

## Original Article

# Documenting the reasons people have for choosing their food

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Understanding the reasons that people have for choosing their food, and why these choices vary, may affect the dietary advice and assumptions about the nutrient adequacy of future food intake. One group of respondents living in Jakarta, Indonesia completed two interviews with the same combined food frequency and qualitative technique, called Food Choice Map (FCM) over a one-month period. Another group of Indonesian respondents from a town in Java completed an FCM interview and a 24-hour recall interview. The Food Choice Map identified the same major foods as contributing to individual intakes as are identified by a 24-hr recall interview. The FCM also identified reasons for changes in food choice. The reasons for food choices varied less than the different food items chosen. The FCM links data on dietary behaviours with perceptions that respondents use to explain of those behaviours. Such data can be used to develop communication strategies for health promotion.

**Key Words:** Food Choice Map, Individual food intake, Reasons for food choice, Perceptions to explain dietary behaviour

## Introduction

People choose their food for a variety of reasons. These reasons may explain why food choices vary over time or between people. Understanding why food choices vary may affect the dietary advice given to people, as well as assumptions about the likely nutrient adequacy of future food intake.

The reasons related to the social environments of people are important because food is essential in maintaining not only physical health but also social functioning.<sup>1-4</sup> Individuals or groups can use access to food, and sharing of food, to enhance social status, where higher status minimises nutritional risk.<sup>5</sup> A lack of knowledge of social determinants can potentially reduce the effectiveness of nutrition interventions.<sup>6</sup>

All methods used to collect individual dietary intake can describe the reasons for food choice to some extent. However, methods differ in the extent of this description. Interview-based methods that allow the interviewer to probe for types of reasons are likely to give more comprehensive descriptions and contexts of these reasons than methods with highly structured questions.

Information on individual food intake can be used to design nutrition education, food security initiatives and other interventions, but the purpose is ultimately to associate food and the experience of health. However, the qualitative methods that can be used to document the reasons, and contexts of food choice, provide little quantified information about the foods discussed and allow little interpretation of their

possible health risks. By contrast, data obtained from the methods that quantify individual food intake allow the interpretation of health risks, but such methods provide no, or little, information on the reasons for food choice.

It appears to be difficult to obtain a record of individual intake that provides a comprehensive description of reasons for food choice and sufficient quantified information for an interpretation of health risks associated with the foods. Combining both elements in one procedure would simplify the process of associating social factors with potential health effects of food, which is currently achieved by using separate methods with the same respondents.

This paper presents the results of a qualitative interview procedure that records the frequency of food consumption and the reasons for food choices. In order to determine whether the procedure can quantify major aspects of the dietary patterns of respondents, the results are compared to the results of a 24-hour recall interview.

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## Methods

### *Quantitative technique*

Respondents completed a 24-hour recall interview. They were asked to recall the previous days food intake from rising to sleeping, identifying each food item by time of day of consumption as described by Cameron and van Staveren.<sup>7</sup>

Interviews took place in the house of the respondent and food quantities were assessed with the help of food replicas and household measures from the respondent. The ingredients of prepared dishes were recorded separately. The start of each interview dealt with demographic information about the respondent by way of introduction to the interview itself. Answers were recorded on a food intake form and the interviews were tape-recorded. Interviews took approximately 30 minutes to complete and were conducted by one interviewer, who was a graduate of a four-year German University program in human nutrition with experience in conducting 24-hour recall interviews. The interviewer conducted pilot interviews before data collection for the study.

### *Qualitative and food frequency technique*

Respondents were asked to complete a Food Choice Map interview (FCM). They were asked to consider foods they ate often in a usual week, followed by questions about the meal or snack times, foods eaten less frequently at those meals, and a variety of aspects related to those foods and their frequencies of consumption, such as where purchased, when and with whom consumed, likely importance for health, perception of cost, and other aspects of interest to the respondent. The record showed the “*most important*” food choices of respondents and their explanations for the food choice and food pattern in terms of social, economic and living environments.

During the tape-recorded conversation, the respondent helped create a visual record, or map, of food frequencies, by placing food symbols (small paper square with a generic picture of the food) on an A3 sized sheet of paper (11 by 14 inches) with grid lines, as shown in Figure 1.

