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

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It is well established that nutrition in infancy and childhood is fundamental for future health status. The objective of the study was to estimate mineral intakes and the contribution of different food groups to mineral intakes in Irish pre-school children and was based on the Nation 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 from 500 pre-school children. Analysis of dietary intake data was carried out using WISP[®] (Tinuviel Software, Anglesey, UK), which is based on *McCance and Widdowson's The Composition of Foods, Sixth Edition*⁽¹⁾ and the Irish Food Composition Database⁽²⁾. For selected minerals, the mean daily intake and the percentage of individuals with intakes less than the UK estimated average requirement (EAR)⁽³⁾ are reported. Under-reporters were excluded from the analysis. Minimum energy intake cut-off points⁽⁴⁾ (Torun *et al.* 1996), calculated as multiples of BMR⁽⁵⁾ (Schofield *et al.* 1985) were used to identify under-reporters.

Minerals	1 year olds (n = 107)			2 year olds (n = 91)			3 year olds (n = 81)			4 year olds (n = 95)		
	Mean	SD	% < EAR	Mean	SD	% < EAR	Mean	SD	% < EAR	Mean	SD	% < EAR
Calcium(mg)	878	294	0.0	840	281	0.0	795	281	0.0	785	222	0.0
Iron(mg)	7.4	3.0	23.4	7.9	2.9	9.9	7.7	4.1	11.1	8.1	2.7	0.0
Magnesium(mg)	150	36	0.0	167	40	0.0	166	35	0.0	174	44	0.0
Zinc(mg)	5.6	1.7	8.4	5.8	1.9	13.2	5.6	1.8	12.3	5.6	1.4	38.9
Copper(mg)	0.6	0.3	n/a	0.7	0.3	n/a	0.8	0.4	n/a	0.8	0.3	n/a
Phosphorus(mg)	848	225	n/a	909	249	n/a	885	219	n/a	908	203	n/a
Potassium(mg)	1790	410	n/a	1858	440	n/a	1866	384	n/a	1895	371	n/a

The key sources of selected minerals are shown in the table below.

Minerals	Main food groups and their percentage contribution
Calcium (mg)	Milk & yoghurt, 53%; bread & rolls, 10%; breakfast cereals, 8%
Iron (mg)	Breakfast cereals, 31%; bread & rolls, 13%; meat & meat products, 11%
Magnesium (mg)	Milk & yoghurt, 25%; fruit & fruit juices, 15%; breakfast cereals, 12%
Zinc (mg)	Milk & yoghurt, 31%; meat & meat products, 23%; bread & rolls, 9%
Copper (mg)	Fruit & fruit juices, 25%; meat & meat products, 13%; bread & rolls, 12%
Phosphorus (mg)	Milk & yoghurt, 38%; meat & meat products, 15%; breakfast cereals, 8%
Potassium (mg)	Milk & yoghurt, 29%; fruit & fruit juices, 21%; meat & meat products, 13%

Intakes of selected minerals in 1–4 year old Irish children are generally adequate with the exception of iron and zinc. Iron intakes were below the EAR for almost a quarter of 1 year olds. Zinc intakes were also seen to be below the EAR particularly in 4 year olds. “Milk & Yoghurt”, “Breakfast Cereals”, “Meat & Meat Products”, “Fruit & Fruit Juices” and “Bread & Rolls” are the main contributors to mineral intakes in Irish pre-school children.

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1. Food Standards Agency. *McCance & Widdowson's The Composition of Foods Sixth Edition including supplemental volumes*. Cambridge: Royal Society of Chemistry; 2002.
2. Black LJ, Ireland J, Moller A, Roe M, Walton J, Flynn A *et al.* (2011) Development of an on-line Irish food composition database for nutrients. *J. Food Compos. Anal.* **24**(7): 1017–1023.
3. Department of Health UK. *Dietary Reference Values for Food Energy and Nutrients for the United Kingdom*. No. 41. London: H.M. Stationary Office; 1991.
4. Torun B, Davies PSW, Livingstone MBE, Paolisso M, Sackett R & Spurr GB (1996) Energy requirements and dietary recommendations for children and adolescents 1 to 18 years old. *Eur. J. Clin. Nutr.* **50**, S37–S81.
5. Schofield WN (1985) Predicting basal metabolic rate, new standards and review of previous work. *Hum. Nutr. Clin. Nutr.* **39C**, Suppl 1; 5–41.