

Effect of monounsaturated fat in the diet on the serum lycopene levels

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Epidemiological data suggest that populations with higher serum/tissue levels of carotenoids have a lower risk of coronary heart disease (CHD) (1,2). Lycopene, a carotenoid mainly found in tomatoes, has been suggested to have the greatest antioxidant capacity of the carotenoids found in fruits and vegetables. Carotenoids are fat-soluble compounds and their absorption from the diet into the body may depend on the amount of dietary fat ingested. For years there has been debate about what energy source should replace the saturated fat in the diet, to give the optimum serum lipid profile to reduce CHD risk. Studies have investigated the effect of different amounts of total fat on the serum levels of carotenoids especially β -carotene and lutein, but to our knowledge no study has looked at the effect of different amounts of fats in the diet on the serum lycopene levels.

A randomised crossover dietary intervention study, partially funded by Grains Research and Development Corporation, Canberra, Australia and Meadow Lea Food Ltd, Mascot, Australia was conducted in 13 healthy men aged 20 to 70 years. The aim of the study was to compare the effects of monounsaturated fat enriched (MUFA) diet (38% of energy from fat) and high carbohydrate low fat (HCLF) diet (15% energy from fat) with controlled lycopene content, on serum lycopene levels. Main sources of lycopene in the diet were tomato paste and tomato soup (donated by Heinz Watties, Melbourne, Australia). The lycopene content of the diet was 20.3 mg/day. The diets were designed to be low in other carotenoids. The diets were of 14 days duration with a washout period of six weeks. Before the start of the two dietary periods, subjects were asked to take low carotenoid diet (LCD) for two days to avoid the acute peaks in serum lycopene levels which may occur with a high intake of lycopene rich food 10-12 hrs before the blood sample (3).

Compared to baseline (after two days of LCD) serum *trans*, *cis* and total lycopene levels increased after the MUFA and HCLF diet periods. There was no significant difference in *trans*, *cis* and total lycopene levels at the end of two diets. This study indicated that 38% of energy from fat in the diet compared to 15% of energy from fat with a modest amount of lycopene in the diet has no differential effect on the serum lycopene levels.

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