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Non-Halal biomarkers identification based on Fourier Transform Infrared Spectroscopy (FTIR) and Gas Chromatography-Time of Flight Mass Spectroscopy (GC-TOF MS) techniques (Conference Paper)

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Abstract

View references (19)

Consumption of meat from halal (lawful) sources is essential for Muslims. The identification of non-halal meat is one of the main issues that face consumers in meat markets, especially in non-Islamic countries. Pig is one of the non-halal sources of meat, and hence pig meat and its derivatives are forbidden for Muslims to consume. Although several studies have been conducted to identify the biomarkers for nonhalal meats like pig meat, these studies are still in their infancy stages, and as a result there is no universal biomarker which could be used for clear cut identification. The purpose of this paper is to use Fourier Transform Infrared Spectroscopy (FTIR) and Gas Chromatography-Time of Flight Mass Spectroscopy (GC-TOF MS) techniques to study fat of pig, cow, lamb and chicken to find possible biomarkers for pig fat (lard) identification. FTIR results showed that lard and chicken fat have unique peaks at wavenumbers 1159.6 cm^{-1}, 1743.4 cm^{-1}, 2853.1 cm^{-1} and 2922.5 cm^{-1} compared to lamb and beef fats which did not show peaks at these wavenumbers. On the other hand, GC/MS-TOF results showed that the concentration of 1,2,3-trimethyl-Benzene, Indane, and Undecane in lard are 250, 14.5 and 1.28 times higher than their concentrations in chicken fat, respectively, and 91.4, 2.3 and 1.24 times higher than their concentrations in cow fat, respectively. These initial results clearly indicate that there is a possibility to find biomarkers for non-halal identification. © The Authors, published by EDP Sciences, 2017.

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References (19)

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Back to results | 1 of 1

Top of page

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