The primary objective of this newly-released case-control study was to carefully examine associations between the dietary intakes of various fatty acid types including total and individual omega-3 fatty acids and the risk of colorectal cancer. The authors point out that a recent systematic review (Cooper et al., Brit. Med. J., 332:752-760 (2006)) which indicated that omega-3 fatty acids do not affect cancer incidence was limited from various aspects. They emphasize that most of the studies evaluated had very small numbers of cancer cases and did not distinguish between different types of cancer. The present study included a very large number of colorectal cancer cases (1455 patients) representing 45% of all cases of colorectal cancer that occurred in Scotland over the study period from 1999-2006 and an equal number (1455 cases) of matched controls. This SOCCS investigation (Study Of Colorectal Cancer in Scotland) assessed fatty acid intakes in the diet from diverse food sources using food composition tables and nutrient databases for fatty acids and their levels in various foods as consumed.

The authors observed a highly significant (statistically) dose-dependent relationship between the intake of total omega-3 fatty acids as well as selected individual omega-3 fatty acids and the risk of colorectal cancer. Higher intakes of total omega-3 (n-3) polyunsaturated fatty acids were associated with a progressively lower risk (up to 37% overall) of colorectal cancer. With respect to the corresponding relationships to the intake of individual omega-3 fatty acids, no relationship between higher intakes of ALA (alpha-linolenic acid) and colorectal cancer risk was found. However, higher intakes of EPA (up to = 442 mg/person/day) were associated with a 41%
reduction in the overall risk of colorectal cancer whereas increased intakes of DHA (≈ 587 mg/day) were associated with a significantly lower risk of colorectal cancer (by 37%). Since DHA + EPA is consumed primarily via fish (in contrast to ALA which is primarily derived from plant food sources and corresponding plant oils), the authors also evaluated the relationship between fish consumption and the risk for colorectal cancer. These results indicated that the highest total fish consumers showed a 24% lower risk for developing colorectal cancer as compared to those with the lowest intakes of fish (the lower quartile). With respect to oily fish consumption, those consuming at the highest quartile (upper 25% of the population) exhibited an approximate 34% lower risk for developing colorectal cancer relative to those in the lowest quartile (lower 25% of the population) for oily fish consumption.

**Dr. Holub's Comments:**

The authors report very strong and inverse dose-dependent associations with respect to the intake of the long-chain omega-3 fatty acids primarily from fish/fish oils (as DHA and EPA) in this very large case-control study from the Study of Colorectal Cancer in Scotland. It remains to be determined if these findings will be confirmed in corresponding large-scale studies from other countries where the intakes of DHA+EPA and fish may be at different levels and frequencies that those reported in this study from Scotland. The highest intakes of DHA (≈ 587 mg/day) and EPA (≈ 442 mg/day) which gave the lowest apparent risk for colorectal cancer would yield a combined DHA+EPA intake of approximately 1000 mg/day. Such an intake is approximately 7-times the current North American intake of approximately 140 mg/day combined of DHA/EPA. A target intake of 1000 mg/day of DHA/EPA (combined) is essentially identical to the target intakes recommended by the American Heart Association for individuals with coronary heart disease (directed towards protection against fatal heart attacks). Consuming several servings of fatty fish (approximately 7 times per week) would yield an average daily intake of DHA/EPA (combined) approaching 1000 mg/day. Fish oil supplements and DHA/EPA concentrates thereof as well as functional food containing DHA/EPA would provide additional sources of these long-chain omega-3 fatty acids.