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Recent Advances in Edible Fats and Oils Technology

Processing, Health Implications,
Economic and Environmental Impact

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Chapter 17

Adulteration in Oils and Fats Industry



J. M. Nazrim Marikkar

Abstract Adulterations in oils and fats is a major food safety issue that affects consumers and food industries. Monitoring the purity of oils and fats has therefore become an integral part of quality assurance in industries. As the unscrupulous seeks to adopt subtle ways of adulterations, the detection of fraud becomes more difficult and challenging. A great deal of effort has been undertaken in the past to develop detection strategies using chromatographic techniques, thermal analysis techniques, spectroscopic techniques, etc. Chromatographic techniques with their wide array of column materials and detectors have emerged as the most popular authentication tools for food lipids. They can help generate data bases for compositional profiles for authentic samples of individual oils. However, compositional variations due to varietal difference and different geographic origins should be accommodated. In a number of cases, DSC thermal analysis approach has been proven to be more useful and convenient since no sample pre-treatment is required. Spectroscopic techniques such as FTIR, NIR, and FT-Raman seemed to be very useful analytical tools for detection of adulterations in general since they are rapid and can highlight subtle deviations. However, detection of adulteration using these techniques demand the application of chemometrics tool such as principal component analysis of multivariate data.

17.1 Introduction

Oils and fats form an important part of man's healthy diet. Apart from being a source of energy, they act as important structural and functional constituents of cells in biological systems. In food formulations, oils and fats contribute many desirable quality attributes such as taste, texture, structure, mouthfeel, flavour, and colour. In a competitive market-based economy, maintaining the authenticity of oils and fats in terms of their quality attributes is of paramount importance. The general quality

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