

## IS ONE REPLICATE ENOUGH TO RELIABLY ESTIMATE THE POPULATION VARIANCE RATIO?

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The major limitation to the use of one-day-intake data for estimating the prevalence of intakes above and below set criteria, such as the Recommended Dietary Intakes for use in Australia (NHMRC 1991), is the existence of within-person or intraindividual variation in dietary intake. The error that has frequently been made when interpreting the data from the 1983 National Dietary Survey of Adults (DCSH 1987) is to assume that the observed distribution of intake represents the 'usual' distribution of intake in the population. This assumption leads to overestimation of both the prevalence of inadequate and excess intakes. If reliable information on the ratio of within-person to between-person variance (VR) in intake is available it is possible, however, to 'adjust' the observed distribution of intake to take this into account (Sempos et al. 1991). It is proposed to use this approach in the 1995 National Health and Nutrition Survey by collecting two days of information from a ten percent sub-sample.

There is little information in the literature to assess how well a single replicate obtained after a short interval of time estimates the true population variance ratio. The data in the table below address this question by comparing, for selected nutrients, the VR obtained in 225 adults from 12 days of dietary information over the course of a year and from two non-adjacent days in the same week, as is likely to be the case in the 1995 National Health and Nutrition Survey.

The data suggest that a single replicate obtained within the same week will give either a comparable or somewhat conservative estimate of VR except for beta-carotene in males and retinol, iron and zinc in females. For these nutrients the VR assessed from only a single replicate appears to overestimate that likely to exist in the longer term.

Nutrient	98 Males 18-62 years		127 Females 18-62 years	
	12d	2d	12d	2d
Energy	1.8	1.0	2.0	1.6
Calcium	1.3	1.3	1.6	0.9
Thiamin	1.0	0.8	1.6	2.0
Retinol	2.9	2.9	3.9	6.8
Beta-carotene	3.2	4.8	4.1	4.2
Iron	1.0	0.9	1.8	2.9
Zinc	3.3	2.5	5.0	6.6

DEPARTMENT OF COMMUNITY SERVICES AND HEALTH (1987). 'National dietary survey of adults:1983' No.2 Nutrient intakes (AGPS: Canberra)  
 SEMPOS, C.T., LOOKER, A.C., JOHNSON, C.L. and WOTEKI, C.E. (1991). In 'Monitoring Dietary Intakes', ILSI Monographs, p.99, ed I. Macdonald  
 NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL (1991). 'Recommended Dietary Intakes for Use in Australia' (AGPS: Canberra)