

EFFECT OF DIETS CONTAINING VIRGIN OLIVE , CANOLA OR LINSEED OILS ON SERUM LIPID AND LIPOPROTEIN LEVELS OF RATS

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ABSTRACT

Three vegetable oils (virgin olive, crude canola, or linseed oils) were used as diet additives to compare their effects on lipid profile of blood serum of experimental rats in the presence of egg yolk as a source of cholesterol. Corn meal (1.6% fat) was used as control diet, the positive control diet composed of corn meal plus 9% egg yolk (about 0.15% cholesterol). The other three diets composed of positive control plus 14% olive, canola or linseed oils. Lipid parameters were determined in rat's blood serum after 21, 36 and 46 days from feeding . Obtained data revealed that both canola and linseed oils containing diets significantly decreased total cholesterol (TC), triacylglycerol(TG) and low-density lipoprotein cholesterol (LDL-c) and increased high-density lipoprotein cholesterol (HDL-c) levels in relation to positive control diet. Data of olive oil containing diet showed a significant increase in TC, TG, and HDL-c at the end of nutrition experiment. Whereas no significant difference in LDL-c between positive control and olive oil containing diet.

INTRODUCTION

Lipoproteins are large molecules that facilitate the transport of non polar fats in a polar solvent, the blood stream. Low-density lipoproteins (LDL) are the major carriers of cholesterol in the plasma, and thus a strong relationship exists between elevated LDL levels and cardiovascular disease (Martin *et al.*, 1986). High density lipoproteins are the most dense particules with the highest protein and phospholipids content (Jonas, 2002), their levels are inversely associated with atherosclerosis, i.e high levels are protective (Williams *et al* ,1990; Brown and Fuster ,1996)

For good cardiovascular health, the concentration of total cholesterol in blood must be kept low with a low level of LDL. The drugists are concerning with developing new medications to solve the problem of elevated cholesterol and triacylglycerol levels in blood stream of humans to minimize the risk factors of coronary heart disease. On the other hand, nutritionalists are meditating on improving lipid profile of blood serum and liver of the individuals by controlling the composition of the daily diets.

Several publications dealt with the desirable effect of vegetable oils on modulating hyperlipoproteinemias in animals and humans (Kris-Etherton *et al.*, 1999; Wilson *et al.*, 2000; Mangas-Cruz *et al.*, 2001).

Dietary fat selection is known to exert a major influence on circulating cholesterol levels, they are raised with consumption of fats containing saturated fatty acids and reduced with fats rich in monounsaturated and polyunsaturated fatty acids (Mattson and Grundy, 1985; Wilson *et al*, 2000) .The studies which have demonstrated the effects of dietary fatty acids on serum and liver lipid levels have not always been consistent. Some studies have shown that monounsaturated fatty acids reduce serum lipid levels,