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## **Determination of Palmitic Acid, Oleic Acid and Linoleic Acid by Near-Infrared Transflectance Spectroscopy in Edible Oils**

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Near-infrared (NIR) transflectance spectroscopy scanning from 1100 to 2500 nm was applied for the determination of palmitic acid ( $C_{16:0}$ ), oleic acid ( $C_{18:1}$ ) and linoleic acid ( $C_{18:2}$ ), the major fatty acids in edible oils. Edible oil samples were divided into 95 and 46 samples as a calibration and a prediction set, respectively. Regression equations (MREs) established for the calibration set between the fatty acids analyzed by gas chromatography (GC) and the NIR raw spectral data were as follows: correlation coefficients of 0.996, 0.989 and 0.993 for  $C_{16:0}$ ,  $C_{18:1}$  and  $C_{18:2}$ , respectively. The best MREs were established with the NIR raw spectral data at 2140 and 2180 nm. The Fourier transform mid-infrared spectra of

$C_{18:1}$  and  $C_{18:2}$  supported the belief that the absorptions at these w attributed to the  $CH_2$  of the straight carbon chain and the  $C=C$  of t acid. Standard errors of predictions between the data calculated fr the reference data analyzed by GC for the prediction samples wer 2.011%, and the correlation coefficients between those were large  $C_{18:1}$  and  $C_{18:2}$ , respectively. The obtained results indicate that the potentially be used as a nondestructive analysis method for the pur determination of  $C_{16:0}$ ,  $C_{18:1}$  and  $C_{18:2}$  in edible oils.

**Keywords:** [near-infrared spectroscopy](#), [nondestructive analysis](#), [f](#)

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