

Optimization of isoflavone production from fermented soybean using response surface methodology

Abstract

This study was conducted to investigate the interaction effects among process variables during isoflavone production and optimized the yield of isoflavone. A response surface methodology (RSM) was employed to study the relationships of fermentation temperature, time, and starter culture on daidzin and daidzein as an isoflavone product. The experiments were designed using central composite by applying 2^4 factorial designs with 2 center points. Fermented soybean produced a maximum of 1,284.14 $\mu\text{g/g}$ daidzin at an optimum temperature of 29.39°C, fermentation duration at 32.06 h and starter culture content of 0.96%(w/w). Meanwhile, an optimum daidzein (1,663.85 $\mu\text{g/g}$) was obtained at 35°C and 48 h fermentation process with 0.5%(w/w) starter culture. Validation study showed the observed and predicted values were in compliance with 5% level of significance. The RSM was successful in identifying the optimum conditions for the isoflavone production.