Using temporary glue, each food symbol was placed vertically in the place to reflect the time of day of consumption, and horizontally in the place to reflect the number of days in a usual week, ranging from 1 to 7, that the respondent ate the food at that mealtime (Fig. 2). The food pictures used for the respondent groups in this study showed local food items. A local artist created black and white line drawings of commonly eaten foods. During the conversation, the respondent recognised the picture as a stylised symbol for a food, rather than a true reflection of the item. When the respondent ate the same food item at different meals, each symbol for the food was placed to reflect both its mealtime and the weekly frequency for that meal. The foods eaten less than once a week were not recorded, except for the few foods that were socially or emotionally important to the respondent, such as a preferred fruit out of season. These foods were recorded in the extreme left hand margin or zero column. The interviewer encouraged the respondent to take an active part in creating his/her own map by asking the respondent to move the food

symbols, especially when double-checking that their placing correctly reflected time and frequency of consumption.

As the conversation continued, the food items already recorded were used as prompts for social and economic environments of the respondents. The interviewer used a question guide to prompt all respondents to consider the same food-related aspects in these environments similar to an in-depth interview.<sup>8</sup> Although respondents considered all topics in the question guide, they generally provided extensive information about aspects they regarded as personally important, while giving less information about topics that were not relevant to their situation or interest.

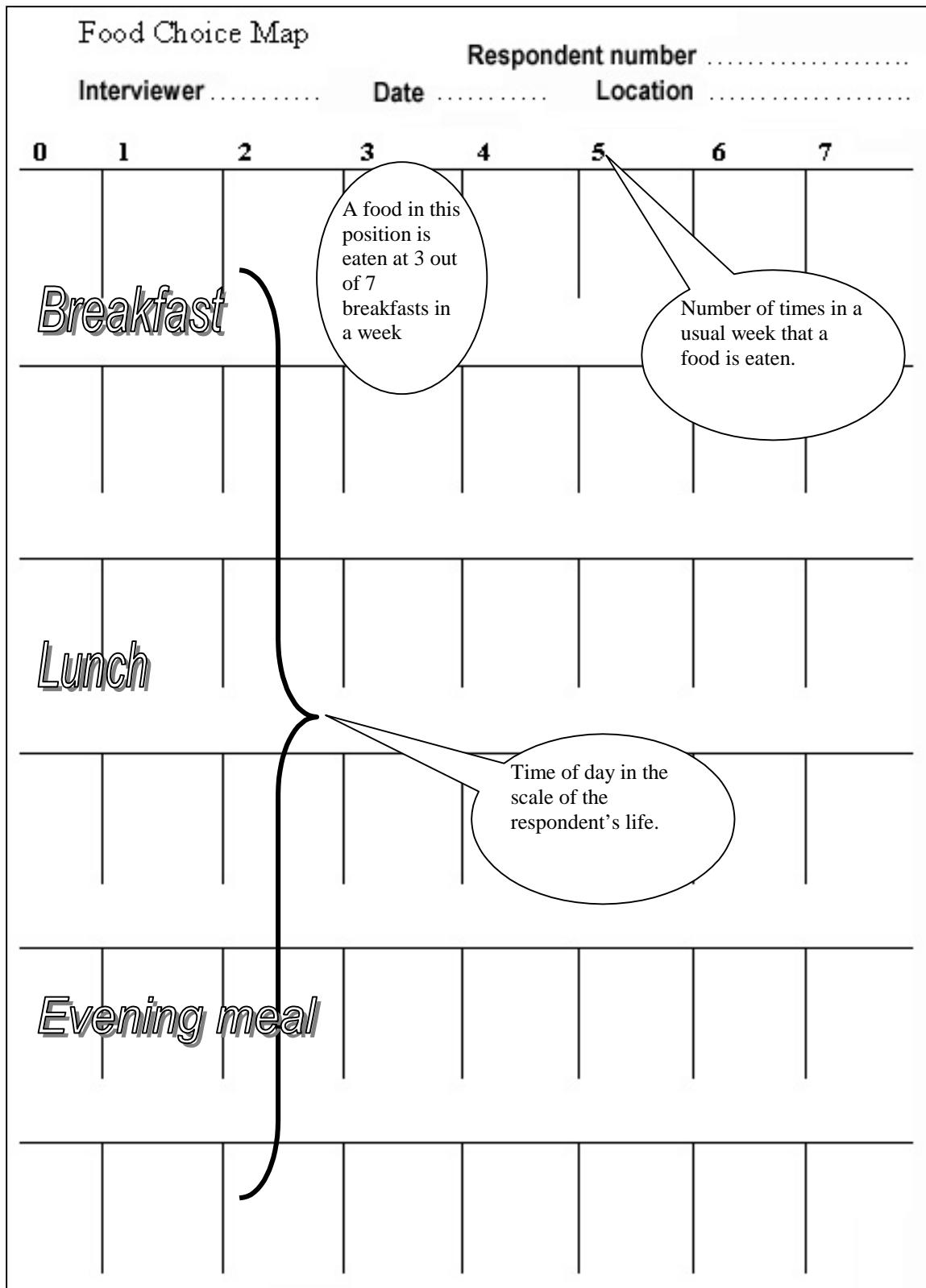
Social information was recorded on the FCM, as shown in Figure 2, by circling food items with different colour lines indicating with whom a meal was consumed and where, such as family, friends, colleagues and home, canteen, or restaurant. Additional notes were made in the margins. Economic information related to food access and availability was recorded on a separate sheet, such as the number of income earners in the household, who contributed to food expenses, who controlled food purchase and where the household obtained food (traditional market, super market or street vendor) were obtained as part of the continuing conversation about foods already recorded on the map. Cultural aspects of food consumption, and possible barriers to changing food behaviour, were also discussed, including access to cooking facilities, who prepared food and when during the day, the influence of the social circle on food consumption habits, which foods the respondent liked to eat, which foods were considered healthy, and why some food could substitute for another.

