

## Dietary patterns of 24-month old children and associated nutrient intakes and body weight status

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Dietary pattern analysis is a useful method to describe the whole diet and evaluate associations with health outcomes and can complement traditional methodologies which use individual foods or nutrients<sup>(1)</sup>. There are few dietary pattern studies in young children.

We aimed to identify the dietary patterns of young children living in Ireland, and investigate associations with body weight status and nutrient intakes and status. Cross-sectional food consumption data of 24-month old children participating in the Cork BASELINE Birth Cohort Study<sup>(2)</sup> were collected using a 2-day weighed food record (n = 468). K-means clustering was conducted to identify predominant dietary patterns on the basis of the % contribution of food groups to total energy intake (%TE). Body weight status<sup>(3)</sup>, adequacy of nutrient intake and biomarkers of vitamin D and iron status were compared across the dietary pattern groups.

Four dietary pattern clusters were derived from this analysis, two of which differed principally by the type and volume of milk a child consumed, namely “Cows’ milk” [median (IQR): 495 (178) ml/d; 32 %TE] and “Formula” [median (IQR): 368 (193) ml/d; 23 % TE]. A “Traditional” pattern, characterised by higher intakes of wholemeal breads, butter and fat spreads, fresh meat and fruit, with lower intakes of processed meat, and a “Convenience” pattern, characterised by higher intakes of sweets, confectionary and cakes (15 %TE), processed meat, convenience foods (pizza, spaghetti hoops, instant noodles) and lower intakes of fresh meat, were identified.

Overall, 7 % of children were classified as obese (>98<sup>th</sup> centile); however, no significant associations between dietary patterns and body weight ( $p = 0.121$ ), height ( $p = 0.327$ ) or body weight status (>98<sup>th</sup> centile:  $p = 0.328$ ; BMI z-score:  $p = 0.170$ ) at 24 months were observed.

% of children meeting dietary reference values (DRV) for macro- and micro-nutrients (excluding under-reporters of energy intake) across dietary pattern groups		Cows’ milk (n = 160)	Formula (n = 55)	Convenience (n = 116)	Traditional (n = 137)	P
	<b>Requirement</b>					
Total fat	20–45 %TE <sup>(4)</sup>	71.9	89.1	80.2	95.6	<0.001
Total carbohydrate	45–60 %TE <sup>(5)</sup>	90.6	80.0	74.1	83.2	0.004
Free sugar	<10 %TE <sup>(6)</sup>	61.9	52.7	31.0	54.7	<0.001
Dietary fibre	>2 g/MJ <sup>(5)</sup>	56.9	65.5	65.5	85.5	<0.001

Compliance with EFSA total fat<sup>(4)</sup> and dietary fibre<sup>(5)</sup> DRVs was lowest in the “Cows’ milk” group and the “Convenience” group had lower compliance with the WHO DRV for free sugars<sup>(6)</sup>. All groups meet the EFSA protein DRV<sup>(7)</sup>. Due to fortification, the “Formula” group had higher intakes of vitamin D (8.2 vs 2.0 µg/d), iron (10.4 vs 6.3 mg/d), vitamin C (109 vs 71 mg/d) and zinc (6.7 vs 5.1 mg/d) than the other groups, and had higher serum 25-hydroxyvitamin D concentrations (76.7 vs 61.9 nmol/L) and iron stores, as determined by CRP-corrected serum ferritin concentrations (26.4 vs 23.7 µg/L).

In conclusion, few foods differentiated the children in this study, highlighting the homogeneity in dietary patterns in toddlers. This analysis, in a highly educated and motivated cohort, emphasises deficits in the toddler diet and the urgent need for evidence-based dietary recommendations for appropriate feeding in young children.

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