concentration, and the optimum conditions were found as inlet air temperature:160 deg, feed flow rate:400ml/h, maltodextrin concentration:15%. Optimization, done with central composite method showed an increase in powder yield alone, with corresponding decrease in redness value, betalain retention and the optimizing conditions were inlet air temperature:170 deg, maltodextrin concentration:10% and feed flow rate:500ml/h. Redness value, along with powder yield plays an important factor, in the optimization of spray drying parameters, hence box behnken design is the most desirable operation.

KEYWORDS: Spray Drying, Beet Root Juice, Optimization & Redness Value