During the FCM interview, the respondent could add or change items at any time, as prompted by later recall of situations, which allowed both respondent and interviewer to verify that answers were consistent. For each of the two respondent groups, one interviewer conducted all FCM interviews using the same topic guide. Both interviewers were graduates of German University programs in human nutrition and received the same three-day training on conducting Food Choice Map interviews. The same trainer reviewed the results of pilot FCM interviews with each interviewer.

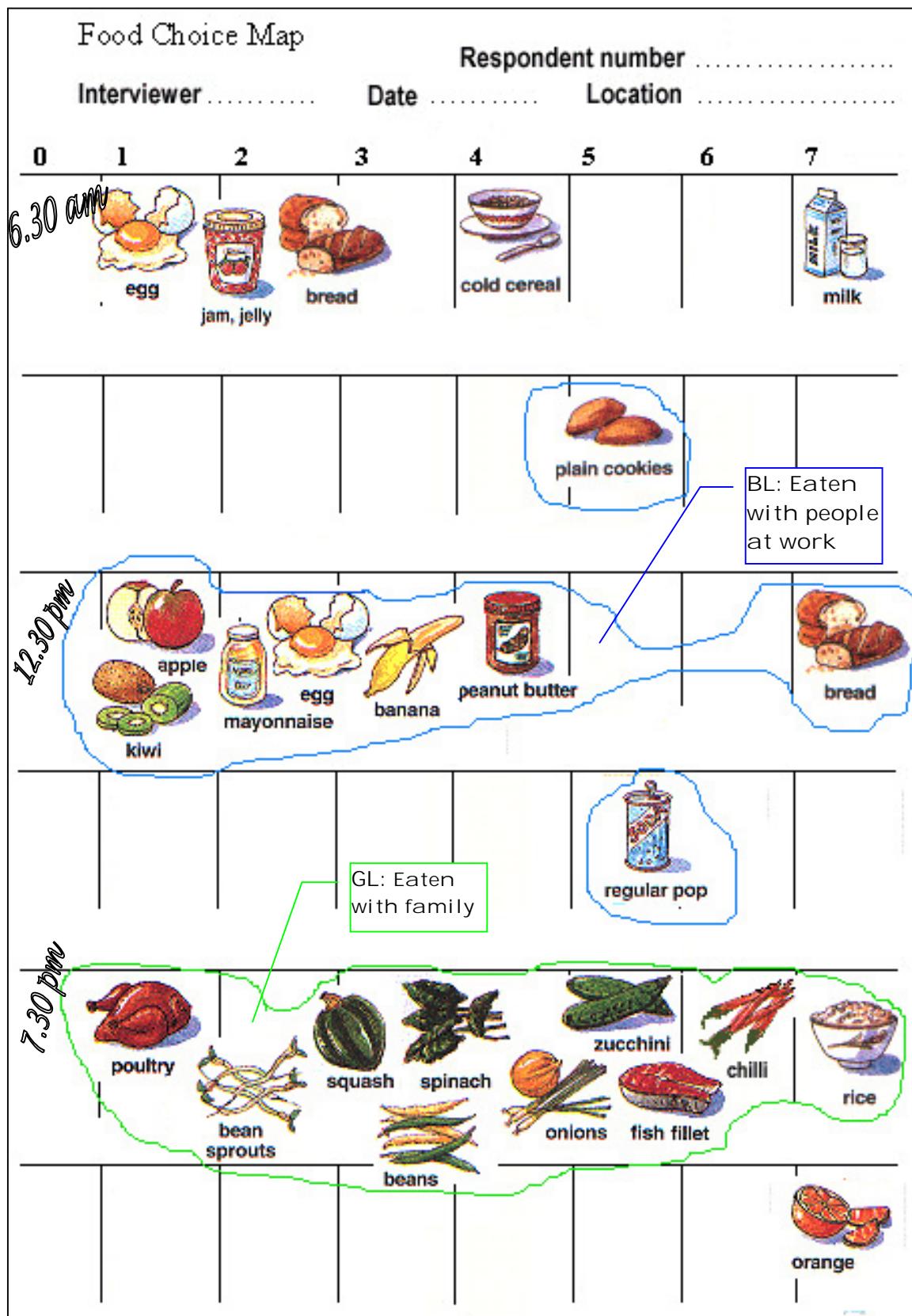
### *Respondent selection - comparison of FCM and 24 hour recall*

