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Authentication of butter from lard adulteration using high-resolution of nuclear magnetic resonance spectroscopy and high-performance liquid chromatography (Article)

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Abstract

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Food authentication is an interesting issue for all parties in the food industry, including the fats and oils industry. Some unethical players try to blend high-quality foods, such as butter, with lower ones like lard, therefore, the analytical methods capable of analyzing the adulteration practices must be developed. This study used proton nuclear magnetic resonance spectroscopy in combination with high-performance liquid chromatography for the authentication of butter from lard adulteration. The identification of triacylglycerol composition of lard as a chemical marker for halal authentication is analyzed using high-performance liquid chromatography and high resolution nuclear magnetic resonance spectroscopy. The suitability of proton nuclear magnetic resonance provides a high-performance approach for determination butter adulterated with lard in their entirety of all proton bearing components. Peaks in the region of 2.60–2.84 ppm show special characteristics only present in lard. Only lard has its own unique characteristics which only polyunsaturated fatty acids would give signals 7 at δ 2.63, that corresponded to the chemical shift of the double-allylic methylene protons. In the same way, the intensity of signal at 2.63 ppm, due to methylenic protons in a position α to two double bonds, that is to say, due to the linoleic group. Furthermore, we also correlate some signals between ^{1}H and ^{13}C-NMR spectra for the confirmation of signals. © 2017 Taylor & Francis Group, LLC.

Author keywords

Butter Halal authentication Lard NMR spectroscopy Triacylglycerol composition

Indexed keywords

Engineering controlled terms: Authentication Blending Chemical analysis Chemical bonds Chemical shift Chromatography Complexation Fatty acids Food technology Glycerol High performance liquid chromatography Liquid chromatography Liquids Magnetic resonance spectrometers Magnetic resonance spectroscopy Magnetism Nuclear magnetic resonance Oils and fats Polyunsaturated fatty acids Resonance

Compendex keywords: Butter | Food authentications | Halal authentications | Lard | Performance approach | Proton nuclear magnetic resonance | Proton nuclear magnetic resonance spectroscopy | Triacylglycerol compositions

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