Abstract

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Changes in consumption of omega-3 and omega-6 fatty acids in the United States during the 20th century.

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BACKGROUND: The consumption of omega-3 (n-3) and omega-6 (n-6) essential fatty acids in Western diets is thought to have changed markedly during the 20th century.

OBJECTIVE: We sought to quantify changes in the apparent consumption of essential fatty acids in the United States from 1909 to 1999.

DESIGN: We calculated the estimated per capita consumption of food commodities and availability of essential fatty acids from 373 food commodities by using economic disappearance data for each year from 1909 to 1999. Nutrient compositions for 1909 were modeled by using current foods (1909-C) and foods produced by traditional early 20th century practices (1909-T).

RESULTS: The estimated per capita consumption of soybean oil increased >1000-fold from 1909 to 1999. The availability of linoleic acid (LA) increased from 2.79% to 7.21% of energy ($P < 0.000001$), whereas the availability of α-linolenic acid (ALA) increased from 0.39% to 0.72% of energy by using 1909-C modeling. By using 1909-T modeling, LA was 2.23% of energy, and ALA was 0.35% of energy. The ratio of LA to ALA increased from 6.4 in 1909 to 10.0 in 1999. The 1909-T but not the 1909-C data showed substantial declines in dietary availability (percentage of energy) of n-6 arachidonic acid, eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA). Predicted net effects of these dietary changes included declines in tissue n--3 highly unsaturated fatty acid status (36.81%, 1909-T; 31.28%, 1909-C; 22.95%, 1999) and declines in the estimated omega-3 index (8.28, 1909-T; 6.51, 1909-C; 3.84, 1999).

CONCLUSION: The apparent increased consumption of LA, which was primarily from soybean oil, has likely decreased tissue concentrations of EPA and DHA during the 20th century.

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