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## Rapid microwave assisted extraction of lipids from a potential sustainable bioresource: The spent fowls

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Spent fowl, a high lipids containing poultry industry byproduct which have little market value, can be used as a new and sustainable biomass feed-stock, increasing the overall lipid production for several valuable purposes. This study proposed microwave extraction method to extract lipids from the spent fowl. The comparison of the microwave assisted spent fowl fatty acids profile at different extraction parameters such as temperature (60 to 100°C), extraction time (3-10 minutes), and solvent-feed ratio (mL/g) ranging from 5-15 : 1 were analysed. The extraction of lipids by Soxhlet and Folch method was also performed for comparison with the microwave extraction method. In current study, for the first time over 95% lipids were recovered using microwave irradiation within a short span of 10 minutes. Response surface methodology was used to investigate the effect of extraction conditions on the lipid extraction yield. The results obtained by statistical analysis showed that the quadratic model fits in the cases. GC-FID (Gas chromatography-flame ionization detector) spectra of the obtained spent fowl lipid predominantly revealed 43.9-46.4% oleic, 20.1-22.5% linoleic, and 21.1-23.1% palmitic acid in its composition. The compositional data were qualitatively identified and analysed with GC-FID, attenuated total reflection-Fourier transform infrared spectroscopy (ATR-FTIR), proton nuclear magnetic resonance (<sup>1</sup>HNMR), differential scanning calorimetry (DSC) and thermogravimetric analysis (TGA).

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