

High-throughput analysis of fatty acid composition of plasma glycerophospholipids

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Plasma fatty acid (FA) composition, a marker of FA status and dietary intake, is associated with health outcomes on a short- and long-term basis. Detailed investigation of the relationships between plasma FA composition and health requires the analysis of large numbers of samples, but manual sample preparation is very cumbersome and time consuming. We developed a high-throughput method for the analysis of FAs in plasma glycerophospholipids (GPs) with increased sensitivity. Sample preparation requires two simple steps: protein precipitation and subsequent base catalyzed methyl ester synthesis.

Analysis of GP FAs is performed by gas chromatography. Coefficients of variation for FAs contributing more than 1% to total FAs are below 4%. Compared with the established reference method, results of the new method show good agreement and very good correlations ($r > 0.9$). The new method reduces the manual work-load to about 10% of the reference method. Only 100 μ l plasma volume is needed, which allows for the analysis of samples from infants. The method is well suitable for application in large clinical trials and epidemiological studies.