

XIV Encontro de Química dos Alimentos

Indústria, Ciência, Formação e Inovação



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CP076

Optimization of ergosterol extraction from *Agaricus blazei* Murrill using response surface methodology (RSM)

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Different approaches have been utilized to lower environmental impacts of by-products from industrial processes and this involves conversion of biological wastes, agricultural residues and waste streams into high value-added products, thereby delivering positive economic, environmental and scientific impact [1]. Mushroom production has increased recently due to their use as ingredients in preparation of nutraceutical, pharmaceutical and cosmeceutical formulations. During mushrooms sorting, an expressive volume is discarded because they do not fit into commercial standard even though their content in biomolecules is not compromised. RSM was applied to optimize the recovery of ergosterol from the fruiting bodies of *Agaricus blazei* Murrill by comparing conventional (heat-assisted extraction, HAE) and non-conventional techniques (ultrasound and microwave-assisted extractions, UAE and MAE, respectively). The used response criteria were the quantification of ergosterol by HPLC-UV and the extraction yield (%). The optimum conditions were predicted as 150 min, 81.6 °C for HAE, 30 min, 400W for UAE, and 25 min, 134.6 °C, for the MAE system. Considering both responses, MAE (25.44 mg/100 g dw, 21 %); UAE (21.49 mg/100 g dw, 11.03 %) and HAE (18.84 mg/100 g dw, 17.05 %), the MAE system was identified as the best technique followed by UAE and HAE. The values predicted by the model are in close agreement with the experimental observations, proving the validity of the model and the usefulness of the predictions for future scale up. The obtained ergosterol-rich extracts can be applied as bioactive ingredients for pharmaceutical, cosmeceutical and nutraceutical purposes.

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[1] Heleno, S.A.; Prieto, M.A.; Barros, L.; Rodrigues, A.A.; Barreiro, M.F.; Ferreira, I.C.F.R. *Food Chemistry* **2016**, *197*, 1054-1063.