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EFFECTS OF DIETARY FIBRE ON PLASMA CHOLESTEROL AND TRIGLYCERIDES IN MEN

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In a previous report (Farrell, Girle & Arthur, 1977) we outlined an experiment in which 13 male subjects were placed on a low fibre dietary regimen of 22 d, followed by a high fibre dietary regimen of 26 d. Two additional subjects remained on the low fibre regimen throughout. Both diets contained similar amounts of protein, fat and carbohydrate from the same sources, except for the addition of wheat bran (12 g/d) and wholemeal instead of white bread. At the commencement of the experiment, at the end of the low fibre regimen, and at the end of the high fibre regimen, 5 ml of venous blood was taken in heparin at 0830 h from the subjects fasted overnight. Following centrifugation, plasma was stored at -20°C, and subsequently analysed for cholesterol and triglycerides using enzymatic methods.

The subjects (77.2 ± 1.4) were within the accepted range of height for weight which remained constant through the study. Plasma cholesterol and triglyceride concentrations are shown in Table 1 for the 13 subjects.

TABLE 1. Mean (±SE) concentration of cholesterol and triglyceride in plasma of 13 fasted subjects, taken at the beginning of the experiment (1), at the end of the low fibre (2) and of the high fibre (3) regimen.

Regimen	1	2	3
Cholesterol (g/ℓ)	1.42 ± 0.07^{a**}	1.69 ± 0.09^{b}	1.33 ± 0.06^{a}
Triglycerides (mg/ℓ)	735 ± 65^{a}	488 ± 50^{b}	448 ± 42^{b}

**a,b Values within the same row with the same superscripts are not different (P>0.05)

Variation between the two control subjects for cholesterol and triglyceride values was such that the standard deviation was much greater than in treated subjects, thus meaningful comparisons were impossible. Triglyceride levels are indicative of liver fat synthesis from both absorbed fat and carbohydrate; these were essentially from the same sources in both diets, thus no differences in levels would be expected in regimen 2 and 3. However daily energy (11 MJ) and sucrose intake during the experiment would be considered low, consequently the initial pre-experimental concentration may have been a reflection of an increased sucrose and energy intake.

The significant (P<0.01) increase in cholesterol level observed at the end of the low fibre regimen was probably attributable to the high fat content of the diet, particularly of saturated fat. Fat contributed 36% of the daily dietary energy. It has been suggested that dietary fibre may bind bile salts and decrease digesta transit time. This reduces opportunity for their absorption from the ileum and causes them to be excreted in large amounts. Cholesterol is a major precursor of bile salts, and this could explain the reduction in cholesterol concentrations observed at the end of the experiment. It is suggested that diets high in fibre can lower plasma cholesterol levels, and this may reduce the incidence of heart disease.

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