tions of cholesterol caused very marked changes in the rate of hydrolysis of soybean oil. At low concentrations of cholesterol (5%) an optimum activity occurred in the presence of 20% phospholipid. With 15% cholesterol the optimum concentration of phospholipid was 30%, and at 30% cholesterol the optimum concentration of phospholipid was 50%. The relative activity at these optimum phospholipid concentrations was 65, 100 and 70% respectively.

These results show that the lipid composition of the substrate emulsion has a very marked effect on the activity of lipoprotein lipase. It is also known that surface-active agents used in the preparation of emulsions influence the activity (Fielding, 1970a; Doizaki & Zieve, 1968), but it is not yet known whether changes in plasma-lipid composition affect the tissue uptake of circulating triglyceride. The results of these experiments *in vitro* would suggest that the cholesterol concentration and the relative composition of the plasma lipids could be of importance in the activity of lipoprotein lipase *in vivo*.

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Dietary Alterations in Polyunsaturated Fatty Acids in Guinea-Pig Brain, Liver and Muscle

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Human cardiomyopathies are more commonly found in low socio-economic groups in parts of the world where the incidence of protein malnutrition is high (Shaper & Coles, 1965; Crawford, Gale, Somers & Hansen, 1970). The response of the endocardium and myocardium to low-protein diets has been demonstrated experimentally (Spatz, 1965, 1969; McKinney & Crawford, 1965; Reid & Berjack, 1966). In relating these findings to the human situation it became apparent that a food selection pattern leading to protein malnutrition is also likely to be poor in essential fats. Protein malnutrition arises through the selection of vegetable foods rich in carbohydrate; these are also poor in proteins and essential fats. Seeds, which provide the richest vegetable sources of protein and essential fats, also contain tocopherols. Consequently a diet

deficient in the essential fats is likely to be deficient in tocopherol, and low vitamin E concentrations have been recorded in the blood of communities using low-protein diets (Tulloch & Sood, 1967). Groups of six guinea pigs have been fed on diets deficient in the essential fats and tocopherols. Liver, muscle and brain were analysed and no differences could be found in the constituent phospholipid groups such as ethanolamine, choline and serine phosphatides. On the other hand significant alterations occurred in the fatty acids used for their construction. In the liver, docosa-hexaenoate was low ($1.1 \pm 0.3\%$, cf. $6.0 \pm 0.7\%$) and there was an increase in the docosa-, tri-, tetra- and penta-enoate contents. Eicosatetraenoate content ($5.5 \pm 0.7\%$) was less than in controls ($6.3 \pm 0.5\%$), but this was small compared with the fall in docosa-hexaenoate ($C_{22:6, n-3}$) content. The eicosatrienoate ($C_{20:3, n-9}$) content increased in a manner characteristic of fat deficiency.

Linoleate and linolenate contents also fell in liver and muscle, but there were still significant proportions of linoleate (8–15%) despite ataxia, other clinical symptoms and the severe changes in the longer-chain acids. In brain neither linoleate nor linolenate occurs in significant amount, and consequently changes were most readily seen in the long-chain acids, again with a loss of docosa-hexaenoate, the proportion of which dropped by one-third. This change was again accompanied by relative increases in docosa-, tri-, tetra- and penta-enoate contents.

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Plasma Structural Lipids in Groups at High and Low Risk to Atherosclerosis

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According to Walker (1963) coronary heart disease was the cause of death in 42.4% of white and 3.6% of Bantu males in the 55–64-year age groups in Johannesburg; epidemiological evidence and the international surveys (Kyu Taik Lee, Daoud, Jarmolych, Jakovic & Florentin, 1964; Scott, Likimani, Morrison, Thuku & Thomas, 1963)