Twenty-two pregnant or lactating women from six villages close to the town of Bogor were asked to participate. The women were randomly selected from lists of women attending maternal and child health services maintained by the local health centre. Staff of the health centre contacted the women and explained the study.

The researchers contacted the women who agreed to participate, discussed the interviews with them and set interview times. There were no refusals. The researchers obtained permission to conduct the study from the chief village administrator and community representatives. The Ethics Review Committees of the SEAMEO Centre and University of Manitoba approved the procedures.



**Figure 1.** FCM - example of empty map to record food choices

**Figure 2.** Example of food choice map (FCM) from one respondent.

No line (NL): Eaten alone; Blue line (BL) : Eaten with friend; Green line (GL): Eaten with family.

The respondents, between 18 and 46 years, completed both a 24-hour recall interview and a FCM interview. The 24-hour recall was conducted first because women had experience of such recall procedures for infant feeding practices. The interval between the two interviews was 8 to 12 days, which was deemed long enough to avoid the memory of the 24-hour recall interview affecting the FCM interview, particularly because the FCM interview presented a different experience and context for recalling and recording food. Both interviews were conducted in the home.

#### **Respondent selection - comparison of two food choice maps over time**

Twenty-two self-selected students in a post-graduate nutrition training program in Jakarta completed two FCM interviews with an interval of one month. The respondents included 3 men and 18 women, between 25 and 40 years, with differing cultural backgrounds, such as Indonesian, Thai, Vietnamese, and Philippine. Thirteen respondents lived in rented accommodations, while the other 9 students lived with family or relatives. Most of the respondents used institutional food services, such as canteens, at some time. The ethical procedures for research with human subjects of the SEAMEO Centre and the University of Manitoba were followed in contacting students and arranging interviews.

Two indices were constructed to compare the data from the two FCM interviews. The Food Item Index (FII), scored the similarity of food items reported for each breakfast, lunch, or dinner, from 0 to 4 (0 = completely different foods consumed in the second interview; 1 = < half the same food consumed; 2 = half the same foods consumed; 3 = > half the same foods consumed; 4 = same foods consumed). The Food Frequency Index (FFI) scored the similarity of the number of times (frequency) a food item occurred in the same meal within a week, from 0 to 2 (0 = totally different; 1 = different; 2 = same). The FCM interviews did not quantify the food amounts eaten and no nutrient intake was calculated.

## **Results**

### **Comparison of FCM and 24 hour recall**

The major elements of dietary patterns were compared, which included: a) the frequencies of three most frequently occurring foods, because such foods tend to have a larger influence on the nutrient content of the diet than other foods; b) the time of meal or snack consumption, because the timing shows the dietary response to physical and social factors. These two elements were assumed to be sufficiently stable in the behaviour of respondents to use a single 24-hour recall record for each respondent.

