

COMPARISON OF PLATELET AND PLASMA LIPID FATTY ACID PATTERNS AS INDICATORS OF DIETARY INTAKE

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In a 5/3 week randomised cross-over trial, 30 free-living male and female volunteers were asked to take palmolein or canola oil as approximately half of their fat intake, eaten as the frying oil on potato crisps; diets were otherwise low in fat. Fasting bloods were collected at the beginning and at the end of each dietary period for 3 consecutive mornings. Platelets were separated from platelet-rich plasma and 3 days' yield were pooled, washed and then directly transesterified with methanol : benzene (4:1) by the method of (Lepage and Roy). Tridecanoic acid was used as internal standard. For plasma lipids the first of 3 bloods were extracted by Folch wash. Phospholipids were separated from neutral lipids by column chromatography. Fatty acid methyl esters were prepared for phospholipids as above and with sulphuric acid in methanol (6%) by the Myher and Kuksis plate technique for the neutral lipids. Methyl esters were analysed by capillary gas liquid chromatography using a fused carbon-silica column coated with cyanopropylphenyl and temperature programming.

The table shows which differences between fatty acids were significant in the four types of blood lipid analysed for the major fatty acids. Friedman two-way analysis of variance showed no effect of order of feeding. Wilcoxon's signed-rank test was used for the significance of difference between combined palmolein and combined canola bloods.

FATTY ACID	PLASMA PHOSPHOLIPIDS	PLASMA CHOLESTEROL ESTER	PLASMA TRIGLYCERIDES	PLATELETS
C16:0	palmitic acid	.04	.01	.005
C18:0	stearic acid	N.S	N.S	N.S
C18:1(n-9)	oleic acid	N.S	N.S	.0007
C18:2(n-6)	linoleic acid	N.S	N.S	N.S
C18:3(n-3)	linolenic acid	.0002	.0007	.0005
C20:4(n-6)	arachidonic	N.S	.04	.02

Differences Between Palmolein and Canola Diets

The Palmolein diet was higher in 16:0; the canola oil diet was higher in 18:1 and 18:3, ω -3 and to a lesser degree in 18:2, ω -6. The table suggests that platelet lipids were most sensitive for reflecting intake of 16:0 and 18:1; ω -9. Differences in 18:3, ω -3 were significant in all blood lipids except plasma phospholipids. Mean differences in 18:2, ω -6 were greatest in plasma triglycerides (not significant). 20:4 was increased in platelets and plasma triglycerides on the higher linoleic acid diet.