



Development of a meal coding system for the identification of meal-based dietary patterns in Japan

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While dietary pattern analysis has become an important approach for the examination of habitual intakes in nutritional epidemiology, to date almost all studies have focused on the intake of individual foods, rather than the combination of foods simultaneously consumed during a specific eating occasions (meals or snacks)^(1,2). The present study aimed to develop a meal coding system for identifying meal-based dietary patterns in Japan.

Dietary data used were from the 2012 National Health and Nutrition Survey, Japan⁽³⁾, where a 1-day weighed dietary record was collected from 26,361 men and women aged ≥ 20 years. In the food diary which was divided into different time periods corresponding to breakfast, lunch, dinner and snacks, a total of 94,439 eating occasions (25,187 breakfast; 25,888 lunch; 26,248 dinner; 17,116 snacks) were identified from the original 1,192,441 food item entries. Each of the unique food items (>1600 codes) consumed by the participants were recoded into 1 of 20 food groups. After excluding 3 food groups (sugars, fats/oils and seasonings) because these were usually consumed with other foods, the analysis was based on 17 food groups (rice, bread, noodles, other grains, potatoes, pulses, vegetables, fruit, fish, meat, eggs, dairy products, confectioneries, fruit and vegetable juice, alcoholic beverages, soft drinks and non-alcoholic/non-caloric beverages). For each meal type, common food group combinations of >15 g consumption were identified to generate a number of generic meals, as ≤ 15 g consumption of any food group was considered a minor constituent of a meal. Principal component analysis was carried out by using these generic meals to identify meal patterns.

In total, 94 generic meals (24 breakfast; 27 lunch; 26 dinner; 17 snacks) were identified. The food group combination most frequently identified was “rice and vegetables” for all three main meals (9 generic meals for breakfast, 12 for lunch and 16 for dinner) while “confectioneries and non-alcoholic/non-caloric beverages” was the most prevalent for snacks (4 generic meals). A total of 19 meal patterns were identified from the principal component analysis, which explained 24.1 % of the total variance. The patterns varied considerably in terms of the meal type inclusion and the selection of staple foods (rice, bread and noodles) and beverages, as well as the constituents of the meals.

In conclusion, using a meal coding system, a wide range of meal-based dietary patterns were identified among Japanese adults. The meal coding system developed here may therefore be a useful approach to capture and investigate the complex nature of Japanese meals or food combination patterns.

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1. Leech RM, Worsley A, Timperio A *et al.* (2015) *Nutr Res Rev* **28**, 1–21.
2. Woolhead C, Gibney MJ, Walsh MC *et al.* (2015) *Am J Clin Nutr* **102**, 316–323.
3. Murakami K, Livingstone MB, Okubo H *et al.* (2017) *Br J Nutr* **117**, 161–169.