Since the FCM and 24-hour recall are different measures no comparisons of food or nutrient amounts were made. The FCM shows the daily variation in food choice in the number of foods recorded, while the 24-hr recall does not. Figure 3 shows that the 24-hour recall included on average fewer than half the foods reported in the FCM, suggesting the respondents had access to a varied food supply from which to make their choices.

### **Highest frequency food**

In each FCM, the most frequently eaten food item was ranked as number 1, with the next highest foods ranked as 2 and 3 in descending order. Among 22 respondents, foods with rank 1 included rice, tempeh and tofu. Examples of foods with ranks 2 or 3 in FCM's are listed in Table 1.

Table 1 shows the number of times that these same foods had the same rank or adjoining ranks in the 24-hr recall record. For the most frequently occurring foods in the FCM, the majority of 24-hr recall records show the same or an adjoining frequency rank (Chi-square  $P<0.005$ ). Since the most frequently eaten foods determine the type, and potential nutritional adequacy, of the diet, the FCM and 24-hour recall records identify the same nutritionally important food pattern.

**Table 1.** Comparison of foods with the highest frequencies of consumption reported in Food Choice Map records and 24-hr recall records.

Highest frequency foods reported in Food Choice Map	Number of instances that the same foods were reported at the same or adjoining ranks in the 24-hr recall			
	Rank 1, 2 or 3	Rank 2, 3 or 4	Rank 3, 4 or 5	Not reported
Rank 1 <sup>1</sup> : e.g. rice, tempe or tofu (n=27 <sup>2</sup> )	23	1	1	2
Rank 2: e.g. fish, vegetable, tofu, banana (n=39)	2	10	4	23
Rank 3: e.g. vegetables, tofu, egg, tempe, chicken (n=42)	0	4	11	26

<sup>1</sup>rank1 = highest frequency; <sup>2</sup>some respondents reported tied ranks

### **Time structure of consumption**

The number of foods reported at meal or snack times, expressed as proportion of the total number of foods in the record, were similar in both the FCM and 24-hour recall records. The sequence of times during the day that respondents ate higher than average numbers of foods versus average or less than average numbers (frequencies above and below the regression line in Fig. 3) were similar and not statistically different between the two records (Sign Test,  $P>0.05$ ). The timing of consumption is the outcome of physical environment, social situations and personal preferences. Since both records show similar patterns, it appears that both capture the same effect of these influences for each respondent. Respondents differed in the timing of breakfast due to the demands of farming, casual labour or formal employment.

### Comparison of two food choice maps over time

#### Changes in food choices and frequencies over one month

All respondents changed at least some of their food choices over one month, and the frequency of consumption for at least some foods. These two changes were related, as shown by the statistically significant relationship between changes in food choices and frequency of consumption (Fig. 4, Anova  $P < 0.001$ ). The common explanation for these changes were that access to foods had changed, firstly because students shifted from class room work to field work in different locations, and secondly because some foods were no longer available, such as seasonal fruits.

In addition, some of the respondents experienced changes in living situations in the period between the two interviews, such as changes in having to share money with others, or money for food, or access to food preparation facilities, or usual locations of food consumption. These changes did not significantly affect differences in food choice or food frequency between those who changed their living situation and those who did not (Fig. 4, unpaired T-test,  $P < 0.390$ ). However, more respondents whose situation did not change reported eating more of the same foods in both interviews than the respondents whose living conditions did change (proportion reporting 60 % or more of foods as the same,  $P < 0.025$ ). The relationship between choices and frequencies suggest that the two interviews captured consistent changes. Some of these changes may have been associated with changes in living conditions.

