

Summer Meeting hosted by the Irish Section, 16–19 July 2012, Translational nutrition: integrating research, practice and policy

Vitamin intakes in Irish pre-school children aged 1–4 years

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Early childhood is a critical time when dietary intake patterns are forming, which may impact on health in later life. The objective of this analysis was to estimate the mean daily vitamin intake of Irish pre-school children and was based on the National Pre-school Nutrition Survey (2010–2011), which was carried out to establish a database of habitual food and drink consumption in a representative sample of Irish pre-school children aged 1–4 years. A 4 day weighed food record was used to collect food intake data of 500 pre-school children. Analysis of dietary intake data was carried out using WISP[®] (Tinuviel Software, Anglesey, UK), which contains *McCance and Widdowson's The Composition of Foods*⁽¹⁾ and the Irish Foods Composition Database⁽²⁾.

The mean intake of selected vitamins and the percentage with intakes below the estimated average requirement (EAR)⁽³⁾, excluding under-reporters, are shown in Table 1. BMR was calculated using standard equations⁽⁴⁾ and cut-off points, calculated as multiples of BMR⁽⁵⁾, were used to identify under-reporters (URs).

Table 1.

	1 year olds (n = 109)			2 year olds (n = 93)			3 year olds (n = 81)			4 year olds (n = 96)		
	Mean	SD	% < EAR	Mean	SD	% < EAR	Mean	SD	% < EAR	Mean	SD	% < EAR
Vitamin A (µg)	787	497	4.6	639	354	20.4	712	398	14.8	632	345	13.5
Vitamin D (µg)	4.4	5.5	–	3.3	3.3	–	3.2	3.3	–	3.0	2.6	–
Thiamin (mg)	1.0	0.4	0.0	1.2	0.4	0.0	1.1	0.3	0.0	1.2	0.3	0.0
Riboflavin (mg)	1.7	0.7	0.0	1.7	0.6	0.0	1.6	0.5	0.0	1.6	0.5	0.0
Total Niacin (mg)	18.1	5.6	0.0	21.9	6.0	0.0	22.2	5.8	0.0	23.0	6.3	0.0
Vitamin B6 (mg)	1.3	0.6	0.0	1.5	0.6	0.0	1.6	0.5	0.0	1.6	0.6	0.0
Vitamin B12 (µg)	4.3	2.0	0.0	4.5	2.3	0.0	4.1	1.8	0.0	4.0	1.6	0.0
Total folate (µg)	165	81	0.0	186	68	0.0	199	88	0.0	198	81	0.0
Vitamin C (mg)	80	45	0.0	87	68	2.2	87	48	1.2	96	53	1.0

The main food contributors to vitamin intakes and their % contribution are shown below.

Table 2.

Vitamin A	Milk & Yogurt, 27%; Vegetables & Vegetable dishes, 25%; Meat and Meat Products, 12%
Vitamin D	Milk & Yogurt, 30%; Meat & Meat Products, 17%; Nutritional Supplements, 10%
Thiamin	Breakfast Cereals, 24%; Milk & Yogurt, 17%; Meat and Meat Products, 13%
Riboflavin	Milk & Yogurt, 47%; Breakfast Cereals, 20%; Meat & Meat Products, 7%
Total Niacin	Meat & Meat Products, 25%; Breakfast Cereals, 18%; Milk & Yogurt 16%
Vitamin B6	Breakfast Cereals, 17%; Meat & Meat Products, 16%; Milk & Yogurt, 16%
Vitamin B12	Milk & Yogurt, 58%; Meat & Meat Products, 13%; Breakfast Cereals, 7%
Folate	Milk & Yogurt, 24%; Breakfast Cereals, 21%; Fruit & Fruit Juices, 12%
Vitamin C	Fruit & Fruit Juices, 43%; Milk & Yogurt, 16%; Beverages, 10%

Intakes of most vitamins in the Irish pre-school population are adequate, with the exception of vitamins A and D. Over 78% of 1–4 year olds had vitamin D intakes less than 5 µg/d and 20% had intakes less than 1 µg/d. “Milk & Yogurt”, “Breakfast cereals”, “Vegetables & vegetable dishes”, “Fruit & fruit juices”, “Meat and Meat Products” and “Beverages” were found to be the largest food contributors to selected vitamins in Irish pre-school children.

The project was funded by the Irish Government under the Food for Health Research Initiative 2007–2012.

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