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Intakes and sources of vitamin K₁ 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 K₁ only based on observed intakes in healthy populations⁽³⁾. The objective of this analysis was to estimate the intake and sources of vitamin K₁ 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 K₁ content of foods was primarily determined using data from the UK food composition tables (COFID)⁽⁴⁾. For certain foods where vitamin K₁ 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 K₁ 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 K₁ were calculated via the NCI-method⁽⁶⁾ using SAS Enterprise Guide. Differences in vitamin K₁ intakes were assessed using a Kruskal-Wallis test (non-normal data) and a Wilcoxon two sample test for post-hoc analysis.

	Total population (n 441)	Boys			Girls		
		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 K₁ 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 K₁ was 55 µg/d in the total population (boys; 60 µg/d, girls; 50 µg/d). Adjusted for body-weight, 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 K₁ 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 K₁ in the total population, respectively. Vitamin K₁ 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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