### Respondent's reasons for food choices

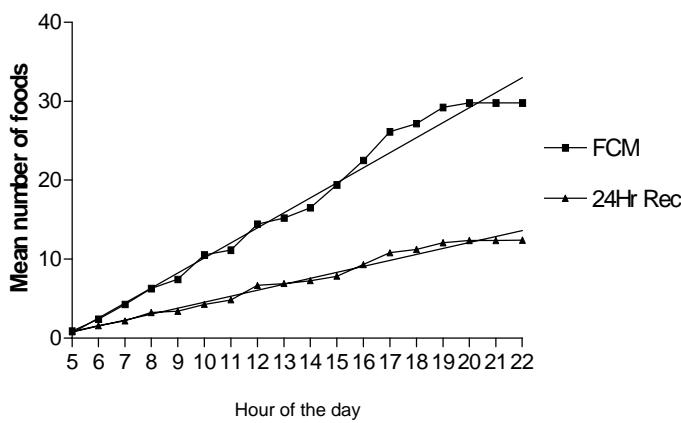
Out of a total of 156 reasons mentioned by the 22 respondents for choices of food items: 88% were the same in both interviews, 3% were entirely different, and 8% coincided, but were differently phrased. All respondents maintained their social circle (family members, friends, or colleagues eating together) over the one month interval, regardless of changes in living conditions or accommodation.

Seventy-seven percent of all respondents indicated at least one food preference. Food choices for health reasons were mentioned by 82%, whereas food choices for economic reasons were only given by 36% of the students. Table 2 shows reasons respondents gave for their food patterns, which show strong influences from living conditions, food preferences, perceived importance for health and economic status.

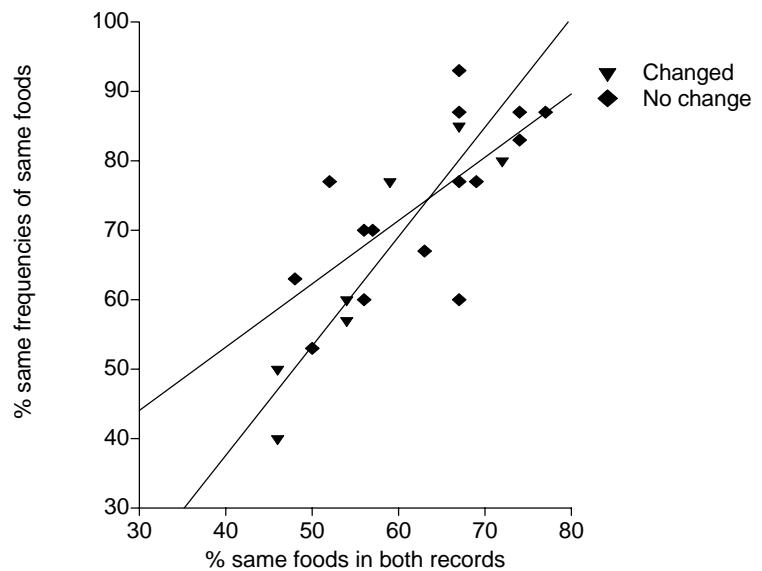
Since only 3% of reasons for food choices recorded in two interviews were entirely different, the FCM technique captures most of the social and economic determinants consistently. Although the interview records show an effect of these determinants on food choice, the validity of these determinants could not be assessed from these data.

### Discussion

The 24-hr recall and the food frequency data of the FCM identified the same foods as major contributors to individual intakes. Also, these two methods identified the same pattern of daily meal and snack consumption. The FCM, as implemented in this study, provides a level of quantification of food intake that allows professionals to make similar conclusions about dietary structure as they would from a 24-hour recall.



**Figure 3.** Mean cumulative number of foods reported in the two records by 22 respondents



**Figure 4.** Scatter plot of index of variation and index of frequency by change in living situation of respondents

**Table 2.** Examples of reasons respondents gave for their food choices listed by types of reasons

Type of reason	Examples
1. Living situations:	
a. Alone	<i>"Before I was very homesick, so I went often to Kentucky fried chicken"</i>
b. Time pressure	<i>"Recently I have started eating macaroni because it saves time"</i>
c. Cooking facilities	<i>"I can not store food, so what is left over from the night before I eat at breakfast"</i>
2. Food preferences:	
a. For chicken	<i>"Now I have more freedom to cook what like, because I moved and have cooking facilities"</i>
b. For fish	<i>"I eat mostly chicken, because the [other] meals I can choose have too much hot pepper"</i> <i>"It takes the canteen too long to prepare fish, so I do not choose to eat it there"</i>
3. Health perceptions:	
a. Of chicken & fish	<i>"I eat chicken or fish many times because high quality protein is better"</i>
b. Of vegetables	<i>"I try to eat vegetables, I am used to eating them and are important for good health"</i>
4. Food costs:	
a. Sharing expenses	<i>"My diet is not the best, but I depend on others and have to save money"</i> <i>"Everybody shares in the food expenses, managed by mother"</i>
b. Cheaper food	<i>"It is difficult to eat good, so when I can I choose chicken because it is less expensive"</i> <i>"I always buy fruit that is in season because it is the cheapest and as good as imported"</i>

