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Title: Very long chain omega-3 (n-3) fatty acids and human health

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Abstract: Omega-3 (n-3) fatty acids are a family of polyunsaturated fatty acids that contribute to human health and well-being. Functionally the most important n-3 fatty acids appear to be eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), but roles for n-3 docosapentaenoic acid (DPA) are now emerging. Intakes of EPA and DHA are usually low, typically below recommended intakes. Increased intakes are reflected in greater incorporation into blood lipid, cell and tissue pools. Increased content of EPA and DHA modifies the structure of cell membranes and the function of membrane proteins involved as receptors, signaling proteins, transporters, and enzymes. EPA and DHA modify the production of lipid mediators and through effects on cell signaling can alter patterns of gene expression. Through these actions EPA and DHA alter cell and tissue responsiveness in a manner that seems to result in more optimal conditions for growth, development, and maintenance of health. The effects of n-3 fatty acids are evident right through the life course, meaning that there is a need for all sectors of the population to have a sufficient intake of these important nutrients. EPA and DHA have a wide range of physiological roles which are linked to certain health or clinical benefits.

Practical application: Very long chain omega-3 (n-3) fatty acids are found in seafood, especially fatty fish, and in supplements. They exert a range of health benefits as a result of their molecular, cellular and physiological actions. Consequently, very long chain n-3 fatty acids play important roles in growth, development, optimal function, and maintenance of health and well-being right across the life course. Therefore, all sectors of the population need to ensure sufficient intake of these important nutrients. This can be achieved through eating fatty fish or, failing that, use of good quality supplements.

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