This review provides biochemical evidence coupled with observations from animal and human studies that aim to characterize which fatty acids are truly essential to prevent EFAD” Anez-Bustillos et al (2017).

Abstract:

The essentiality of fatty acids was determined by the Burrs in the 1920s. It is commonly accepted that provision of linoleic (LA) and alpha-linolenic acids (ALA) prevents and reverses essential fatty acid deficiency (EFAD). Development of alternative injectable lipid emulsions (ILE) low in LA and ALA has raised concern about their ability to prevent EFAD.

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This review provides biochemical evidence coupled with observations from animal and human studies that aim to characterize which fatty acids are truly essential to prevent EFAD. Retroconversion pathways and mobilization from body stores suggest that arachidonic and docosahexaenoic acids (ARA and DHA – the main derivatives of LA and ALA, respectively) also prevent EFAD. Our group first proposed the essentiality of ARA and DHA by feeding mice exclusively these fatty acids and proving that they prevent EFAD. Survival for 5 generations on this diet provides additional evidence that growth and reproductive capabilities are
maintained. Moreover, the use of fish oil-based ILE, with minimal LA and ALA and abundant DHA and ARA, for treatment of intestinal failure-associated liver disease, does not result in EFAD. These findings challenge the essentiality of LA and ALA in the presence of ARA and DHA. Evidence discussed in this review supports the idea that ARA and DHA can independently fulfill dietary essential fatty acid requirements. The imminent introduction of new ILE rich in ARA and DHA in the United States highlights the importance of understanding their essentiality, especially when provision of ALA and LA is below the established daily minimum requirement.

Reference:


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