

Optimization of cholesterol reduction conditions in homogenized milk by response surface methodology

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The present study designed to develop the optimum conditions of cholesterol reduction in 3.6% homogenized milk by response surface methodology. The effects of five different factors such as β -cyclodextrin (β -CD) concentration, stirring temperature, stirring time, stirring speed and centrifugation speed were determined by using a five level rotatable central composite design. The range of each factor was as follows: 1) β -CD concentration, 0.25% to 1.75%, 2) stirring temperature, 2.5 °C to 17.5°C, 3) stirring time, 2.5 min to 17.5 min, 4) stirring speed, 400 rpm to 800 rpm, and 5) centrifugation speed, 750 rpm to 2250 rpm. Cholesterol content was measured by saponification with ethanolic KOH following hexane extraction and gas chromatography. Based on the data, we found that the optimum conditions for the cholesterol reduction in 3.6% homogenized milk were 1.15% addition of β -CD, 17.5°C of stirring temperature, 10 min of stirring time, 800 rpm of stirring speed and 1500 rpm of centrifugation speed. In addition, the present result indicated that about 98.4% of cholesterol in milk could be removed, and β -CD may be an effective compound on cholesterol reduction process.