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Micronutrient intakes and inadequacies in school-going Irish adolescents

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The period of adolescence is one of rapid growth and development, and optimal dietary intake during the teenage years is vital. The demand for energy and most nutrients is high, and adolescents gain approximately 15% of their final adult height and about 45% of the maximal skeletal mass[1]. Adolescents' intakes of fat and added sugars exceed guideline amounts in many countries, while intakes of micronutrients, most notably Fe and Ca, do not meet the recommendations, particularly in girls[2]. Boys' and girls' nutrient requirements differ, with boys needing more energy and protein and girls' Fe requirements being higher because of menstruation. The National Diet and Nutrition Survey reported in 2003 that 44% of adolescent girls aged 11–18 years had low Fe intakes (below the lower reference nutrient intake (RNI) for Fe)[3]. A longitudinal study over three school years of changes in dietary intake was carried out annually from 2005 to 2007 inclusive in three secondary schools in County Cork, Republic of Ireland. A 3 d weighed dietary record was used to collect food intake from 158 students aged 12–17 years in 2005 (ninety-seven females, sixty-one males). Analysis of dietary intake data was determined using WISP© (Tinuviel Software, Llanfechell, Anglesey, UK), which is based on *McCance and Widdowson's The Composition of Foods Sixth Edition*[4]. Mean daily intakes of five essential micronutrients are reported (Table). Mean daily Ca (mg) and folate (μg) intakes were significantly higher in males ($P<0.05$). The males in this group also had significantly higher intakes of Fe and riboflavin compared with the females ($P<0.001$).

	Total group (*n* 158)		Males (*n* 61)		Females (*n* 97)	
Micronutrient	Mean	SD	Mean	SD	Mean	SD
Ca(mg)	899	480	1078*	629	786	311
Fe (mg)	11.0	5.0	13.0**	5.9	9.7	3.7
Folate (μg)	235	128	287*	169	203	77
Riboflavin(mg)	1.8	1.1	2.3**	1.4	1.5	0.7
Vitamin C (mg)	81.4	54.2	82.5	60	80.7	50.6

Values were significantly different between genders: *$P<0.05$, **$P<0.001$.

A substantially high percentage of females (91%) had Fe intakes that did not meet the UK RNI[5] compared with males (46%). Over half females (57%) and males (54%) in this cohort had Ca intakes below the UK RNI for Ca. In contrast only 20% of males and 22% of females had vitamin C intakes below the UK RNI. Males had relatively good intakes of Ca, Fe, folate, riboflavin and vitamin C. Average daily intakes of Ca and Fe for females were (786 mg) and (9.7 mg) respectively. These findings suggest that Ca and Fe intakes in Irish adolescent girls are below the recommended amounts. Continuously low intakes of these nutrients, particularly Fe, may led to suboptimal Fe status and anaemia in Irish teenage girls.

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