EFFECT OF MONOUNSATURATED FAT IN THE DIET ON THE SERUM CAROTENOID LEVELS

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CANDIDATE DECLARATION

I certify that the thesis entitled

"Effect of monounsaturated fat in the diet on the serum carotenoid levels"

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ABBREVIATIONS USED IN THIS THESIS

ATBC  Alpha Tocopherol Beta-carotene
BMI  Body Mass Index
BHT  Butylated Hydroxytoluene
CARET  Carotene and Retinol Efficacy Trial
CHD  Coronary Heart Disease
CI  Confidence Intervals
CSIRO  Commonwealth Scientific and Industrial Research Organisation
CVD  Cardiovascular Disease
EDTA  Ethylenediamine Tetraacetic Acid
GLM  General Linear Model
HDL  High Density Lipoprotein
HPLC  High Pressure Liquid Chromatography
LDL  Low Density Lipoprotein
MI  Myocardial Infarction
MJ  Mega Joule
MUFA  Modified fat monounsaturated fat rich diet
PBS  Phosphate Buffer Solution
PEG  Polyethylene Glycol
PUFA  Polyunsaturated Fatty Acid
RPM  Revolutions Per Minute
SD  Standard Deviation
SEM  Standard Error of Mean
SFA  Saturated Fatty Acid
SPSS  Statistical Packages for Social Scientists
TBARS  Thiobarbituric Acid Reactive Substances
VLDL  Very Low Density Lipoprotein
WHO  World Health Organisation
Epidemiological data suggest that populations with higher serum/tissue levels of carotenoids have a lower risk of coronary heart disease (CHD), possibly due to the antioxidant capacity. 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 compared monounsaturated fat rich diets with high carbohydrate, low fat diets and have found that both diets decrease serum cholesterol and low-density lipoprotein (LDL) cholesterol levels. Results for high-density lipoprotein (HDL) cholesterol and triglycerides have been inconsistent. However, it is of interest to study the effects of different diets on lipid oxidation, as this may also influence CHD risk.

Studies have investigated the effect of different amounts of total fat on the serum levels of carotenoids especially beta-carotene and lutein, but to our knowledge no study has looked at the effect of different amounts of fats on the serum lycopene levels, and whether this could subsequently affect the oxidation of LDL in vitro.