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Development and validation of a dish composition database for estimating food group and nutrient intake in Japan

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Although standard recipe data are often used for dietary assessment[1,2], few studies have reported the validity of dietary intake estimated based on a dish composition database (DCD)[3]. We therefore developed DCD based on data from weighed dietary record (DR) and assessed the relative validity of food group and nutrient intake estimated by the DCD using the food composition database (FCD) as a reference.

The DCD were developed using 16-d DR collected from 252 Japanese adults aged 31–81 y in 2002. A total of 2409 dishes reported in the 16-d DR were aggregated into 128 dish codes. We calculated the mean food group and nutrient content of the dish for each code to generate the DCD. The validity of the DCD was examined using different dietary data (4-d DR in 392 Japanese adults aged 20–69 y in 2013). After coding each dish in the 4-d DR with the dish codes, dietary intake of the participants was calculated using the DCD. These estimated values were compared with those estimated using the standard FCD of Japan[4].

There were significant differences in median intakes between the DCD and the FCD for 18 and 20 (of 26) food groups and 29 and 22 (of 43) nutrients (including energy) in men and women, respectively. The median Spearman's correlation coefficients between intakes estimated by the FCD and by the DCD were 0·60 for food groups and 0·60 for nutrients in men (Table 1). The respective values in women were 0·57 and 0·53. When portion size data reported by the participants were used instead of standard portion size data, the median correlation coefficients for food groups and for nutrients were respectively, 0·73 and 0·75 in men and 0·72 and 0·71 in women.

Table 1. Spearman's correlation coefficients between intakes estimated based on the FCD (reference method) and those estimated based on the DCD with the use of standard portion size data or of reported portion size data.

	Men (n 196)		Women (n 196)	
	Standard portion size	Reported portion size	Standard portion size	Reported portion size
Food groups (n 26)				
Minimum	0·19	0·23	0·20	0·35
25th percentile	0·41	0·49	0·42	0·51
Median	0·60	0·73	0·57	0·72
75th percentile	0·76	0·86	0·72	0·76
Maximum	0·90	0·97	0·89	0·96
Nutrients (n 43)				
Minimum	0·25	0·26	0·15	0·19
25th percentile	0·55	0·69	0·42	0·67
Median	0·60	0·75	0·53	0·71
75th percentile	0·66	0·86	0·60	0·80
Maximum	0·90	0·93	0·74	0·90

While it is difficult accurately to estimate median values for most of food groups and nutrients using the DCD, it has acceptable ranking ability for intakes of many food groups and nutrients. The ranking ability would be more satisfactory if the information on portion size of dishes consumed is available.

1. Fitt E, Prynne CJ, Teucher B *et al.* (2009) National Diet and Nutrition Survey: assigning mixed dishes to food groups in the nutrient databank. *J Food Compost Anal* **22**, S52–S56.
2. Stumbo PJ (2001) Structure and uses of USDA food composition databases. *J Food Compost Anal* **14**, 323–328.
3. Lin P-ID, Bromage S, Mostofa MG *et al.* (2017) Validation of a dish-based semiquantitative food questionnaire in rural Bangladesh. *Nutrients* **9**.
4. Science and Technology Agency (2010) *Standard Tables of Food Composition in Japan, 2010* (In Japanese). Science and Technology Agency. Tokyo: Official Gazette Co-operation of Japan.