

Dietary vitamin E intake is associated with greater fat-free mass and percentage fat-free mass in the EPIC-Norfolk cohort

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The European Working Group on Sarcopenia in Older People (EWGSOP) has defined sarcopenia as ‘a syndrome characterised by progressive and generalised loss of skeletal muscle mass and strength with a risk of adverse outcomes such as physical disability, poor quality of life and death⁽¹⁾. Vitamin E is an anti-oxidant and an anti-inflammatory nutrient, essential for human health⁽²⁾. It is plausible that the consumption of vitamin E, because of these properties, may prevent muscle loss^(3,4). The current study therefore aimed to investigate the potential association of dietary vitamin E intake with fat-free mass (FFM), which is commonly used as an indirect marker for skeletal muscle mass, in a UK population.

Analyses were conducted on 6,350 men and 7,990 women from the EPIC-Norfolk cohort, (aged 39–79 years)⁽⁵⁾, who completed a baseline health and lifestyle questionnaire and a 7-day food diary. At a second health check (2HC, age range 42–82 years), fat mass (FM) was measured using bioimpedance (TANITA Body Fat Monitor/Scale TBF-531), from which FFM (kg) was calculated. The Norfolk District Health Authority Ethics Committee approved all procedures. Multivariable linear regression analysis was used to investigate differences in FFM and percentage FFM (FFM%; $FFM \div \text{total mass} \times 100$) across sex-specific quintiles of dietary vitamin E intake (1,270 men, 1,598 women per quintile). Model one included adjustment for age, smoking status, physical activity, corticosteroid and statin use, social class, ratio of energy intake to estimated energy expenditure, number of food diary days, energy intake, percentage energy from protein, and menopausal and HRT status in women, and for FFM, FM was included in the model. Model 2 included vitamin E supplement use. Statistical analyses were performed with STATA (v12; Stata Corp., USA).

Mean (SD) age of these 14,340 participants at 2HC was 62.9 (9.0) years for men and 61.5 (9.0) years for women. Significant trends were observed for FFM and FFM% across quintiles of dietary vitamin E intake for men but only for FFM% in women. Adjustment for supplemental vitamin E did not modify the associations.

		Dietary vitamin E (mg α -tocopherol equivalents/day)						P trend
		Quintile 1		Quintile 3		Quintile 5		
		Mean	SD/SE	Mean	SD/SE	Mean	SD/SE	
MEN	<i>Vitamin E intake</i>	6.44	1.18	10.91	0.62	19.66	4.53	–
FFM (kg)	Model 1	61.25	0.09	61.86	0.09	61.75	0.09	0.005
FFM%	Model 1	76.41	0.14	76.73	0.13	77.02	0.14	0.002
WOMEN	<i>Vitamin E intake</i>	5.36	0.99	8.94	0.45	15.14	3.54	–
FFM (kg)	Model 1	40.48	0.08	40.69	0.07	40.60	0.08	0.78
FFM%	Model 1	60.46	0.20	60.89	0.18	61.47	0.19	<0.001

To our knowledge, this is the first time that a positive association between dietary vitamin E intake and FFM and FFM% has been observed in men and women in a UK population cohort. However, dietary vitamin E intake may be a marker of good dietary habits and the possibility of residual confounding cannot be excluded. Further work will investigate the association between circulating vitamin E concentrations and FFM, as well as FFM scaled for height; however these results indicate that further study into the potential protective role of vitamin E on FFM is warranted.

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