

## THE EFFECTS OF FISH AND FISH OIL ON PLASMA LIPIDS

A.J.BROWN, D.C.K.ROBERTS, J.E.PRITCHARD and A.S.TRUSWELL

Recent studies have reported the lipid-lowering effects of the consumption of fish oils and in some cases fish (Herold and Kinsella 1986). Most of these studies have concentrated on the use of fish oil supplements such as MaxEPA (R.P.Scherer Pty Ltd) and it is in such studies that the most dramatic changes have been reported. What is less clear is whether the triacylglycerol(TAG)-lowering effects can be produced with amounts that can be naturally consumed as fish, rather than fish oil supplements. Epidemiological evidence, measuring reduced coronary heart disease risk as the outcome, suggests as little as two fish meals per week may be sufficient, although the authors do suggest that 100 g of fatty fish per day may be required to reduce platelet aggregation and prolong bleeding time.

In the present study we examined the effect of fish and fish oil on risk factors associated with cardiovascular disease. Twelve healthy men ranging in age from 18 to 40 (mean±SD: 26±8) were recruited from the Sydney University staff and student population and randomly assigned to three diets; fish, fish+MaxEPA (5 g/day) and a control diet which was essentially fish-free. The diets, designed to be isocaloric and equivalent in P/S ratio, were fed as the evening meal for five out of seven days for six week periods. Duplicate blood samples were taken at the beginning and end of each period and a six week wash-out period was allowed between diets. Lipoproteins were separated by ultracentrifugation.

The Table shows the average and range of changes (mM) in lipid parameters for eight of the 12 subjects after six weeks on one of the three diets.

mM	Control	Fish	Fish+MaxEPA
Plasma TAG	0.16 (-0.08,0.58)*	-0.21 (-0.99,0.25)	-0.09 (-0.71,0.50)
VLDL	0.14 (-0.36,0.79)	-0.08 (-0.39,0.05)	-0.05 (-0.22,0.27)
Plasma CHOL	-0.05 (-0.80,0.58)	-0.28 (-1.28,0.27)	-0.04 (-0.71,0.58)
VLDL	0.10 (-0.75,1.11)	-0.24 (-0.70,0.07)	-0.12 (-0.48,0.21)
LDL	0.45 (-0.23,1.14)	0.17 (-0.70,0.75)	0.25 (-0.47,0.94)
HDL <sub>2</sub>	-0.02 (-0.37,0.21)	0.04 (-0.15,0.17)	0.10 (-0.16,0.51)
HDL <sub>3</sub>	-0.06 (-0.20,0.04)	0.00 (-0.16,0.15)	-0.07 (-0.24,0.07)

\* Range (lower limit, upper limit)

These preliminary data suggest that the fish diet reduced plasma TAGs at least as well as the MaxEPA supplemented diet. The reduction occurred in the VLDL component of the TAGs. Plasma cholesterol was also lowered on the fish diet with MaxEPA supplementation attenuating the decrease. Again, it was the VLDL component of cholesterol which exhibited the greatest decline on the fish diet. LDL cholesterol increased on all diets, but least on the fish diet. Changes in HDL cholesterol were not marked but tended to inversely reflect the changes in VLDL TAG, decreasing when VLDL TAG rose.

These preliminary findings suggest that in modifying plasma lipids, five fish meals per week are at least as effective as the fish plus MaxEPA.

HEROLD, P.M. and KINSELLA, J.E. (1986). *Am. J. Clin. Nutr.* 43: 566.