

A Fully Automated Method to Determine Sterols by Coupled LC-GC-FID Technique

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Along with the profile of fatty acids, triglycerides and tocopherols, the sterol profile is one important parameter to assess the identity and authenticity of fats and oils. Today, many methods are used to determine the amount of total sterols and the individual distribution of the various isomers [1]. The standard methods are the ISO 12228:1999 [2] and the method described in Regulation (EEC) 2568/91. Both methods are very time-consuming and require a few hours of man-power. The aim of our development project was to fully automate these methods as well as to establish a more robust and precise method than the described standards. The project is based on the studies published by Grob et al. in the 1990's, e.g. [3].

A fully automated, robust and precise method for the analysis of sterols was established. The method is suitable for routine analysis in a commercial laboratory. Compared to the method ISO 12228, manual work was reduced by more than 95 %.

In future, the method could be extended to related parameters, e.g. methyl- and dimethylsterols or steradienes, which are also relevant parameters for the assessment of fats and oils. Finally, each application for fat and oils is imaginable if one lipid class can be separated by HPLC and can be analyzed by GC without derivatization, e.g. fatty acid alkyl esters and waxes.

References

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[3] Biedermann, M.; Grob, K.; Mariani, C. (1995): On-line LC-UV-GC-FID for the determination of Δ^7 - and $\Delta^8(14)$ -sterols and its application for the detection of adulterated olive oils. *Riv. Ital. Sostanze Grasse* 72 (8), 339-344