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A LONG-TERM POPULATION STUDY OF CHOLESTEROL LOWERING BY SITOSTANOL ESTER MARGARINE

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The long-term cholesterol lowering effect of sitostanol, a 5-α saturated derivative of sitosterol solubilized in rapeseed oil margarine, was studied in a double-blind placebo-controlled random population sample (n=150) with mild hypercholesterolemia. At baseline all subjects replaced 24 g/d of their dietary fat by 3 x 8 g buttons of the rapeseed oil margarine for six weeks. At the end of this period the subjects were randomised to continue on the rapeseed oil margarine without (C; n=50) or with (S1; n=100) 3 g/d of sitostanol ester added to the margarine. After six months, S1 was rerandomized either to continue with 3 g/d (S1; n=50) or with 2 g/d (S2; n=50) of sitostanol. The study lasted for one year. Sitostanol ester was well-tolerated. In C, serum total, LDL or HDL cholesterol or triglyceride values did not consistently change. In S1, serum total and LDL cholesterol were reduced significantly by 11% and 15%, respectively, after one year of treatment. In S2, the respective significant reductions were 8% and 13%. HDL cholesterol and serum triglyceride values were unchanged by sitostanol, so that the HDL/LDL cholesterol ratio was markedly increased. Serum plant sterol and cholestanol proportions were decreased and those of cholesterol precursors increased in the S1 and S2 groups. After returning back to the home diet the values in S1 and S2 returned back to the initial levels. In conclusion sitostanol ester dissolved in rapeseed oil margarine lowered effectively serum total and LDL cholesterol level during one-year treatment without any side-effects.

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REPLACING SUNFLOWER WITH FISH OIL IN MARGARINES: EFFECTS ON BLOOD LIPIDS AND APOLIPOPROTEINS

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Western populations are adviced to increase the consumption of fish. The incorporation of fish oil rich in n-3 polyunsaturated fatty acids (PUFA) in other foods might be an alternative. We investigated the effect of replacing sunflower with fish oil in a double-blinded study of 47 healthy males aged 30-60 y. After a 3 wk sunflower margarine (SO, 30 g daily) run-in period, the volunteers were randomly allocated to continued SO consumption or a fish-oil enriched margarine (FO) in which 4 g of sunflower oil had been replaced with 4 g of a high-quality natural fish oil (1 g long-chained n-3 PUFA). Results (means) from fasting (F) and non-fasting (NF) (3h after test meal rich in saturated fat) blood samples obtained after the run-in period (A) and after 4 wk of intervention (B) are shown in the Table

(units: mmol/L (lipids), g/L (apolipoproteins))

	FO-A	FO-B	SO-A	SO-B
Total cholesterol, F	4.75	4.76	4.63	4.56
HDL cholesterol, F	1.14	1.24*	1.16	1.24*
Triglycerides, F	1.06	0.92*	0.99	0.96
Triglycerides, NF	2.91	1.99*	2.09	2.26*
Apolipoprotein AI	1.49	1.51	1.48	1.52*
Apolipoprotein B	1.13	1.12	1.07	1.05

*Within-group difference significant at $p < 0.02$

We conclude that the replacement of 4 g of sunflower oil with fish oil in a diet causes a moderate reduction of fasting triglyceride values (13%), and a large reduction of non-fasting triglycerides (-32%) following a meal rich in saturated fat.

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ABSORPTION OF THE DIETARY ANTIOXIDANT QUERCETIN IN HEALTHY ILEOSTOMY VOLUNTEERS

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Objective. To quantify human absorption of the dietary antioxidant quercetin, which prevented oxidation of low density lipoproteins in vitro and was inversely associated with subsequent coronary heart disease in a cohort of Dutch elderly men [Hertog et al. Lancet 1993;342: 1007-1011]. Methods. Nine healthy ileostomy subjects followed a quercetin-free diet for 12 days. Once, in the morning of day 4, 8 and 12, one out of three different supplements, fried onions (mainly quercetin glucosides), pure quercetin rutinoside (a major quercetin component of tea), or pure quercetin aglycone was given at breakfast in random order. Subsequently, participants collected ileostomy effluent and urine for 13 hours. Absorption was calculated as the difference between the amount of quercetin in the supplements and the total amount of quercetin measured in the ileostomy effluent collected.
Results. Absorption of quercetin from onions amounted to 58% ± 15%, whereas the absorption of pure quercetin and quercetin rutinoside measured 34% ± 9%, and 28% ± 15% respectively. In urine less than 0.5% of the quercetin (glycosides) ingested was recovered within 13 hours. The pattern of excretion of quercetin in urine matched the disappearance of quercetin (glycosides) from ileostomy effluent.
Conclusions. Only quercetin from onions is well absorbed. Absorption probably is governed by the type of glycoside. More than 99% of the quercetin or glycosides is not excreted as such nor as conjugates.