

Spectroscopic Techniques as a Tool for Quality Evaluation of Edible Oils

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In this study the performance of various spectroscopic techniques in assessing different aspects of edible oil quality was investigated and compared.

The application of various spectroscopic techniques in quality assessment of edible oils has been intensively investigated during past years. Many examples of their successful usage in studies of different properties of variety of edible oils were published. Spectroscopic studies, especially coupled with chemometric analysis, were demonstrated to provide a valuable research tool for investigating processes occurring in oils as well as a tool for routine analysis of oil quality. Nowadays spectroscopy, mainly in the near infrared region, is widely used in quality control in oil industry. However, most of published studies and applications utilize only a very limited number of spectroscopic techniques at a time.

The aim of this study was to compare capabilities of various spectroscopic techniques in evaluation of edible oil quality. The problems studied include the adulteration of olive oil with low quality oils, control of autooxidation and photo-oxidation processes in various oils, and evolution of changes in oil quality during storage. The vibrational and electronic spectroscopic techniques applied in this study include UV-Vis, NIR and MIR absorption, and UV-Vis fluorescence. The spectral properties were interpreted by means of various chemometric methods. We found that simultaneous analysis of oils using different spectroscopic techniques gives more comprehensive information, enhancing analytical and research capabilities.

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