



## Diet history: Method and applications

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### Abstract

The diet history is a traditional method of analysis of food intake. In its traditional structure consists of three components that provide an overall information of the usual food consumption pattern of the individual and also detailed information on certain foods. The information is collected in an interview and requires highly experienced qualified interviewers. The quality of information depends largely on the skills of the interviewer. It is mostly used in clinical practice. It has also been used in studies of diet and health relationship to investigate the usual diet in the past. The high cost and long duration of the interview limit their usefulness in large epidemiological studies

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Several methods have been described with the aim to assess food intake of an individual or a group, where information is collected during a face-to-face interview, by self-reports in traditional paper and pencil forms or supported by the new technologies in electronic forms, web-based or other electronic devices, collected by direct observations, etc. The first food consumption studies conducted using rigorous methodology were published in the decade of the 1930s<sup>1</sup>.

The Diet History methodology is a detailed retrospective method of diet assessment used more frequently in the clinical practice than in research studies. Diet History is used to describe food and/or usual nutrient intake during a relatively long period, for example, 1 month, 6 months or 1 year.

The Diet History method was developed by Burke during the years 1938 to 1947 in a clinical environment<sup>2</sup>. Hence the name “Diet History” in analogy to the classic “Clinical History”.

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### HISTORIA DIETÉTICA: METODOLOGÍA Y APLICACIONES

#### Resumen

La historia dietética es método tradicional de análisis de la ingesta alimentaria. En su estructura tradicional consta de tres componentes que proporcionan una información global del patrón de ingesta habitual del individuo y también información detallada sobre algunos alimentos. La información se recoge en una entrevista y requiere encuestadores cualificados con gran experiencia. La calidad de la información depende en gran medida de la habilidad del encuestador. Se utiliza sobre todo en la práctica clínica. También se ha utilizado en estudios sobre la relación dieta y salud para investigar la dieta habitual en el pasado. El alto coste y la larga duración de la entrevista limitan su utilidad en grandes estudios epidemiológicos.

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Palabras clave: *Alimentos. Hábitos alimentarios. Registro dietético. Dietética. Historia.*

The original technique was structured in 3 parts:

- Interview about the usual food intake pattern of the surveyed individual, estimating the amount consumed by means of household measures.
- A questionnaire consisting of a detailed food list to assess the overall pattern of food intake and to cross-check the information collected in the first part.
- A 3-day food record with estimated portion sizes of the foods and beverages consumed<sup>3</sup>.

As described by Burke, the central element of the Diet History is the detailed interview on the usual intake of the subject. The food diary for 3 days and the food frequency questionnaire are used as a cross-checking technique for verifying information.

This method has been used in multiple well known studies, since its use in the initial phases of the Framingham study in USA<sup>4</sup>, up to the fieldwork conducted in Spain within the European Pilot Study on Diet and Cancer (EPIC)<sup>5</sup>. Nevertheless, the method has several

limitations that should be considered and have prevented a generalized use in epidemiological studies. Some authors, checking such pilot studies as the previously mentioned Framingham, suggest that generally, the diet history method tends to overestimate intake<sup>6</sup>.

### **The Diet History method**

Basically the diet history is an interview with the studied person carried out by an interviewer who needs to be highly qualified in nutrition and dietetics and properly trained to conduct the interview. Participants are asked to try to remember their own food intake for a certain period of time<sup>7</sup>.

In its original format the interview asked about the usual meal pattern, food preparation methods as well as frequency of food consumption. This original model has been modified over the years and nowadays there is not a homogeneous standard for the utilization of this tool.

The diet history method assesses quantitatively the global food intake of an individual, habits in relation to food consumption, distribution and usual composition of meals throughout the day, etc ...<sup>8</sup>.

The complete method usually consists of the following parts<sup>9</sup>:

- An interview to estimate the habitual consumption of a wide variety of foods in the different eating occasions in a day that often begins by a 24 hours recall, bearing in mind possible seasonal or week variations.
- A food frequency questionnaire to verify information.
- A 3 day dietary record.

Most of the research studies that have used this method to collect diet information have limited the tool to the first part. The photographs or food models are very helpful to estimate the size of the portions eaten.

Nevertheless, currently there is no standard protocol to apply this method which is accepted unanimously, and very different approaches to this method are reported in published research<sup>10</sup>.

Adequate training of the interviewers is a very important aspect to guarantee the quality of the information and to reduce differences between interviewers in the quality of the data collected<sup>11,12</sup>. It is recommended that experienced nutritionists familiar with the method are responsible for conducting the interviews, so that they do not interfere in the information and are able to direct and guide the interview up to its conclusion<sup>13</sup>.

