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Vitamin D intakes and dietary sources in children aged 2 yrs in the Cork BASELINE Birth Cohort Study

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The US Institutes of Medicine estimated average requirement (EAR) for vitamin D is 10 μg/d (400 IU/d) for children above one year[(1)]. We have reported vitamin D intakes in Irish children (aged 5–12 yrs) and adolescents (aged 13–17 yrs) that are substantially below the EAR[(2)]. The current analysis aimed to estimate intakes, prevalence of inadequate intakes, and dietary sources of vitamin D in younger children in Ireland.

Food consumption data for this analysis was collected in the form of a two-day weighed food diary from participants of the Cork BASELINE Birth Cohort Study at their 24-month follow-up. One hundred and thirty seven food diaries were collected and analysed using updated food consumption data for vitamin D from international sources to reflect currently available analytical data[(2)]. Values for nutritional supplements and brand-level foods were updated based on current market data and from the Irish Food Composition Database[(3)].

The mean daily intake (MDI) of vitamin D from all sources in the total study population was 3.8 μg and almost everyone (94%) had intakes below the EAR of 10 μg/d. 'Growing-up milk' was an important source of vitamin D among 2-year olds, and contributed 61% to total intakes of 7.6 μg/d among consumers. Fortified milk and yogurts, nutritional supplements and breakfast cereals were important sources of vitamin D, see table. Intakes from the base diet were low; with actual contributions from meat, fish, eggs, and non-fortified milk and yogurts ranging from 0.1 to 0.4 μg/d, regardless of supplement use or fortified food consumption. The prevalence of vitamin D-containing supplement use was <10% and the mean intake of vitamin D in supplement users was 9.2 μg/d; 67% had intakes below the EAR. Non-users of vitamin D-containing supplements who consumed vitamin D fortified foods had an intake of 3.9 μg compared with 1.2 μg in those who did not use supplements and did not consume fortified foods.

	Total population (n = 137)		Supplement users, fortified food consumers (n = 107)		Growing-up milk consumers (n = 31)		Supplement users (n = 12)		Non users of supplements or fortified foods (n = 30)	
Food Group	%	μg\d	%	μg\d	%	μg\d	%	μg\d	%	μg\d
Growing-Up Milk	28	1.0	30	1.3	61	4.6	17	1.6	0	0.0
Vitamin D fortified milk and yogurts	19	0.7	20	0.9	6	0.5	19	1.7	0	0.0
Breakfast cereals	10	0.4	10	0.5	6	0.5	9	0.8	6	0.1
Nutritional Supplements	9	0.4	10	0.5	11	0.8	45	4.1	0	0.0
Non-fortified milk and yogurts	9	0.3	7	0.3	3	0.2	1	0.1	30	0.4
Fish and fish dishes	6	0.2	5	0.2	3	0.2	3	0.3	7	0.1
Meat and meat products	8	0.3	6	0.3	3	0.2	3	0.2	23	0.3
Eggs and egg dishes	4	0.2	3	0.1	2	0.2	1	0.0	23	0.3
Butter and fat spread	3	0.1	3	0.1	2	0.2	1	0.1	3	0.03
Other	4	0.2	4	0.2	3	0.2	1	0.1	7	0.1
Mean daily intake vitamin D (ug/d)	**3.8**		**4.5**		**7.6**		**9.2**		**1.2**	

Results show that despite consumption of fortified foods among 78% of the study population, the current supply of vitamin D in the diets of toddlers living in Ireland is unable to deliver vitamin D at the recommended levels. The impact of these relatively low intakes of vitamin D on serum 25-hydroxyvitamin D levels in this population is currently under investigation.

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