FATTY ACID COMPOSITION OF MATERNAL MILK FAT

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Fatty acids profile of maternal milk samples obtained from Greek women was comparatively studied. Although there have been many studies on fatty acid composition of maternal milk from many European and other continents’ countries, there is little information for the Greek population. The dietary habits, the geographical origin (within Greece) and the cultural traditions of women might affect the fatty acid composition of maternal milk.

Milk samples were collected from healthy donors, at the end of breastfeeding. GC-FID analysis of the milk total lipid\textsuperscript{[1]} revealed the presence of 45 fatty acids (FA). Saturated fatty acids constituted 38 - 49\% of the total fatty acids. Unsaturated fatty acids constituted more than 50\% of total fatty acids, with monounsaturated being three times greater than polyunsaturated fatty acids. These results are comparatively similar with the results of other European studies despite of the different dietary habits of the populations studied.

Palmitic acid (C\textsubscript{16}:0) was the main saturated fatty acid (SFA) followed by stearic acid (C\textsubscript{18}:0). The ratio between short and middle chain FA (≤C\textsubscript{14}:0) vs long chain FA (≥C\textsubscript{15}:0) varied from 0.24 to 0.45 among samples. Oleic acid (C\textsubscript{18}:1 \(\omega\)-9) contributed the most to the total concentration of MUFA. Linoleic acid (C\textsubscript{18}:2 \(\omega\)-6) was dominant among \(\omega\)-6 polyunsaturated fatty acids (PUFA). Eicosatrienoic acid (C\textsubscript{20}:3\(\omega\)-6), arachidonic acid (AA) (C\textsubscript{20}:4\(\omega\)-6) and docosatetraenoic acid (C\textsubscript{22}:4\(\omega\)-6) acids were also detected in substantial proportions. \(\omega\)-3 polyunsaturated fatty acids constituted 1.5 – 2.1\% of the total fatty acids and mainly consisted by a-linolenic (C\textsubscript{18}:3\(\omega\)-3), eicosatrienoic (C\textsubscript{20}:3\(\omega\)-3) and docosahexaenoic acid (DHA) (C\textsubscript{22}:6\(\omega\)-3) acids. Eicosapentaenoic acid (EPA) (C\textsubscript{20}:5\(\omega\)-3) and docosapentaenoic acid (DPA) (C\textsubscript{22}:5\(\omega\)-3) acids were also detected in minor proportions. The \(\omega\)-3 fatty acid proportions could consider adequate for the needs of breast-fed infants. Furthermore, long-chain polyunsaturated fatty acids (LCPUFA), and especially DHA and arachidonic acid (AA), have essential role in the development of the central nervous system, the brain and the retina of the infant\textsuperscript{[2]}.

Several lipid quality indices were compared among samples. Therefore, polyunsaturated/saturated (P/S), monounsaturated/saturated (M/S) and \(\omega\)-6/\(\omega\)-3 fatty acid ratios of milk fat showed significant variations among samples. Furthermore, atherogenic and thrombogenic indices of milk fat remained in desirable levels (≤1.0) in most samples.

The fatty acid composition of the studied milk samples was significantly affected by the donor. This result confirms that maternal milk fatty acid profile is influenced by many factors as the dietary habits, the cultural traditions of studied women.

KEYWORDS: Maternal milk; fatty acids; GC-FID analysis, lipid quality indices.

REFERENCES: