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EFFECT OF DIETARY FAT ON BLOOD LIPIDS

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Metabolism of lipids in the guinea pig, especially those of cholesterol, closely resembles those in man. Guinea pig was therefore chosen as a model to study the effect of saturated and unsaturated fat on cholesterol metabolism in man.

An isocaloric diet, compatible with dietary requirements of the guinea pig was formulated using wheat flour, textured soya protein, defatted poonac, vitamin and mineral premix, mineral supplement and refined coconut oil or soya oil as the major source of dietary fat. The fat chosen provided 15% of the energy in the diet. Cholesterol was added to some of the diets to give a final composition of 0.1% by weight.

Animals were initially fed a control animal house diet, consisting of broiler starter feed, supplemented with 5% fish meal, 5% whole soya grits and fresh grass for a period of 1 month. They were then fasted overnight for a period of 14h and bled by cardiac puncture. The blood was centrifuged, allowed to clot and the serum separated within 2 h. Serum was analyzed for total cholesterol, HDL cholesterol and triacylglycerol using the enzyme based Randox kit method. The animals were then fed test diets, differing in the degree of unsaturation of the fat and the composition of cholesterol, for a period of 1 month and the blood analyzed for lipids as before.

Each animal was used as its own control, whenever possible. However, in the early part of the project, many an animal died following bleeding by cardiac puncture. This technique has now been satisfactorily perfected.

Changing of diet from control to coconut oil resulted in an elevation of total cholesterol, HDL cholesterol and triacylglycerol levels. Whereas, inclusion of cholesterol to the extent of 0.1% w/w in the diet resulted in a further increase in the total cholesterol, with a lowering of triacyl glycerol levels. Replacement with soya oil reduced the total cholesterol and HDL cholesterol levels, but increased the triacylglycerol levels. Inclusion of cholesterol to the extent of 0.1% w/w in the same diet resulted in an increase in the total cholesterol and triacylglycerol levels. Significance of these findings will be analyzed.