The complexity of the interview requires experience with the method and training in dietetics and nutrition to be able to carry it out properly. The interviewer can give prompts to help recall, but must not make suggestions that interfere or induce answers. At an early stage, before the start of fieldwork, all the interviewers

involved in data collection should follow a strict training protocol to control and reduce systematic error. The quality of the obtained information and therefore the validity of the method depends basically on the ability and skills of the trained interviewers. The person responsible for conducting the interviews need to be familiar with the protocol, the questionnaire to use and require good communications skills, so they are able to create a nice atmosphere for the interview. They must keep the pace of the interview and ask control questions to make sure of the answers that on the other hand, must be as concrete and specific as possible.

The person carrying out the interview will try to gather information not only on the regular consumption of food and drinks, but also on all the related information that is considered to be important in connection with the food habits of the person interviewed (food allergies, dietetic preferences, seasonal variations, etc.).

Information is compiled in an interview that can take from 1 to 2 hours. For that reason it is important to provide standard forms to collect the information, including day-to-day variations and irregular patterns or exceptional food consumptions.

However, such a long procedure can turn out to be tedious for the person being interviewed. Some authors have contributed with innovations to the method that try to reduce the duration of the interview and to systematize the format to gather information, in a way that the presence of the interviewer is not specifically required<sup>14</sup>.

The Diet History method requires an effort to recognize the usual pattern of food consumption of the individual, which requires a high capacity for abstraction. So it is not a method applicable to children under 14 yr . or the elderly aged over 80 yr., since the method rather than being based on their ability to recall punctual aspects, it tries to help them recognize their general habits of food intake.

### **Methodology**

As previously outlined, the Diet History can be divided into three parts:

- The record of food consumed during 2 or 3 days or a recall of the food consumed over the previous 24 hours to learn the food intake pattern.
- Frequency of food consumption.
- Specific questions relevant for the survey carried out.

The 24 hours recall is a retrospective method in which the interviewed person is requested to remember all the food and drinks consumed in the previous 24 hours period, or during the previous day. The interviewer uses photographs or household measures in order to help the interviewed to quantify the amounts

used of all food items and/or ingredients of the plates and drinks consumed.

Usually a chronological order is followed throughout the day. Therefore it is advisable to structure the interview into different time slots during the day, such as breakfast, mid-morning snack, lunch, afternoon snack, dinner and other occasions <sup>15</sup>.

If the procedure of choice is the food diary or dietary record, unlike the previous one, it consists of asking the interviewed person to note down every day (during a variable period of 3 to 7 days), all food and drinks consumed during each of the surveyed days. This method requires to provide detailed instructions to the interviewed person previously. The double weighing method (weighing before and after the meal) is a variation of the food diary or dietary record.

The food frequency questionnaire consists of a list of foods, or groups of food, for which frequency of consumption is requested (daily, weekly or monthly), on each one of the items.

The information obtained is basically qualitative, though if the proportion or average portion consumed is added next to each foodstuff, a semi-quantitative assessment can be obtained. This questionnaire can be self-administered<sup>16</sup>.

The food frequency questionnaire it is not intended to assess the food consumed in a certain day, but to assess broadly the usual pattern. For this purpose the

procedure asks about the food usually consumed, the way it is prepared, how frequently it is consumed as part of the diet (daily, weekly or monthly) and in what quantity. It must be clearly stated that the questionnaire refers to the habits of food consumption of the interviewed person specifically. Sometimes the respondents are the persons in charge of the family meals and it is possible that they refer to the family habits in their answers and not to their own. Figure 1 shows an example of a questionnaire about breakfast habits.

It is useful to estimate the quantities in household measures, units, portions or servings as well as to describe the recipes.

Photographs of foods and dishes, different types of food models or replicas showing different serving and portion sizes are useful aids to estimate the amount of food consumed or the size of the reported portion. Sometimes a suggested list of food is used for each of the main meals and eating occasions throughout the day, different ways of preparation etc. to facilitate the recall process of the interviewed person. This list also serves as a checking mechanism and quality control of the data collected.

