Arachidonic and docosahexaenoic acids are biosynthesized from their 18-carbon precursors in human infants

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It is becoming clear that an adequate level of lung-chain highly unsaturated fatty acids in the nervous system is required for optimal function and development; however, the ability of infants to biosynthesize long-chain fatty acids is unknown. This study explores the capacity of human infants to convert 18-carbon essential fatty acids to their elongated and desaturated forms, in vivo. A newly developed gas chromatography/negative chemical ionization/mass spectrometry method employing 2H-labeled essential fatty acids allowed assessment of this in vivo conversion with very high sensitivity and selectivity. Our results demonstrate that human infants have the capacity to convert dietary essential fatty acids administered enterally as 2H-labeled ethyl esters to their longer-chain derivatives, transport them to plasma, and incorporate them into membrane lipids. The in vivo conversion of linoleic acid (18:2n6) to arachidonic acid (20:4n6) is demonstrated in human beings. All elongases/desatu