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Czech J. Food Sci.

Jokić S., Velić D., Bilić M., Bucić-Kojić A.,

Planinic M., Tomas S.:

Modelling of solid-liquid extraction process of total polyphenols from soybeans

Czech J. Food Sci., 28 (2010): 206-212

The influence of the solvent, temperature, and extraction time on the extractability of total polyphenols from milled soybeans variety Ika was investigated. The study was performed in order to select the most suitable solvent (water; 50, 60, 70, and 80% aqueous ethanol) for achieving the highest yield of total polyphenols. The most effective solvent (50% aqueous ethanol solution) was used for monitoring the kinetics and modelling of solid-liquid extraction of total polyphenols from soybeans, average particle size 0.459 mm, at solid-liquid ratio of 20 ml/g (ratio of the solvent volume per g of raw material). The total polyphenols content in the soybean extract was determined spectrophotometrically using Folin-

Ciocalteu micro-methods at 765 nm. The applicability of different mathematical models (Peleg, Page, and Logarithmic models) to describe the kinetics of the solid-liquid extraction process of total polyphenols from soybeans was studied as well. The results exhibited a significant influence of the solvent and temperature on the kinetics and extraction yield of total polyphenols from soybeans. The best extraction yield of total polyphenols was obtained using 50% aqueous ethanol solution at 80° C after 120 min (4.322 mg GAE/g_{db}). The extraction yield of total polyphenols in soybean extracts increased by increasing the extraction temperature and extending the duration of the extraction process. The mathematical models applied showed a good agreement with the experimental results, which allows their application in modelling and optimisation of solid-liquid extraction process for the extraction of total polyphenols from soybeans.

Keywords:

solid-liquid extraction; soybeans; total polyphenols; modelling; optimisation

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