

Document details

< Back to results | 1 of 1

Export

Download

Print

E-mail

Save to PDF

Add to List

More...

View at Publisher

International Journal on Advanced Science, Engineering and Information Technology Open Access  
Volume 8, Issue 4-2, 2018, Pages 1617-1624

### Profiling of wavelength biomarkers of pure meat samples from different species based on Fourier transform infrared spectroscopy (FTIR) and PCA techniques (Article)

Saputra, I.<sup>a</sup>✉, Jaswir, I.<sup>b</sup>✉, Akmeliawati, R.<sup>c</sup>✉

<sup>a</sup>Department of Biotechnology Engineering, International Islamic University Malaysia (IIUM), Malaysia  
<sup>b</sup>International Institute for Halal Research and Training (INHART), International Islamic University Malaysia (IIUM), Malaysia  
<sup>c</sup>Department of Mechatronics Engineering, International Islamic University Malaysia (IIUM), Malaysia

Abstract

View references (12)

Infrared spectroscopy (IR) has been known as an analytical method suitable for authenticity studies. In particular, Fourier transform infrared (FTIR) spectroscopy can be used for qualitative and quantitative purposes. The main advantages of FTIR are high sensitivity, high energy throughput and excellent speed of spectral acquisition. Combined with computer and advanced chemometric software, FTIR can easily be used to manipulate spectral information. Biomarkers such as DNA/RNA, proteins, metabolites, or a combination of profiles of several of these molecules are indicators that may be used to rapidly and easily detect the status and phase of biological processes. Thus biomarkers provide information about the status and phase of biological processes and their underlying particular traits. This study aims to investigate pig wavelength biomarkers against other pure samples of different types of meat based on Fourier Transform Infrared Spectroscopy (FTIR) and PCA techniques. Fat from four different animal meats (pig, chicken, beef, and lamb) were processed under different extraction conditions prior to FTIR and PCA analysis. Palm oil was used as control. Sixteen wavelengths in accordance to type of fat and processing method were identified as spectral markers to differentiate pig, beef, lamb, and chicken fats, and palm oil. The spectral biomarkers identifying pig and chicken fats were quite similar, complicating the identification of samples containing said fats. The biomarker wavelengths identified from the spectra of the four fats and palm oil at position 1236 and 3007 cm<sup>-1</sup> separated the four animal fats and palm oil at notable distances, indicating that these wavelength could be used to identify non-halal samples. © 2018, Insight Society.

SciVal Topic Prominence ⓘ

Topic: Vegetable oils | Oils and fats | edible oil

Prominence percentile: 95.800 ⓘ

Author keywords

AuthenticationBiomarkerFatFTIRHalalPCAPig

ISSN: 20885334  
Source Type: Journal  
Original language: English

Document Type: Article  
Publisher: Insight Society

NEW! SciVal Topic Prominence is now available in Scopus.

References (12)

Which Topic is this article related to? View search results format >


Metrics ⓘ

0

Citations in Scopus

0

Field-Weighted Citation Impact



PlumX Metrics

Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

Cited by 0 documents

Inform me when this document is cited in Scopus:

Set citation alert >

Set citation feed >

Related documents

Identification of pig adulterant in mixture of fat samples and selected foods based on FTIR-PCA wavelength biomarker profile

Saputra, I. , Jaswir, I. , Akmeliawati, R.  
(2018) *International Journal on Advanced Science, Engineering and Information Technology*

A bibliometric analysis on technology innovation of food authentication

Chen, Y. , Zhang, J. , Ge, Y.  
(2016) *Journal of Chinese Institute of Food Science and Technology*

Varietal Differentiation of Grape Juice Based on the Analysis of Near- and Mid-infrared Spectral Data

Cozzolino, D. , Cynkar, W. , Shah, N.  
(2012) *Food Analytical Methods*



- ☐ 1 Brangule, A., Skadiņš, I., Reinis, A., Gross, K.A., Kroča, J.  
 In vitro characterization perspectives using fourier transform infrared photoacoustic spectroscopy (FTIR PAS) and Diffuse reflectance infrared spectroscopy (DRIFT)  
 (2017) *Key Engineering Materials*, 758 KEM, pp. 273-277. Cited 3 times.  
<http://www.scientific.net/>  
 ISBN: 978-303571220-9  
 doi: 10.4028/www.scientific.net/KEM.758.273  
[View at Publisher](#)

Find more related documents in Scopus based on:

[Authors >](#)
[Keywords >](#)

- ☐ 2 Cordella, C., Moussa, I., Martel, A.-C., Sbirrazzouli, N., Lizzani-Cuvelier, L.  
 Recent developments in food characterization and adulteration detection: Technique-oriented perspectives  
 (2002) *Journal of Agricultural and Food Chemistry*, 50 (7), pp. 1751-1764. Cited 212 times.  
 doi: 10.1021/jf011096z  
[View at Publisher](#)

- ☐ 3 Cordella, C.B.Y.  
 (2012) 'PCA: The Basic Building Block of Chemometrics.' Cited 7 times.  
<http://dx.doi.org/10.5772/51429>

- ☐ 4 Constantin, C.  
 "Principal Component Analysis-A Powerful Tool in Computing Marketing Information,"  
 (2014) *Bulletin of the Transilvania University of Brasov Series V: Economic Sciences*, 7 (56).

- ☐ 5 Downey, G.  
 Food and food ingredient authentication by mid-infrared spectroscopy and chemometrics  
 (1998) *TrAC - Trends in Analytical Chemistry*, 17 (7), pp. 418-424. Cited 108 times.  
[www.elsevier.com/locate/trac](http://www.elsevier.com/locate/trac)  
 doi: 10.1016/S0165-9936(98)00042-9  
[View at Publisher](#)

- ☐ 6 Goodacre, R., Anklam, E.  
 Fourier transform infrared spectroscopy and chemometrics as a tool for the rapid detection of other vegetable fats mixed in cocoa butter  
 (2001) *JAOCS, Journal of the American Oil Chemists' Society*, 78 (10), pp. 993-1000. Cited 25 times.  
<http://www.aocs.org/press>  
 doi: 10.1007/s11746-001-0377-x  
[View at Publisher](#)

- ☐ 7 Jolliffe, I.T., Cadima, J.  
 (2016) 'Principal component analysis: a review and recent developments,'