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Abstract

The Importance of Human Milk Fatty Acids in Infant Growth and Development—Concentration vs. Relative Abundance vs. Intake †

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Abstract: Fatty acids are the building blocks of the entire human milk lipidome; yet, despite years of research, there is little understanding of their importance in early life health and disease. This may be partly due to the way in measurements have been made of fatty acids in the past. Monthly longitudinal human milk samples were collected from eighteen Western Australian mother–infant dyads, during six months of exclusive breastfeeding (n = 704). Additionally, data including monthly anthropometric measurements, health information, and basic maternal food frequency questionnaires were also collected. Infant 24 h milk intake and total lipid intake were measured at three months. Gas chromatography-mass spectrometry was used to profile human milk fatty acids. Linear regression and Pearson's correlation were used to identify associations between human milk fatty acid composition, intake, maternal characteristics, and infant outcomes. Significant variation in human milk fatty acid composition was identified between dyads, and throughout lactation. Mean infant intake for total lipids was 29.7 ± 9.4 g/day. Intake of many fatty acids, including long chain fatty acids, such as C15:0, C18:1, and C18:2, were positively associated with infant growth ($p < 0.001$). This study identified important findings for many human milk fatty acids not previously described, including C15:0 and C18:2 species. Infant total lipid intake and fatty acid intake perform essential roles in infant growth and development. This study highlights the importance of human milk sampling, analytical methods, and estimating infant intake in relation to infant outcomes. Indeed, these factors should be carefully considered in future research.

Keywords: lipids; breastfeeding; human milk; infant nutrition; omics

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