

Omega-3 fatty acid status in Australian omnivores and vegetarians

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Dietary intervention and epidemiological studies have shown that the fatty acid profile of platelet and plasma/serum phospholipid (PL) reflects an individual's type of dietary fat intake (1). It has been suggested that decreased n-3 polyunsaturated fatty acid (PUFA) status are associated with increased risk of cardiovascular disease (2). The aim of this cross-sectional study was to investigate plasma PL fatty acid composition as an index of recent n-3 fatty acid status in Australians. Fifty-one healthy females aged between 21 to 55 years (30 ovo-lacto vegetarians and 21 omnivores), 103 healthy male aged 22-55 years (43 ovo-lacto vegetarians and 60 omnivores) were recruited through advertisements in the Melbourne metropolitan area. Each volunteer completed a semi-quantitative food frequency questionnaire and gave a blood sample. Plasma PL were separated by TLC and the fatty acid compositions were determined by the method reported previously (3).

Fatty acid	Male		Female	
	Omnivorous (n = 60)	Vegetarians (n = 43)	Omnivorous (n = 21)	Vegetarians (n = 30)
Total SFA		40.55 ± 1.38	39.71 ± 2.42**	40.36 ± 2.04
Total MUFA	12.06 ± 1.18	12.58 ± 1.24	12.84 ± 1.16	12.51 ± 1.54
18:2n-6	22.37 ± 2.82	25.91 ± 3.16***	23.64 ± 2.72	25.93 ± 3.55‡‡
20:3n-6	3.51 ± 0.69	3.30 ± 0.85	3.30 ± 0.60	2.95 ± 0.69†
20:4n-6	10.45 ± 1.75	9.59 ± 1.92*	9.83 ± 1.71	9.34 ± 2.25
22:4n-6	0.43 ± 0.06	0.48 ± 0.11**	0.36 ± 0.07***	0.43 ± 0.08‡‡
22:5n-6	0.24 ± 0.06	0.25 ± 0.08	0.25 ± 0.08	0.24 ± 0.06
Total n-6	37.00 ± 2.14	39.53 ± 2.53***	37.38 ± 3.21	38.89 ± 3.24‡
18:3n-3	0.19 ± 0.08	0.27 ± 0.13*	0.23 ± 0.10	0.24 ± 0.10
20:5n-3	1.22 ± 0.21	1.08 ± 0.24**	0.85 ± 0.22***	0.91 ± 0.25††
22:5n-3	1.22 ± 0.21	1.08 ± 0.24**	3.51 ± 0.54	2.80 ± 0.86†††,‡‡‡
22:6n-3	3.33 ± 0.75	2.20 ± 0.75***	3.51 ± 0.54	2.80 ± 0.86†††,‡‡‡
Total n-3	5.76 ± 1.01	4.25 ± 0.95***	5.54 ± 1.00	4.55 ± 1.17‡‡‡
n-3/n-6	0.16 ± 0.03	0.11 ± 0.03***	0.15 ± 0.03	0.12 ± 0.04‡‡‡

Values are means ± SD. Significance of differences: *P < 0.05, **P < 0.01, ***P < 0.001 compared with male omnivorous; †P < 0.05, ††P < 0.01, †††P < 0.001 compared with male vegetarians; ‡P < 0.05, ‡‡P < 0.01, ‡‡‡P < 0.001 compared with female omnivorous.

Compared with vegetarians, both male and female omnivores have a significantly higher proportion of plasma PL 20:5n-3, 22:6n-3, total n-3 PUFA and ratio of n-3/n-6. The 22:5n-3 was significantly higher in male omnivores than female omnivores, which suggests that consumption of red meat was more in male omnivores than in female omnivores since 22:5n-3 is a predominant n-3 PUFA in red meat (4).

References

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