

Document details

[Back to results](#) | 1 of 1[Export](#) | [Download](#) | [Add to List](#) | [More...](#)

ARPN Journal of Engineering and Applied Sciences

Volume 11, Issue 6, March 2016, Pages 4130-4136

[Open Access](#)**Towards authentication of beef, chicken and lard using micro near-infrared spectrometer based on support vector machine classification** (Article)Alfar, I.J.^a, Khorshidtalab, A.^a, Akmeliawati, R.^a, Ahmad, S.^a, Jaswir, I.^b^a Department of Mechatronics Engineering, Malaysia^b International Institute for Halal Research and Training International Islamic University Malaysia, Gombak, Malaysia

Abstract

[View references \(18\)](#)

NIR (near infrared) spectrometer utilized a quick reliable mean of molecular chemical detection. In this paper, we propose a method on authenticating fats originated from beef, chicken and lard. These compositions can be identified by NIR spectrometers through qualitative and quantitative analysis. Yet most of the analysis lack the capacity to find a pattern in the spectrums to be used in classification or regression models. The disadvantage of spectrum after all is the inability to show the concentration of fatty acids, yet these fatty acid components are shared by all kinds of fat/oil. Therefore, a new method is proposed to create a clear and a distinguishable pattern for the classification. The spectrum of each group (beef fat, chicken fat and pig fat "lard") of samples were acquired using a readymade micro-NIR spectrometer. The raw data required further processing before using it in the classifier. These processes including standard normal variant and Savitsky-Golay smoothing. Furthermore, the processed data was classified using support vector machine (SVM) with polynomial kernel. The trained SVM model showed 98.33% accuracy for 10-fold cross validation and 86.67% accuracy for unseen/testing data. For each individual kind of fat the model was able to identify the unseen data satisfactorily as follows lard with 100% accuracy and combined, chicken and beef showed 80% accuracy. © 2006-2016 Asian Research Publishing Network (ARPN). All rights reserved.

Author keywords

Classification; Fats/oils; Fatty acids; NIR; Spectrometer; SVM

ISSN: 18196608 Source Type: Journal Original language: English

Document Type: Article

Publisher: Asian Research Publishing Network

References (18)

[View in search results format](#) All [Export](#) | [Print](#) | [E-mail](#) | [Save to PDF](#) | [Create bibliography](#) Liebmann, B., Friedl, A., Varmuza, K.1 [Applicability of near-infrared spectroscopy for process monitoring in bioethanol production](#)(2010) *Biochemical Engineering Journal*, 52 (2-3), pp. 187-193. Cited 14 times.

doi: 10.1016/j.bej.2010.08.006

[View at Publisher](#) Rohman, A., Che Man, Y.B.2 [Analysis of Pig Derivatives for Halal Authentication Studies](#)(2012) *Food Reviews International*, 28 (1), pp. 97-112. Cited 15 times.

doi: 10.1080/87559129.2011.595862

[View at Publisher](#) Akmeliawati, R., Asyikeen, N., Jaswir, I.

3 Design and Development of Alcohol and Lard Detector in

International Seminar on Science and Technology Innovation, pp. 170-173.

2-4 Oct 2012.

Cited by 0 documents

Inform me when this document is cited in Scopus:

[Set citation alert](#)[Set citation feed](#)

Related documents

[Determination of Porcine Contamination in Laboratory Prepared dendeng Using Mitochondrial D-Loop686 and cyt b Gene Primers by Real Time Polymerase Chain Reaction](#)

Maryam, S., Sismindari, S., Raharjo, T.J.

(2016) *International Journal of Food Properties*[Support vector machine based on person VII kernel function and its application in chemical pattern classification](#)

Zheng, Q.-F., Chen, D.-Z., Liu, H.-Z.

(2007) *Fenxi Huaxue/ Chinese Journal of Analytical Chemistry*[Experiences in pattern recognition for machine olfaction](#)

Bessant, C.

(2011) *AIP Conference Proceedings*[View all related documents based on references](#)

Find more related documents in Scopus based on:

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