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Advice to consume 1–2 portions of oily fish per week improves vitamin D status

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Dietary sources of vitamin D may only play a minor role in meeting vitamin D requirements compared with ultraviolet exposure⁽¹⁾. Data from the National Diet and Nutrition Survey suggest that vitamin D insufficiency, defined as serum 25-hydroxyvitamin D (25(OH)D) < 25 nmol/L, is widespread in the UK⁽²⁾. Except for oily fish, there are few rich dietary sources of vitamin D. Furthermore, high intakes of unrefined cereals can contribute to low serum 25(OH)D concentrations by increasing the catabolism of vitamin D which is thought to be due to their high phytic acid content interfering with calcium absorption⁽³⁾. We report the association between dietary vitamin D intake and 25(OH)D at baseline in subjects recruited into a randomised controlled trial, and the changes in vitamin D intake and 25(OH)D following randomisation to two dietary interventions.

The CRESSIDA trial (ISRCTN92382106) randomised 165 healthy non-smoking men and women aged 40–70 y to a cardioprotective (CP) or a control (C) diet for 12 wks. Blood samples and 4-d diet records completed at baseline and follow-up were available for analysis in 162 subjects. The cardioprotective diet included salt < 6 g/d, saturated fatty acids < 10% of food energy, oily fish intake 1–2 portions/wk and fruit and vegetables 5 portions/d, and supplied at least half of the cereal intake from wholegrains. The control diet was a typical well balanced British diet but contained oily fish less than once a month. All subjects abstained from dietary supplements throughout the study. Table 1 shows vitamin D intakes and plasma concentrations of 25(OH)D determined by immunoassay.

	Vitamin D intake (µg/d)				25(OH)D (nmol/L)			
	CP (n = 80)		C (n = 82)		CP (n = 80)		C (n = 82)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Baseline	3.0	2.5	2.9	2.3	58.0	18.7	60.3	22.8
Follow-up	6.6*	4.3	2.7	1.4	68.4*	23.0	58.4	19.9

*P < 0.001 compared to control group..

Dietary vitamin D intake and 25(OH)D concentrations were correlated at baseline ($r = 0.277$; $P < 0.001$). Vitamin D intake increased following the cardioprotective diet compared with the control as a consequence of the increased consumption of oily fish. Serum 25(OH)D concentrations at 12 weeks were 9.2 nmol/L ($P < 0.001$) greater in the CP diet group compared to the C group when adjusted for baseline 25(OH)D, age, BMI, gender, ethnicity and seasonality. This increase is similar to the increase in 25(OH)D found after supplementation with 5 µg vitamin D3 per day for 4 weeks in the winter months⁽⁴⁾. In conclusion, the consumption of oily fish 1–2 times a week improves vitamin D status, and the inclusion of wholegrain cereals (mainly breakfast cereals and bread) as part of a cardioprotective diet does not have an adverse effect on vitamin D status.

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