



Section A

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Protective effects of virgin coconut oil against hepatosteatosis and lipid peroxidation in Wistar rats

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Hepatic steatosis and oxidative stress are main mechanisms involved in the pathogenesis of non alcoholic fatty liver disease (NAFLD). Both quantitative and qualitative aspects of dietary fat influence triglyceride deposition in the liver and the progression to NAFLD. Studies have demonstrated a protective effect of some dietary oils against NAFLD. The aim of the present study was to investigate the effects of virgin coconut oil and white coconut oil on hepatosteatosis and lipid peroxidation in Wistar rats. Five groups of male Wistar rats, with 5 rats per group, were maintained on five test diets. The control group was on the standard rat diet containing soya oil (2%). For test groups 2, 3, 4 and 5 soya oil in the standard recipe was replaced by VCO (2%), WCO (2%), VCO (4%), and WCO (4%) respectively. Rats were maintained on the test diets for 22 weeks and were euthanized and liver tissues were collected. Lipid peroxidation of liver tissues as a marker of hepatic oxidative stress was determined by TBARS assay and expressed as nmolmalonaldehyde (MDA)/ g protein. Histopathology following hematoxylin and eosin staining was done to assess the degree of steatosis. Data were analysed by one way ANOVA using SPSS 23. With the increase of VCO from 2% to 4% in the diet, the hepatic MDA levels significantly decreased (18.7 ± 1.7 vs 14.9 ± 2.7 , $p < 0.05$). In comparison with the 4% VCO diet, the 4% WCO diet resulted in a significantly higher level of lipid peroxidation (14.9 ± 2.7 vs 23.7 ± 6.0 , $p < 0.05$). The increased antioxidant potential of the liver in rats maintained on VCO diets is indicated by the remarkable decline of hepatic lipid peroxidation. The livers of the rats on WCO diets showed significant hepatic steatosis when compared with rats on VCO diets (27.5% vs 3.1%, $p < 0.05$). Although VCO and WCO consist of the same fatty acid profile this difference in hepatic steatosis can also be attributed to their antioxidant properties since hepatic oxidative stress is known to be associated with reduced VLDL secretion leading to the accumulation of triglycerides in the liver. In conclusion, due to its high antioxidant potential dietary VCO exerts a protective effect on the liver by reducing lipid peroxidation and steatosis in Wistar rats.

Key words: Non alcoholic fatty liver disease, lipid peroxidation, hepatosteatosis, oxidative stress, virgin coconut oil.

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