Optimization of Process Parameters for Corn Germ Oil Extraction

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ABSTRACT

In this study, oil extracted from corn germs was optimized using Response Surface Methodology (RSM). Effects of preheating temperature and time on the yield and oil quality were investigated.Sixteen experimental runs applying an optimal (custom) design with RSM was employed. The parameters measured were oil yield, saponification value, acid value, iodine value and peroxide value. Statistical analysis with response surface regression showed that the oil yield, acid value, iodine value and peroxide value of corn germ oil were significantly ($p<0.001$) affected with preheating temperature and time. But saponification value affected by $p<0.01$. Based on response surface, optimum conditions were preheating temperature of 110 0 C and time of 8 min. Analysis of variance indicating that the models were adequate for representing the experimental data. The treatments resulted in oil yield ranging from (38.26 to 47.30%), saponification value (209.88 to 219.70 mgKOH/g), acid value (1.12 to 1.68 mgKOH/g), iodine value (92.1 to 122.68 gIodine/100g) and peroxide value (0.6 to 2 meq/kg). Oil extracted from corn germ was successfully optimized using RSM. The regression models obtained has provided a basis for selecting optimum process variables for the recovery of oil using mechanical pressing.

Key words: *Corn germ, Heating temperature,Heating time, Oil yield, Oil quality, Optimization.*