Proceedings of the Nutrition Society (2008), **67 (OCE8)**, E328 doi:10.1017/S0029665108000025

Summer Meeting 30 June–3 July 2008

Seasonal comparison of energy and nutrient intakes from food diaries completed for a longitudinal study

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The current gold standard for estimating dietary intakes is the 7 d weighed-food record[(1)]. There is increasing use of food diaries that use estimated portion sizes, which avoids subjects having to weigh every food they consume. However, food-diary completion is still burdensome to the individual, and time-consuming and expensive to analyse. Consequently, there is a paucity of information on the reproducibility and/or seasonal variation in nutrient intake calculated from estimated food diaries. The aim of the present study was to examine the variation in nutrient intake, reported by post-menopausal women, at 3-monthly intervals over a single year.

As part of a longitudinal study examining the role of diet and sunlight on vitamin D status, 357 post-menopausal women (age range 58–65 years) attended visits and were requested to complete food records, based on the EPIC[(2)] food diary, in summer and autumn 2006, winter 2006–7 and spring 2007. The food diaries were analysed for nutrient content using WinDiets (Robert Gordon University, Aberdeen).

For the first three visits the majority of women completed diaries for 7 d; however, by the last visit (in spring 2007) more than half the subjects only completed 4 d diaries (including one weekend day). The average daily energy and nutrient intakes according to season are shown in the Table. Throughout the study, the ratio of mean energy intake (EI) to basal metabolic rate (BMR) remained above 1.40.

	Summer 2006 (*n* 336)		Autumn 2006 (*n* 316)		Winter 2006–7 (*n* 315)		Spring 2007 (*n* 306)		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	*P**
Energy (MJ)	6.9	1.6	6.9	1.5	7.0	1.5	6.9	1.5	0.393
EI:BMR	1.42	0.36	1.40	0.32	1.43	0.34	1.41	0.34	0.281
Fat (g)	63	20	63	18	65	20	64	20	0.276
Carbohydrate (g)	197	52	194	50	199	50	197	51	0.562
Protein (g)	69	15	68	14	69	14	68	14	0.379
Vitamin C (mg)	118	66	94	58	92	51	102	64	<0.001
Vitamin E (mg)	7.5	3.3	7.0	2.8	7.0	2.7	7.1	2.9	0.006
Vitamin D (μg)	2.9	2.3	2.6	1.7	2.8	1.9	2.9	2.1	0.012
Folate (μg)	224	67	217	63	214	63	227	70	<0.001
Ca (mg)	775	236	772	227	763	230	806	232	0.003
Fe (mg)	10.7	3.6	10.4	3.3	10.4	3.2	10.2	3.3	0.048
Mg (mg)	249	69	242	62	246	64	245	65	0.040

*Significance by repeated measures of log transformed variables (where required) [*n* 285].

There appeared to be a statistically significant seasonal variation in dietary intakes of some nutrients. Vitamin C and folate intakes were highest in summer 2006 and spring 2007 and lowest in winter 2006–7, possibly reflecting higher intakes of salads and fruit in the summer and spring. At present, there is no explanation for the vitamin D nadir in autumn or why Ca intakes should be highest in spring.

Further evaluation of seasonal variations in nutrient intakes is required. Nevertheless, any differences in nutrient intakes between the seasons appear to be small and may be negligible for the purposes of examining diet and health outcomes.

This work was funded by the Food Standards Agency. Any views expressed are the authors' own.

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