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Evolution of essential fatty acid composition of French breast milk from 1997 to 2014 Multi-year observational study on fatty acid composition of breast milk as a reflection of omega-3 consumption in France

Objectives: To assess the evolution of fatty acid composition in French breastmilk over 17 years as a marker of dietary habit modifications. Their content in human milk (HM) varies with the mother's diet.

Methods: Samples of mature HM were collected in the morning between 1- and 3-months post-partum across 3 clinical trials conducted in 1997 (n = 16), 2007 (n = 142) and 2014 (n = 80). The FA composition of HM was determined by direct transesterification and analyzed by GC-FID.

Results: The data acquired in France between 1997 and 2014 showed that the rate of ALA increased by 84% and those in LA were decreased by 25%. These changes induced a 60% decrease in the ratio LA / ALA. DHA rate improved by 13% between 2007 and 2014, whereas the ARA rate is stable. The rates of trans FAs have fallen by 50% since 1997 thanks to the modification of French margarine formulations.

Conclusions: Over 17 years, French milk lipid composition was modified, certainly due to the modification of French dietary behavior, closer to the nutritional recommendations. Indeed, we assist to an evolution of lipid consumption over the last decades in favor of rapeseed oil (three times higher in 2012 than in 2001) and of "health" margarine rich in ALA. Finally, the reduction of trans fatty acid levels (TFA) could be explained by an improvement, in France, of the composition of the margarine with a very low level of TFA. The studies

conducted since 1997 have shown a modification of the content of n-3 and n-6 of the HM, reflecting changes in feeding habits, closer to the current recommendations. In this context, it should be promoted firstly to reduce the ratio LA / ALA to 5 by the consumption of oil or margarine rich in ALA to optimize biosynthesis of ALA to DHA and secondly to provide directly the DHA rate by the consumption of fatty fish.

Speaker Biography

Claude Billeaud received his MD degree from the Medical University of Bordeaux (France) in 1979 after a graduation in human cytogenetics (1976). He then studied pediatrics and has been the Clinical Assistant Director of Bordeaux University in the departments of Pediatrics, Neonatology and Intensive Care since 1983. He currently serves as a pediatrician in the neonatal unit at the Children's Hospital of Bordeaux, as a scientific manager of Bordeaux-Marmande human milk bank, as a lecturer and head of research in neonatal nutrition at the Medical University of Bordeaux. His particular interest in research led him to graduate in Biology and Health (1988, Bordeaux), be awarded a master in statistics applied to clinical research (1991, Montreal) and complete a PhD in nutrition and food science (2000, Bordeaux). Along his career he has often been invited as a guest professor specialized in nutrition and neonatology in various universities abroad (Montreal, Corrientes in Argentina). Over the last 35 years, he has been an active member of different scientific organizations, either French, European or American, specialized in perinatal medicine (neonatology, pediatrics and nutrition). In this instance, he has served as the President of the Association for Pediatric Education in Europe (A.P.E.E) since 2008. He has also been very involved in the French human milk banking association (ADLF) for more than 10 years, sharing his academic knowledge focused in nutrition and his long clinical experience in neonatology. He is currently carrying out several researches on the composition of human milk. As an expert in nutrition and perinatal medicine, he is also the author and co-author of numerous scientific publications.

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