

Summer Meeting, 28 June–1 July 2010, Nutrition and health: cell to community

Relative validity of two food-frequency questionnaires for children compared with 4-day diet diaries

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The aim of the present study is to assess the relative validity of a parent-completed 140-item semi-quantitative FFQ for children aged 3–11 years (Scottish Collaborative Group (SCG) version C2) and a self-completed 146-item FFQ for children aged 12–16 years (SCG version C3) compared with 4-day non-weighed-diet diaries. Children who took part in the study were a sub-sample from the nation-wide Survey of sugar intake among children in Scotland⁽¹⁾. One hundred and fifty eight children completed both an FFQ and a 4-day diary. Nutrient intakes were calculated using the NDNS databank. FFQ with energy intakes below the 2.5 and above the 97.5 centiles were excluded from the analysis to remove outliers (six subjects). Nutrient intakes were energy adjusted and relative agreement was assessed using Spearman rank correlation coefficients and cross-classification of the percentage of subjects in the same and opposite thirds of intake.

	Intake				P for difference	Spearman rank correlation		Percentage agreement	
	FFQ		Diet diary			r _s	P	Same thirds	Opposite thirds
	Median	IQR	Median	IQR					
Version C2 (n 96)									
Energy (MJ/d)	7.32	6.33–8.98	6.24	5.42–7.24	<0.001	0.21	0.037	45.8	16.7
Fat % energy	32	30–35	34	30–37	0.011	0.46	<0.001	43.8	10.4
SFA % energy	13	12–15	14	13–16	0.009	0.52	<0.001	51	9.4
NMES % energy	15	13–19	14	11–19	0.063	0.36	<0.001	39.6	12.5
NSP (g/d)	13	10–16	10	8–11	<0.001	0.55	<0.001	58.3	12.5
Vitamin D (µg/d)	1.3	0.9–2.0	1.6	1.1–2.2	0.162	0.29	0.004	38.5	11.5
Vitamin C (mg/d)	151	111–215	80	49–129	<0.001	0.32	0.001	41.7	12.5
Vitamin E (mg/d)	7.4	5.8–8.9	6.8	5.4–7.9	0.002	0.29	0.005	41.7	14.6
Vitamin A (µg/d)	600	467–803	477	335–606	<0.001	0.45	<0.001	46.9	9.4
Fe (mg/d)	9.6	7.7–11.0	7.7	6.5–9.4	<0.001	0.48	<0.001	53.1	9.4
Ca (mg/d)	1009	800–1268	841	684–983	<0.001	0.47	<0.001	52.1	6.3
Folate (µg/d)	257	224–313	174	144–206	<0.001	0.56	<0.001	51	7.3
Version C3 (n 56)									
Energy (MJ/d)	7.63	6.12–10.34	7.29	6.17–9.17	0.357	0.12	0.397	44.6	12.5
Fat % energy	34	32–37	33	31–37	0.304	0.2	0.131	44.6	12.5
SFA % energy	15	13–16	14	12–16	0.186	0.35	0.008	48.2	8.9
NMES % energy	18	14–21	16	11–21	0.401	0.34	0.011	39.3	10.7
NSP (g/d)	12	9–17	11	9–13	0.005	0.45	<0.001	46.4	10.7
Vitamin D (µg/d)	1.3	0.8–2.3	1.6	1.2–2.2	0.014	0.27	0.046	42.9	14.3
Vitamin C (mg/d)	123	91–192	98	53–153	0.01	0.19	0.16	42.9	14.3
Vitamin E (mg/d)	7.5	5.7–10.8	7.4	5.5–10.0	0.285	0.24	0.074	39.3	10.7
Vitamin A (µg/d)	580	416–939	515	362–725	0.075	0.32	0.015	39.3	14.3
Fe (mg/d)	9.1	6.8–12.8	9.4	7.6–11.9	0.757	0.3	0.025	41.1	12.5
Ca (mg/d)	1039	710–1402	925	653–1189	0.195	0.3	0.025	46.4	14.3
Folate (µg/d)	255	174–328	191	154–241	0.001	0.42	0.001	51.8	8.9

IQR, interquartile range.

Differences between the FFQ and diary for absolute nutrient intakes tended to be larger for version C2 than C3. However, for C2 Spearman rank correlation coefficients were significant ($P < 0.05$) for all nutrients but for C3 correlation coefficients were significant for all nutrients except energy, total fat (% energy) and vitamins C and E. The percentage of subjects classified in the same thirds was > 50 for SFA (% energy), NSP, Fe, Ca and folate for C2 and folate for C3. The percentage of subjects classified in opposite thirds was < 10 for SFA (% energy), vitamin A, Fe, Ca and folate for C2 and SFA (% energy) and folate for C3. Although the ranking agreement was better in younger children, absolute intakes agreed better between the two methods for older children.

The study was funded by the Food Standards Agency Scotland.

1. Sheehy C, McNeill G, Masson L *et al.* (2008) Survey of sugar intake among children in Scotland. Food Standards Agency Scotland. <http://www.food.gov.uk/scotland/scotnut/scotsug>