PLASMA CHOLESTEROL LOWERING POTENTIAL OF EDIBLE OIL BLENDS SUITABLE FOR COMMERCIAL USE

M. NOAKES, P. J. NESTEL, G. B. BELLING
R. MCARTHUR, P. M. CLIFTON, and M. ABBEY

A significant proportion of the fats used in commercial foods is derived from highly saturated fats and oils and there is evidence to suggest that this can account for potentially one third of the fat intake in the average Australian diet (BAGHURST etal 1987). Faced with an apparent increase in the proportion of household income spent on snacks and takeaway foods (AUSTRALIAN BUREAU OF STATISTICS 1990), a major challenge exists in developing cheap and adaptable fats for the food industry which are compatible with the public health demand for less saturated fat.

We tested semi-hardened blends of edible oils suitable for commercial use, with a lower than conventional saturated fatty acid content, for their effects on plasma cholesterol. Twenty-six mildly hypercholesterolaemic men took part in a double-blind cross-over experiment in which two test blends were compared to two control dietary periods resembling the Australian fat intake; PMS ratio 0.4:0.9:1. The test blends provided approximately 50% of total fat intake.

The PMS ratios in the test diets were about 0.8:1.3:1, and both resulted in significantly lower LDL cholesterol concentrations (reductions of up to 7.7%). (see table). HDL cholesterol and plasma triglycerides were unchanged. The trans fatty acid (mainly elaidic) content of the blends was 16%, raising its contribution to energy by 4%, but without apparent effect on LDL and HDL levels.

Subsequent to these findings the test blends have been successfully incorporated into pastry goods, biscuits and breakfast cereals.

Plasma Lipids mmol/l	DIETS * Control 1	Control 2	Blend 1	Blend 2
Total cholesterol	5.82 ± 0.82	5.72 ± 0.80	5.57 ± 0.82 •	5.49 ± 0.70 ••
LDL cholesterol	4.13 ± 0.80	4.03 ± 0.75	3.92 ± 0.77 •••	3.83 ± 0.69 •••
HDL cholesterol	1.11 ± 0.26	1.15 ± 0.24	1.10 ± 0.24	1.11 ± 0.27
Total Triglyceride	1.49 ± 0.63	1.39 ± 0.44	1.41 ± 0.47	1.41 ± 0.47

• $p < .005$ •• $p < .01$ ••• $p < .001$

* means ± standard deviations

We conclude that provided the overall linoleic:palmitic acid ratio in commercial oil blends exceeds that in the prevailing national diet, partial hydrogenation will not negate the LDL lowering potential . These results indicate that the substitution of oil blends similar to those tested for many of those currently used in commercial food manufacture in Australia could contribute importantly to a lowering in the average plasma cholesterol level.

AUSTRALIAN BUREAU OF STATISTICS. (1990), Household Expenditure Survey, Australia ABS Cat. No. 6535 (Commonwealth Government Printer)
BAGHURST, K., CRAWFORD, D., RECORD, S., WORSLEY A., BAGHURST, P. AND SYRETTE J. (1987), The Victorian Nutrition Survey. Part III ISBN O 64304308X (CSIRO Division of Human Nutrition; Adelaide)

CSIRO, Division of Human Nutrition, Adelaide, South Australia, 5000