

Differentiation of lard from other animal fats based on n-alkane profiles using chemometric analysis

ABSTRACT

Adulteration of lard with other fats and oils in food production affects many areas including economics, religion, and health. Previous studies discriminated lard based on major components of fats, i.e. triglycerides and fatty acids. This study aimed to differentiate lard and other animal fats (beef, chicken and mutton fat) based on n-alkane profiles established by gas chromatography-mass spectrometry (GC-MS). Principal Component Analysis (PCA) and Hierarchical Clustering Analysis (HCA) were able to initiate clustering of lard and other animal fats. Good result was obtained using Random Forest (RF) and Partial Least Squares-Discriminant Analysis (PLS-DA). Statistical models propose tetracosane (C₂₄) as a potential n-alkane marker and it was found that C₂₄ was the major alkane with composition of 15.72% (GC-MS) of total alkanes identified. Based on this finding, more interesting study may potentially be explored for the interest of various fats and oils consumers in vast applications especially using chemometrics analysis.