

# EFFECT OF COCONUT, SOYA AND GINGELLY OIL ON GUINEA PIG LIPID STATUS

E.M.I. EDIRISINGHE, P.H.P. FERNANDO AND P.A.J. PERERA

*Department of Biochemistry, Faculty of Medicine, University of Peradeniya*

A diet that is rich in saturated fat is considered atherogenic and therefore nutritionists have recommended limiting the proportion of calories derived from saturated fat, as a means of reducing the incidence of coronary atherosclerosis. According to the available health statistics of 1998, coronary heart disease is a leading cause of mortality and morbidity in the middle-aged population of Sri Lanka. Among the possible factors, high intake of coconut oil is believed to play a central role in development of coronary atherosclerosis. This belief resulted in the reduction of coconut oil use and Sri Lankans shifted to consumption of other vegetable oils in the market.

The cholesterol metabolism of the guinea pigs closely resembled that of human, carrying the majority of cholesterol in the low-density lipoprotein (LDL) fraction and responds to change in the dietary fat quality, especially in the absence of dietary cholesterol.

Four types of guinea pig diets were formulated to meet specific requirements with defatted coconut poonac, textured soya protein, wheat flour, paddy husk, mineral and vitamin supplements, and 5 % (w/w) fat in the form of coconut oil, soya oil, 1:1 mixtures of coconut and soya oil or gingelly oil. Four groups of male Hartly guinea pigs, 10 animals in each, weighing between 300 – 450g were assigned to one of the four diet containing above mentioned oils. After 4 weeks on the test diets, animals were bled after 14h fasting and their serum analyzed for total cholesterol and triglycerides. Results were analyzed using one-way anova and least significance test.

All serum total cholesterol values were significantly different from each other. Coconut oil gave a high serum total cholesterol value of  $59.4 \pm 4.0$  mg/dl, whilst gingelly oil gave a low serum total cholesterol value of  $31.8 \pm 6.8$  mg/dl. The serum cholesterol level of coconut, soya mixture (1:1) and soya oil consuming animal groups was  $52.8 \pm 8.5$  mg/dl and  $38.2 \pm 7.3$  mg/dl respectively. There was no marked difference in the mean serum triglyceride levels in the groups that were fed with different oils.

When fatty acid composition of different oils are considered in relation to their effect on blood lipid status, it appears that saturated fat increase serum total cholesterol, while mono and polyunsaturated fats do not increase serum total cholesterol. The serum triglyceride level appears to have no correlation with quality of fat.