The stereospecific triacylglycerol structures and fatty acid profiles of human milk and infant formulas - DTU Orbit (09/08/2019)

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Background: The stereospecific structures of the triacylglycerol molecules in human milk differ from that of cow's milk and vegetable oils, which are the fat sources used in infant formula. In human milk, palmitic acid (16:0) is predominantly esterified in the sn2 position, whereas vegetable oils or cow's milk fat contain most of their 16:0 in the outer positions of the triacylglycerol molecules. Furthermore, human milk contains long-chain polyunsaturated fatty acids, which are not present in either cow's milk or vegetable oils. Methods: By standard lipid analysis procedures, we examined the triacylglycerol structures and fatty acid profiles of fats from 28 infant formulas or formulas for special indications available in the Danish market from 1999 to 2003. Results: The total fatty acid compositions of the formulas showed a 16:0 content almost similar to human milk, whereas the content in the sn2 position was considerably lower. The content of oleic acid was found to be equal to or higher than in human milk in 21 of 28 formulas, whereas the content in the sn2 position was higher in all but one formula. Most formulas had linoleic acid levels considerably above that of human milk. Long-chain polyunsaturated fatty acids (arachidonic acid and docosahexaenoic acid) were present in all preterm formulas, but only in 3 of the term formulas. Conclusion: We found that most of the examined infant formulas, both preterm and term as well as special formulas, had stereospecific structures and fatty acid profiles that differed considerably from that of human milk.

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