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Micronutrient intakes in a nationally representative sample of teenagers (13–18 years) in Ireland: prevalence of inadequate intakes and risk of excess

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The teenage years are a crucial period of growth and development during which sufficient micronutrient intakes are important to meet the requirements of the growing individual. The objective of this study was to estimate micronutrient intakes, the prevalence of inadequate intakes and risk of excessive intakes among teenagers in Ireland. Analyses were based on the National Teens' Food Survey II (NTFS II) (2019–20) of 13– 18-year-olds in the Republic of Ireland (n 428). Food and beverage intake data (including nutritional supplements) were collected using a 4-day weighed food record. Nutrient intakes were estimated using Nutritics$_{©}$. Based on UK and Irish food composition data and usual intakes of micronutrients were calculated via the NCI-method using SAS$_{©}$ Enterprise Guide. The prevalence of inadequate intakes of micronutrients (excluding energy under-reporters (46%) [(1)] was estimated using estimated average requirements (EARs) established by the US Institute of Medicine (IOM) (vitamin D) [(2)], the UK Department of Health (DOH) (thiamin, vitamin B_{12} and magnesium) [(3)] and the European Food Safety Authority (EFSA) (all other micronutrients) [(4)]. The risk of excessive intake was evaluated by comparing nutrient intakes to tolerable upper intake levels (ULs) established by the US Food and Nutrition Board (vitamin C and iron)[(5,6)] and EFSA (all other micronutrients)[(7)].Mean (±SD) intakes of micronutrients were estimated for vitamin A (635 ± 368μg), vitamin D (3.7 ± 3.0μg), vitamin E (8.5 ± 4.0mg), vitamin C (78.0 ± 57.9mg), thiamin (1.7 ± 0.8mg), riboflavin (1.8 ± 1.1mg), niacin (37.4 ± 12.3mg), vitamin B6 (1.9 ± 0.9mg), vitamin B_{12} (5.5 ± 2.7μg), dietary folate equivalents (DFE) (287 ± 107μg), calcium (812 ± 331mg), iron (11.0 ± 4.4mg), magnesium (236 ± 80mg) and zinc (8.4 ± 3.1mg). Significant proportions of teenagers had inadequate intakes of a number of micronutrients including vitamin D (94%), calcium (51%), zinc (48%), vitamin C (48%), magnesium (33%), vitamin A (31%), DFE (31%), riboflavin (20%) and vitamin B6 (14%), and 9% of teenage girls had inadequate intakes of iron. The proportion of teenagers with intakes exceeding the UL for retinol, vitamins D, E, C, B6, preformed niacin, calcium, iron and zinc was <0.5% however, a small proportion (4%) had folic acid intakes exceeding the UL. Important sources of vitamins and minerals were 'milk and milk products' (vitamins A, D, riboflavin and calcium), 'meat & meat dishes' (vitamins A and B6), 'breads and cereals', especially fortified breakfast cereals (B-vitamins, vitamin D, iron) and 'fruits and vegetables' (vitamins A and C).In summary, this study has shown that significant proportions of teenagers in Ireland have low intakes of key micronutrients with little risk of excessive intakes and highlights the need for targeted dietary strategies to address these low intakes among this population group.

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