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Intakes and sources of vitamin K_1 in Irish teenagers aged 13–17 years

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Recent evidence suggests a role of vitamin K beyond its traditional role in blood coagulation[1]. An improved vitamin K status has been associated with an increase in childhood bone mineral content over time[2]. The European Food Safety Authority (EFSA) has found insufficient evidence to set an Estimated Average Requirement (EAR) for vitamin K but has set an Adequate Intake (AI) of 1·0μg/kg bodyweight per day for all age and gender populations for vitamin K_1 only based on observed intakes in healthy populations[3]. The objective of this analysis was to estimate the intake and sources of vitamin K_1 in Irish teenagers aged 13–17 years using data collected from the National Teens' Food Survey (NTFS) (www.iuna.net). A 7-day semi-weighed food record was used to estimate dietary intakes for 441 teenagers. The vitamin K_1 content of foods was primarily determined using data from the UK food composition tables (COFID)[4]. For certain foods where vitamin K_1 values were not available in COFID[4], data from the US food composition tables[5] and published papers were used to assign suitable values. The vitamin K_1 contents of composite dishes and retail products were calculated based on their ingredients. Body weight (kg) was measured in the participants' homes by trained researchers. Usual intakes of vitamin K_1 were calculated via the NCI-method[6] using SAS Enterprise Guide. Differences in vitamin K_1 intakes were assessed using a Kruskal-Wallis test (non-normal data) and a Wilcoxon two sample test for post-hoc analysis.

		Boys			Girls		
	Total population (*n* 441)	All ages (*n* 224)	13–14y (*n* 94)	15–17y (*n* 130)	All ages (*n* 217)	13–14y (*n* 94)	15–17y (*n* 123)
Contribution (%) of food groups to the mean daily intake of vitamin K_1 from food sources only							
Food Groups	%	%	%	%	%	%	%
Vegetables & vegetable dishes	32·3	31·2	33·9	29·2	33·5	32·4	34·4
Green vegetables	*14·6*	*15·0*	*18·1*	*12·8*	*14·2*	*15·5*	*13·3*
Salad vegetables	*5·9*	*4·8*	*4·4*	*5·0*	*7·1*	*5·6*	*8·2*
Other vegetables	*11·8*	*11·4*	*11·5*	*11·3*	*12·2*	*11·3*	*12·9*
Potatoes & potato products	16·9	16·7	17·0	16·5	17·1	17·9	16·5
Chipped, fried & roasted products	*14·1*	*13·6*	*13·6*	*13·6*	*14·6*	*15·6*	*13·8*
Other potatoes & potato products	*2·8*	*3·1*	*3·3*	*3·0*	*2·5*	*2·3*	*2·7*
Meat & meat products	13·2	14·5	12·9	15·6	12·0	13·5	10·8
Meat dishes	*5·4*	*6·1*	*5·0*	*6·9*	*4·7*	*4·9*	*4·5*
Meat products	*4·2*	*5·0*	*4·7*	*5·2*	*3·3*	*3·6*	*3·1*
Fresh meat & poultry	*3·7*	*3·4*	*3·2*	*3·5*	*4·0*	*5·1*	*3·2*
Butter, spreading fats & oils	8·4	9·3	9·7	9·0	7·6	7·9	7·4
Soups, sauces & miscellaneous foods	4·7	3·8	2·7	4·6	5·6	4·6	6·3
Sugars, confectionary & preserves	4·6	4·1	4·2	4·0	5·1	5·4	4·8
Fruit & tinned fruit	3·8	3·3	3·0	3·6	4·3	4·0	4·5
Milk & yogurt	3·1	3·8	4·0	3·8	2·4	2·2	2·5
Other food groups	12·9	13·3	12·6	13·8	12·5	12·0	12·9

The mean daily intake (MDI) of vitamin K_1 was 55 μg/d in the total population (boys; 60 μg/d, girls; 50 μg/d). Adjusted for bodyweight, the MDI was 1 ·0 μg/kg/d for boys aged 13–14 years and 0·9 μg/kg/d for boys aged 15–17 years and girls (all ages). Boys aged 13–14 years had significantly higher intakes (μg/kg/d) ($p < 0·001$) than all other age and gender groups. 'Vegetable and vegetable dishes' was the highest contributor to vitamin K_1 intakes in the total population at 32%, of which 15% came from 'green vegetables'. 'Potatoes & potato products', 'meat and meat products' and 'butter, spreading fats & oils' contributed 17, 13 and 8% of the MDI of vitamin K_1 in the total population, respectively. Vitamin K_1 intakes in Irish teenagers may be considered less than optimal as intakes are below observed AIs for each age/gender group examined with the exception of younger teenage boys. Further research is required to investigate the implications of lower vitamin K intakes in overall health.

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