The interviewed person is asked whether or not usually consumes each one of the foods included in the list and a usual consumption is considered for foods consumed at least once a month<sup>17</sup>, prepared in any way. If the answer is “YES” for an item in the food

Desayuno ¿Cuántas veces desayuna a la semana? ( )							¿Es igual los fines de semana? SI ( ) NO ( )				
ALIMENTOS	TIPO	CONSUME		FRECUENCIA			CANTIDAD Tamaño de medida, porción o ración	Nº UNIDADES	Nº MODELO Si existen modelos de referencia	MARCAS OBSERVACIONES	Gramos /día
		SI	NO	D	S	M					
Leche											
Yogur											
Zumos											
Infusiones											
¿Añade algo a lo anterior?											
Café											
Cacao											
Azúcar											
Miel											
Edulcorante											
Otros											
Pan											
Bollería											
Galletas											
Cereales											
Frutas											
Otros											
¿Unta algo en el pan o en la bollería? Siempre ( ) A veces ( ) Nunca ( )											
Aceite											
Mantequilla											
Margarina											
Mermelada											
Otros											
¿Añade algo a lo anterior?											
Jamón cocido											
Jamón serrano											
Fiambre de pavo											
Queso											
Huevos											
Otros											

Fig. 1.—Model simple of a diet history questionnaire about food usually consumed for breakfast .

**Table II**  
*Uses, advantages and limitations of the Diet History method*

<i>Uses</i>	<i>Advantages</i>	<i>Limitations</i>
Main use in clinical practice	Can be used with low literacy people	Quality of the data collected depends to a great extent on the skills of the interviewer
Provides information about the usual food consumption pattern	Details about the different foods consumed in each meal or eating occasion	An expert interviewer is required and demands a high collaboration from the interview
Estimate prevalence of diet inadequacy	Includes foods consumed less frequently or irregularly	The method is difficult for people with highly variable food habits, such as people working in shifts
Useful in epidemiological studies about the relationship between diet and health, both retrospective and prospective studies	Asks about the usual food intake of an individual	It can be difficult to assess portion sizes even when food photographs or food models are used as aids
Usual mean intake of nutrients over a period of time	Collects information about the whole diet	Due to the need for specific training of interviewers, coding, etc. it can be a costly method
	Allows to get a more representative pattern than other methods of diet assessment in the past	Comparability of the data is not epidemiologically guaranteed as no standard protocol to complete a diet history
	Can be design to assess the whole dieto or just certain nutrients	Imprecise from a quantitative view
	There are some versions with limited added cost	Use not recommended with children under 14 yr or adults aged 80+ yr
	Does not influence food behaviour of the interviewee	Difficult to precise the period to recall

Modified from: Aranceta Bartrina J, Serra Majem LI. Historia dietética. En: Serra Majem LI, Aranceta Bartrina J (eds). Nutrición y salud pública. Métodos, bases científicas y aplicaciones (2ª edición). Barcelona: Elsevier, 2006: 184-191<sup>8</sup>

list, we try to assess how often it is usually consumed, avoiding ambiguous or doubtful answers. It must be the interviewed person who defines the frequency of consumption and in no way the interviewer should assume or decide it.

Some authors have suggested the possibility of using pre-coded questionnaires and a close-ended list of foods as an alternative to the open interview. When these standardized protocols are the procedure of choice it is not required highly skilled interviewers to collect the information.

Table II presents a summary of advantages and limitations of the Diet History method.

### **Applications**

This method is adequate when detailed information on usual food intake or food intake during a specific period of life at individual level is required<sup>18</sup>.

Nowadays the main application of the diet history method is in clinical practice. Given the historical relevance of the method, many attempts have been made to shorten and simplify the procedures in this method and therefore it could be useful and applicable in epidemiological studies<sup>19,20</sup>. Many case control studies have used a modified version of the diet history methodology<sup>21</sup>.

The diet history is a costly method and often it is not applicable in large scale population studies. The quality of the information depends mostly on the skills and experience of the person conducting the interview. Generally, the method collects qualitative data on habits of food consumption, rather than quantitative absolute values of intake, except for the case some adjustments are introduced in the protocol so that it is possible to collect quantitative reliable information<sup>22</sup>.

The method focuses on the evaluation of the usual regular pattern, so exceptional or situations are underestimated. Diet history is problematic for application

in groups with very irregular habits of food consumption. It can be of limited use when collecting data on people that snacking during the whole day and do not have proper meals in an organized way.

The ability to recall food intake often refers to the recent past and may not be exactly the same as the reference period of interest for the study. By means of the diet history it is possible to assess the habits of use of particular foods of interest; nevertheless, it is not possible to estimate day-to-day variation in consumption.

Obtaining information about diet in the distant past by means of retrospective diet history is a useful method in studies on the relationship between diet and cancer or diet and chronic diseases in spite of the systematic bias involved and can provide useful information about the current food consumption habits<sup>23</sup>.

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