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**EFFECT OF COCONUT FAT ON SERUM AND AORTIC TISSUE
LIPIDS, AND ENDOTHELIAL DEPENDENT RELAXATION OF
BLOOD VESSELS**

-A STUDY IN GUINEA PIG-

A THESIS PRESENTED BY

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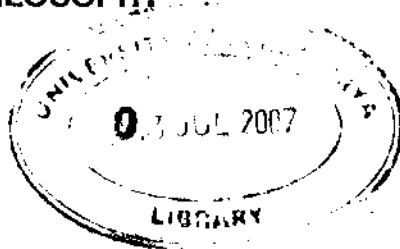
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**EFFECT OF COCONUT FAT ON SERUM AND AORTIC TISSUE
LIPIDS, AND ENDOTHELIAL DEPENDENT RELAXATION OF
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Atherogenicity of saturated fat is well documented. Coconut fat is a rich source of cholesterogenic-saturated fatty acids (CSF). Sri Lankans use coconut extensively to prepare their daily food and have a high dietary intake of coconut fat. Although coronary heart disease is one of the leading causes of death in Sri Lanka, the role of coconut consumption remains controversial.

The present study was undertaken in an animal model to test the hypothesis that a diet rich in coconut fat induces atherosclerosis. The experiments were done on guinea pigs, which lipid metabolism is similar to that of humans. The anti-atherogenic effect of grape seed extract (GSE) was also studied. This extract is abundant in polyphenolic antioxidants.

Study was done in two phases. The animals in each phase were age and weight matched. Groups of guinea pigs (n=6) were assigned to different isocaloric diets

containing 5% (w/w) fat. Fat content was varied as follows: coconut oil (Co), coconut + corn oil (1:1) (Co+ Cor) and corn oil (Cor). After 12 weeks of feeding,

animals were sacrificed and blood and aortic tissue were collected to estimate total cholesterol, serum and aortic fatty acids in one study and lipid profiles and endothelium dependent relaxation (EDR) in the other. Same measurements were made in an animal group fed the Co diet with 1mg GSE/g food.

The animals that consumed Co diet had the significantly high concentrations of plasma total cholesterol (77%), LDL cholesterol (97%), HDL cholesterol (53%), serum CSF (16%) and aortic cholesterol (51%) compared to the lowest values reported in animals fed Co+Cor diet. Bradykinin induced EDR was significantly lower in animals fed Co (24%) compared to animals fed Co+Cor diet.

Feeding the Co diet with GSE significantly reduced the aortic cholesterol (29%), but did not improve plasma lipid profiles and EDR. GSE caused EDR even when the vessels were not responsive to acetylcholine.

It is concluded that coconut fat is atherogenic in the guinea pig. This conclusion is based on the high cholesterol content of the aorta and impaired bradykinin induced EDR in animals fed the Co diet. Partial replacement of dietary saturated coconut fat with unsaturated corn fat improved serum lipids.