

## Abstract

The determination of non-esterified fatty acids (NEFA) in plasma is possible by many routine biochemical methods. For more detailed metabolic studies it is required to analyse the fatty acid (FA) profile. The NEFA profile determination is usually performed by the capillary gas chromatography (GC), but the sample preparation is not uniform. NEFA may be isolated by the extraction process or by the preparative thin-layer chromatography (TLC). The aim of this study was to compare these two separation procedures.

The samples of pooled plasma from volunteer donors were analyzed by capillary GC after previous separation procedure by the TLC and the liquid-liquid extraction. The results were compared by the t-test for both the absolute concentration of individual FA provided by the internal standard (margaric acid) method and the relative abundance (Rel%).

The reproducibility of the results was significantly better for the liquid-liquid extraction method than the TLC. The relative standard deviations (RSD) of the FA groups (unsaturated, monosaturated and polysaturated) were from 4.3 to 11.3 % vs. 8.6 to 33.8 % for the relative abundance and from 16.5 to 25.5% vs. 15.4 to 47.4% for the absolute concentration. For each FA, which were represented by more than 0.1 Rel %, RSD ranged from 4.5 to 47.8% vs. 9.5 to 52.5% for the relative abundance (Rel%) and from 14.0 to 42.0% vs. 14.3 to 48.2% for the absolute concentration. The concentrations (Rel% or absolute) of the individual FA and the groups, which were isolated by both methods, were significantly different in most cases. The character of changes was same for both relative and absolute concentrations. Finding of the study is that, for the biological files analysis, it is necessary to use one of the above described methods for maintaining continuity of results.

Keywords: non-esterified fatty acids, chromatography, extraction