عنوان مقاله:

The optimization of the Extrusion conditions on Hardness of Butter using response Surface Methodology

محل انتشار:

اولین همایش ملی میان وعده های غذایی (سال: 1393)

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خلاصه مقاله:

Bulk butter was subjected to reworking by a co-rotating twin-screw extruder. Extrusion process effectively improves the work softening of butter. In the present work, the effects of extrusion conditions such as screw speed, feed rate and feed temperature on the hardness and work softening of the extruded butter were investigated. A central composite rotatable design (CCRD) was used with Three controlled variables: screw speed (50, 100, 175, 250 and 300 r/min); feed rate (20, 30, 45, 60 and 70 kg/h) and feed temperature (5, 7, 10, 13 and 15c˚). The experimental values of the work softening measured from 57.44 % to 47.11%. A second-order model was obtained to predict the work softening. It has been found that screw speed and feed rate had significant effect on work softening, which increased with increasing the experimental independent variables. Optimum processing condition generated from the models was: Hardness 14.59 (kg/cm2) and work softening 67.28 %. The predicted responses in terms of screw speed, feed rate and feed temperature were 221.48 r/min, 36.16 kg/h and 11.41 C, respectively. The predicted values registered non-significant ($p < 0.01$) difference from experimental values.

کلمات کلیدی:

butter; Extrusion; work softening; Response surface methodology

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