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Prospective observation of energy intake from birth to 1 year

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No study has recorded and analysed what an infant consumes prospectively from birth until they reach 1 year of age with the use of food diaries since such a methodology is costly and can cause low respondent rates^(1,2). Such prospective data was collected for infants enrolled into the UK birth cohort of EuroPrevall (a multicentre research project funded by the EU looking into allergy)⁽³⁾ and was analysed to assess whether intake of macro- and micronutrients increased month on month and whether any difference in intake between the time points analysed was significant.

Enrolled infants had food diary records kept for their first year of life. Food diaries were completed and returned to the study office every 4 weeks. The fourth week of each diary contained quantitative data to allow detailed dietary analysis of intake and it was this data that was used in this work. Diaries were analysed using the dietary analysis program ‘Comp-Eat’ (Nutrition Systems) which had been modified to include nutritional data for all formula milks and baby food products recorded in the food diaries. Using available literature^(1,4), breast milk volumes were assigned based on the child’s age in months and the total amount of other milks reported (infant formula, cow’s milk).

A complete set of diaries (thirteen) were analysed for twenty-five infants (325 diaries in total). Mean percentage weight increase for these infants at 12 months of age was 312%. Our data shows that energy intake does increase significantly over the infants first year ($P < 0.000$), there is a month on month increase in intake and this increase is significant between the ages of 0–4 weeks, 4–8 weeks, 20–24 weeks, 24–28 weeks and 36–40 weeks. Similar findings were seen for protein, fat, carbohydrate, Ca, Fe, Se, Zn and vitamins A, C and E.

Age (weeks)	Number of infants receiving breast milk at time point (%)	Number of infants exclusively breast fed at time point (%)	Mean energy intake (kJ/d)	Change in daily energy intake per period (kJ)	Standard deviation	EAR (kJ/d)
4	22 (88)	14 (56)	2100.36*	133.88	47.48	2154.76–2280.28
8	18 (72)	10 (40)	2234.25*	200.83	67.66	2154.76–2280.28
12	17 (68)	7 (28)	2435.08	276.14	75.39	2154.76–2280.28
16	12 (48)	3 (12)	2585.71	104.6	96.97	2698.68–2886.96
20	7 (28)	2 (8)	2690.31	171.54	75.57	2698.68–2886.96
24	5 (20)	1 (4)	2861.85*	317.98	98.80	2698.68–2886.96
28	4 (16)	1 (4)	3179.84*	397.48	115.42	3200.76–3451.8
32	4 (16)	0	3577.32	225.93	106.75	3200.76–3451.8
36	3 (12)	0	3803.25	25.10	179.84	3200.76–3451.8
40	3 (12)	0	3828.36*	251.04	118.67	3619.16–3849.28
44	3 (12)	0	4079.4	33.47	172.93	3619.16–3849.28
48	3 (12)	0	4112.87	33.47	126.86	3619.16–3849.28
52	2 (8)	0	4200.73	87.86	141.17	3619.16–3849.28

Mean values were significantly different between this time point and the previous time point (RM ANOVA): * $P < 0.05$.

These results suggest that Estimated Average Requirement’s and Reference Nutrient Intakes for infants aged between 0 and 1 year would be better expressed as monthly values since intakes increase month on month in the first year of life and grouping these values limits their accuracy.

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