

## Potential of dielectric spectroscopy measurement for lard detection

### ABSTRACT

Fast and reliable techniques for detection of food adulteration are indispensable to verify food authenticity. In this study, the detection of lard against different types of animal fats based oil using dielectric spectroscopy technique subjected to middle frequency range of 100Hz - 100KHz is investigated. The animal fats were extracted and mixed with hexane solvent for different sample concentration levels. Analysis of variance (ANOVA) technique was applied to the collected data for statistical data analysis. The experimental results indicate that the dielectric value is not a function of frequencies but a function of sample's concentration levels. It is statistically shown that there is significant difference between type of animal fats with respect to their dielectric values at different frequencies and concentrations illustrating the ability of the proposed technique on lard detection objective. Furthermore, the principal component analysis (PCA) was used to classify lard and other animal fats. Results show that lard can be distinguished clearly from other animal fat sample group.

**Keyword:** Dielectric spectroscopy; Lard detection; Analysis of variance (ANOVA); Principal component analysis (PCA)