Visual plate waste assessment in the institutionalised elderly

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A food intake assessment tool was tested in the institutionalised elderly. Menu analysis yields nutrient data but not how much of that food is eaten. Thus a simple, accurate method is needed to assess plate waste in this group to calculate total nutrient intake. Visual assessment is less time consuming than weighing and has been validated in schoolchildren (1) but not the elderly. We measured waste in 17 Melbourne nursing home residents, 11 male, six female, one sex not recorded, aged 83.0(6.9) [mean(SD)] by both visual estimation and weight. Visual estimation was performed by two observers independently, using a seven point scale from all waste to no waste before each component of the meal was weighed (W). Visual assessment and sample weight were used to calculate waste (g) for observers 1 and 2 (V1,V2). Results presented represent food served to the resident which could be assessed by all three methods.

Food	N	Waste (g) mean ± SEM			Pearson's R correlation, P<0.005			
		V1	V2	W	V1 vs V2	W vs V1	W vs V2	W vs V12
silverside	13	37.6 ± 9.7	24.0 ± 7.1*	26.9 ± 7.2#	0.78	0.92	0.83	0.93
cabbage	15	16.9 ± 4.3	15.6 ± 4.8	15.0 ± 4.2	0.81	0.80	0.83	0.86
carrot	13	11.7 ± 4.6	11.7 ± 5.4	9.8 ± 4.0	0.98	0.97	0.93	0.95
chat potato	11	28.3 ± 9.9	31.3 ± 10.3	28.7 ± 8.6	0.86	0.83	0.97	0.94
custard	11	3.6 ± 1.9	1.8 ± 1.2	7.1 ± 4.2	0.86	0.86	0.99	0.95
peach sponge	10	8.9 ± 4.5	11.8 ± 6.5	21.4 ± 11.0	0.92	0.99	0.94	0.98

*V1 vs V2, P<0.05   #V1 vs W, P<0.05

Results were analysed using paired t-test and Pearson's R correlation on SPSS for windows. V1 was compared with V2. V1, V2 and the mean of V1 and V2 (V12) were each compared with W. The t-tests showed no significant differences except for silverside (V1 vs V2 and V1 vs W, see table). Strong correlations (table) are expected between two measures of the same item.
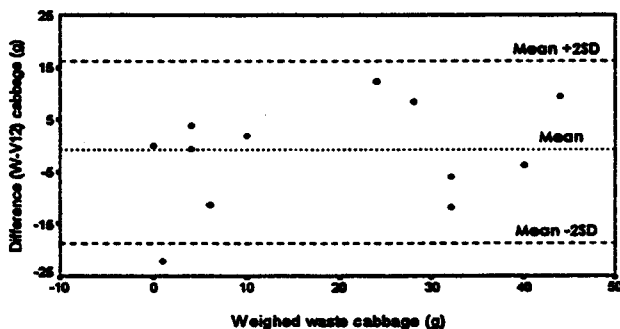

Weighed waste cabbage (g)

Figure. A plot of difference (W-V12) against estimated true value (W) (2) indicated that most individual items' differences were within 2 SD of that item's mean difference, eg cabbage. However, at higher waste V12 underestimated custard and peach sponge and was more variable for silverside.

Visual plate waste has the potential to assess the intake of the institutionalised elderly but requires careful training to reduce intra-observer error and techniques need to be refined for certain foods.

1. Comstock EM, St Pierre RG, Mackiernan YD. Measuring individual plate waste in school lunches. J Am Dietet A 1981;79:290-6.
2. Bland JM, Altman DG. Statistical methods for assessing agreement between two methods of clinical measurement. Lancet 1986;ii:307-10.