

### Letters to the Editor

## Correspondence re: Terry *et al.*, No Association between Fat and Fatty Acids Intake and Risk of Colorectal Cancer. *Cancer Epidemiol. Biomark. Prev.*, 10: 913–914, 2001

### Letter

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Terry *et al.* (1) have conducted a study to clarify promoting/suppressive effects of n-6 PUFAs<sup>2</sup> and n-3 PUFAs on the development of colorectal cancer in Sweden. The authors calculated consumption of fat and fatty acids for their cohort individuals from FFQ data, divided the intake into quartiles, and calculated RRs with the lowest quartile as the reference. However, neither increased RRs attributable to the intake of n-6 PUFAs nor reduced RRs attributable to n-3 PUFAs were detected. Furthermore, neither the n-6 PUFAs:n-3 PUFAs ratio nor that for linoleic acid:(EPA+DHA) was associated with the risk. Here, we would like to make some comments on their findings.

First, their correlation coefficients between FFQ *versus* diet records for consumption of fat and fatty acids ranged from 0.4 to 0.5 (1, 2), satisfactorily high and similar to our own data for Japanese dietitians, although the number of subjects in our study is admittedly small (3). However, the relative validity of intake of PUFAs, when compared with the composition in adipose tissue, was as low as 0.05, which implies that dietary intake of PUFAs is unrelated to the composition in colorectal membranes and may be inappropriate to elucidate any effects of PUFAs on the risk of colorectal cancer. Such a low value appears to be associated with n-6 PUFAs, major components of PUFAs that ubiquitously exist in foods, including vegetable oils. The short FFQ of Terry *et al.* with 67 food items, thus, was unlikely to have secured a high validity. There may exist some measurement error in assessing fat intake, as the authors suggested. Whatever, information on values for the comparability between intake and composition in adipose tissue for linoleic

Table 1 Daily intake of fatty acids in Swedish women and Japanese female dietitians

Fatty acid	Swedish (based on FFQ) (n = 61,463) median (g)	Japanese (based on SQFFQ) <sup>a</sup> (n = 79) median (g)
n-6 PUFAs		
Lowest quartile		7.10
Second quartile		8.66
Third quartile		11.05
Highest quartile		13.39
Linoleic acid		
Lowest quartile	3.7	6.93
Second quartile	4.9	8.53
Third quartile	6.0	10.83
Highest quartile	7.4	13.17
n-3 PUFAs		
Lowest quartile		1.67
Second quartile		2.32
Third quartile		2.75
Highest quartile		3.66
α-linolenic acid		
Lowest quartile	0.45	0.89
Second quartile	0.50	1.20
Third quartile	0.54	1.50
Highest quartile	0.70	2.04
EPA		
Lowest quartile	0.03	0.19
Second quartile	0.05	0.28
Third quartile	0.07	0.36
Highest quartile	0.09	0.49
DHA		
Lowest quartile	0.08	0.36
Second quartile	0.11	0.52
Third quartile	0.13	0.63
Highest quartile	0.18	0.87

<sup>a</sup> SQFFQ, semiquantitative FFQ.

acid and breakdown values of n-3 PUFAs would appear to be useful to the reader.

Second, daily consumption of n-3 PUFAs including α-linolenic acid, EPA, DPA, and DHA, or n-3 HUFAs (EPA + DPA + DHA) (4) seems very low in Sweden, if we assume that the measurement unit is grams. To aid discussion, a comparison of intakes of fatty acids between Swedish women and Japanese female dietitians calculated from semiquantitative FFQ is given in Table 1. The consumption of EPA and DHA in Sweden was only one-fifth of that in Japan because of the lower intake of marine foods, including fish. The low level of n-3 PUFAs (or n-3 HUFAs) appears insufficient to exert competitive inhibition against n-6 PUFAs, precursors of arachidonic acid and prostaglandin E<sub>2</sub>, which cause inflammation and tumor promotion (4–7). It is recommended to pay attention to the percentage of linoleic acid in total fat (or of energy) as well as to the ratios of

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<sup>2</sup> The abbreviations used are: PUFA, polyunsaturated fatty acid; FFQ, food frequency questionnaire; RR, relative risk; EPA, eicosapentaenoic acid; DPA, docosapentaenoic acid; DHA, docosahexaenoic acid; HUFA, highly unsaturated fatty acid.

n-6 PUFAs:n-3 PUFAs and linoleic acid:n-3 HUFAs in attempts to predict the risk of colorectal cancer.

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### Reply

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In a large prospective cohort study (1), we found no association between the intake of n-3 or n-6 fatty acids and colorectal

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cancer risk. In a comparison of fatty acid intake data from 20 countries (2), Sweden was ranked second in per capita consumption of n-3 fatty acids and the ratio of n-3:n-6. The only country with a higher estimated per capita intake was Japan, where the level of n-3 intake (and the ratio of n-3:n-6) was ~3-fold greater. Hence, rather than say that Swedes have a low intake of n-3 fatty acids, we suggest that, in general, the Japanese appear to have an exceptionally high intake, which potentially makes Japan an excellent source of information about the health effects of these fatty acids. However, it is difficult to compare the Swedish intakes in our data with the Japanese intakes in the study of Tokudome *et al.* (3) because our food frequency questionnaire was designed to rank individuals correctly, not to measure absolute intakes. In addition, the estimated validity of polyunsaturated fat intake relative to adipose tissue composition in our data was  $n = 0.5$  not  $n = 0.05$ . We thank Tokudome *et al.* (4) for pointing out that error.

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