This aspect of the performance of the FCM is similar to that of commonly used food frequency questionnaires. Development of the FCM can include the estimated amount of each food portion reported in the map, which would be written on the map next to the food picture. Depending on the time taken, and the precision achieved, in recording these amounts, the FCM could equal a semi-quantified food frequency or a seven-day recall interview. Similarly, it is possible to specify oils or fats or salt added to the foods during preparation. Such details would be recorded in the margin of the map.

The data shows that the reasons for changes in dietary patterns obtained with the FCM were more stable than the food choices themselves over a one-month period, which suggests that the reasons for food choice vary less than the choice of food items. The extent of change in a dietary pattern appeared to relate to changes in the living conditions of a respondent. This aspect of the performance of the FCM is similar to a qualitative in-depth interview. Other applications can include concepts related to stage of learning or perceptions of health related to the use of food.

Unlike commonly used methods for assessing individual intakes, the FCM links quantifiable data on dietary behaviours with perceptions that respondents use to explain of those behaviours. The advantage of the FCM is that this link is explained by the respondent, rather than relying on a researcher's explanation of associations between data from a dietary assessment method and an in-depth interview.

Although the FCM takes longer to complete than a 24-hour recall, it is shorter than most in-depth interviews, which are usually longer than an hour. In this study, the FCM was tape-recorded. In practice, it is not necessary to tape the conversation about food frequencies and other data recorded

on the visual map. However, if the in-depth interview is expanded, the conversation would have to be recorded in the same way as a regular in-depth interview would be.

As the FCM interview progressed, respondents corrected details they had already recorded, and it is very likely that they increased the apparent validity of the method.<sup>9</sup> Correction by the respondent, of a food item or its frequency of consumption, was triggered by details of other food-related experiences discussed later in the interview. In this context, Tapsell<sup>10</sup> reported the use of conversation analysis to increase the accuracy of the diet history interview. This element is missing from traditional food frequency questionnaires, for which generally low validity had been reported in estimating foods eaten by individuals.<sup>11,12</sup> Kumar *et al*<sup>13</sup> also described that accuracy of recall can be improved by questioning the respondent about the context in which an event occurred, with the use of recall techniques such as copies of magazines, pictures, or lists. Corrections were dealt with quickly because both the respondent and the interviewer could compare details being reported with information already on the visual map. Therefore, it seems that the FCM record is a more complete reflection of the respondent's experience than records in which answers are not reconsidered.

The visual map created during the FCM interview, using pictures or names of foods that are locally familiar, also helps in the cultural adaptation of dietary assessment. The 24-hour recall is used in many countries and it is adapted to local food choices and habits. The FCM is adapted in the same way. Adaptation of a food frequency questionnaire would be more cumbersome because its structure needs to be adapted, as well as the selection of foods.

The personal experience and views that respondents reported always included information about their social net-

work, their main sources of information, as well as coping mechanisms to overcome barriers. In the FCM, these social aspects related to specific food choices. This social context of foods allows professionals to provide dietary advice that goes beyond instructions to substitute one type of food, or food preparation style, with another.

The FCM may be an additional tool to link dietary intakes with chronic disease incidence by helping to characterize food patterns and experience, instead of only nutrient intakes.<sup>14</sup> Tseng and DeVellis<sup>15</sup> suggest that the dietary pattern may better capture multiple nutrient effects than single dietary components and mentions it's potential usefulness in dietary interventions. Millen *et.al.*<sup>16</sup> points to the importance of linking dietary patterns to other health behaviours in order to understand chronic diseases.

Using the links that respondents report between their food or health related behaviours, their perceptions, their social environments and their responses to those environments, allows professionals to provide dietary advice that goes beyond instructions to substitute one type of food, or food preparation style, with another. In addition, the FCM can be structured to provide more quantified data on food and nutrient intake, which can be used to link chronic disease with the social determinants of dietary patterns. The FCM can be structured to provide more detail of motivational, social, and cultural factors, which can be used to develop communication strategies and planning of health promotion initiatives.

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