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Enhanced absorption of n-3 fatty acids from emulsified compared with encapsulated fish oil.

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Abstract

Health benefits of n-3 fatty acids are well-established. However, consumption of adequate dietary sources of these fatty acids is inadequate. Oral fish oil supplements are an alternative means of consuming adequate long-chain n-3 fatty acids in individuals who do not consume sufficient dietary sources. However, palatability can present a problem with compliance. Emulsifying fish oil allows for production of a pleasant-tasting supplement and can enhance digestion and absorption of the fatty acids. We investigated the rate and extent of absorption of emulsified fish oil compared with capsular triglyceride fish oil supplements in humans. Participants subjectively rated palatability of these products. A randomized, crossover-designed, open-label trial was performed in which 10 healthy volunteers received emulsified fish oil and capsular triglyceride fish oil orally. Blood samples were collected at 0, 2, 4, 8, 24, and 48 hours to determine the absorption of individual fatty acids into plasma phospholipid fatty acids. At the completion of blood collection, subjects were asked to subjectively rate the tolerance and acceptability of the two supplements. During a 48-hour period, there was enhanced absorption of total n-3 and eicosapentaenoic acid (0.67%±0.16%, 0.45%±0.06%; P<0.01; 0.34%±0.05%, 0.23%±0.04%; P=0.05; emulsified fish oil and capsular triglyceride fish oil, respectively) observed for the emulsified fish oil treatment. Our findings indicate that a single dose of emulsified fish oil resulted in enhanced absorption of total n-3 eicosapentaenoic acid and docosahexaenoic acid as evidenced by changes in phospholipid fatty acids composition compared with the capsular triglyceride fish oil during the 48-hour observation period. Both supplements were subjectively rated and found to be well-tolerated by participants.