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Sources of information on food consumption in Spain and Europe

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Abstract

Estimation of food consumption and nutrient intake is a topic of growing interest. Currently, both in Europe and in Spain, there are numerous sources of information on food consumption, that we provide information on different levels: national, household and individual, all of them are useful, but including some limitations, mainly arising from the lack of accurate data on food purchased but not consumed.

The data obtained allow, among other things, meet dietary habits, explore the food quality, study the energy and nutrient intake and / or assessing exposure to food risks.

Among the existing sources in Spain can highlight two surveys especially useful: the Household Budget Survey of the National Statistics Institute (INE) and Food Consumption Panel Ministry of Agriculture, Food and Environment (MAGRAMA). Both provide for many years food consumption but, lately, only in households.

Both European and Spanish would be necessary to improve the usefulness of the data, standardize the type of survey used and could be comparable between them.

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FUENTES DE INFORMACIÓN SOBRE EL CONSUMO ALIMENTARIO EN ESPAÑA Y EUROPA

Resumen

La estimación del consumo de alimentos y la ingesta de nutrientes es un tema de creciente interés. Actualmente, tanto en Europa como en España, existen fuentes de información sobre el consumo de alimentos, que nos ofrecen esta información a distintos niveles: nacional, familiar o individual, todas ellas son de gran utilidad, pero incluyen algunas limitaciones, principalmente derivadas de la falta de datos precisos sobre los alimentos comprados pero no consumidos.

Los datos obtenidos permiten, entre otras, conocer los hábitos alimentarios, explorar la calidad de la alimentación, estudiar la ingesta de energía y nutrientes y/o evaluar la exposición a riesgos alimentarios.

Entre las fuentes existentes en España se pueden resaltar dos encuestas de especial utilidad: la encuesta de presupuestos familiares del Instituto Nacional de Estadística (INE) y el panel de consumo de alimentos del Ministerio de Agricultura, Alimentación y Medio Ambiente (MAGRAMA). Ambas proporcionan desde hace bastantes años la información relativa al consumo de alimentos pero, últimamente, sólo en hogares.

Tanto a nivel europeo como español sería necesario, para mejorar la utilidad de los datos, estandarizar el tipo de encuestas utilizadas, para ser comparables entre ellas.

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Palabras clave: *Consumo de alimentos. España. Europa.*

Abbreviations

HBS: Household budget surveys.
AECOSAN: Spanish Agency for Consumer Affairs, Food Safety and Nutrition.
EFSA: European Food Safety Authority.
FAO: Food and Agriculture Organization of the United Nations.
EFG: European Food Groups.
FEN: Spanish Nutrition Foundation.
UE: European Union.
HBS: Household Budget Survey.
INE: National Statistics Office.
COICOP: Classification of Individual Consumption by Purpose.
MAGRAMA: Ministry of Agriculture, Food and Environment.

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Background

There are many factors that influence in the health of the population, some of them such as age, sex, race,

etc. cannot influence, but there are others, among which is the consumption of food if modified. Therefore, there is growing interest in learning about food consumption of the population.

Food intake is regulated in humans by many factors, other than nutritional ones, that together determine their choice and therefore food habits. Food habits are the result of more or less conscious, collective in most cases and always repetitive behavior, which leads to selecting, preparing and eating a particular food or menu as a part of their social, cultural and religious customs and which is influenced by multiple factors (socioeconomic, cultural, geographic, etc.).

Along time various tools have been used, more or less correctly, to achieve this goal. Information can be obtained at three different levels, which depend on the consumer unit: national, family or individual and the methodology in the collection of food consumption data (Fig. 1).

National surveys: The estimated supply of food for human consumption is performed by the technique of *food balance sheets* with national statistics on production, imports, exports, food etc. Food balance sheets present a comprehensive picture of the pattern of a country's food supply during a specified reference period.

The estimates are based on an inventory of available food for the inhabitants of a country. Considering the production and imports of food and making deductions export losses in storage or transportation and employment purposes other than human consumption (animal feed, seeds for farming, industrial uses, etc.) is obtained by dividing by the census of the country, an indirect estimate of the average availability per person per day.

Food and Agriculture Organization of the United Nations (FAO) published the first food balance sheets in 1949 that included the periods 1934-38 and 1947-48, and has since made numerous publications periodicals on the subject[1].

To know food consumption can also make *dietary surveys* that provide a quantitative and qualitative assessment of a food or food group in an individual during a given period of time.

Household surveys: Household budget surveys (HBS) control of all food consumed by the family is usually done for a week or, in the case of a collective dining room, for the time necessary to cover an entire period of menus. In the collective dining room all meals or only some of them can be made. In them the consumer unit is the household (institution or homogeneous group). HBS are periodically conducted by the National Statistical Offices of most European countries.

The technique consists of measuring all foods which are in the larder at the beginning and end of the study, adding daily entries: shopping, gifts, etc. and all those outlets which are not intended for consumption of respondents.

Subsequently, a homogeneous distribution among all the diners is performed. Often the respondent group presents quite homogeneous characteristics, for example, when it comes to school meals or nursing homes. In others, however, as in a family the composition can be very heterogeneous.

In 1945, at the First Session of the FAO (Quebec), indicated that they should start making dietary surveys, globally, to collect data on food consumption, food habits, nutritional status, the prevalence of malnutrition and deficiency diseases. The importance of consumer studies based on HBS as additional information to food balance sheets was also mentioned[2].

Individual survey: There are many methods to study individual food intake. Some of them studying current intake, *prospective* as weighing method, and other studying past intake, *retrospective* as food frequency questionnaire, 24-hour recall, diet history, that we provide information on the individual consumption.

The weighing method can be used in surveys in which very accurate data on food intake of individuals or groups are desired. Because of its expense that method is restricted to small samples. The estimated food record is a little less accurate but is especially suitable for individual surveys and a larger sample is possible than with the weighing method.

The 24-hour recall was conceived by Burke the late 1930s and developed by Wiehl in the early 1940s[3], who used it the first time in 1942. It is one of the most used

	Method	Find out differences between
National surveys	Food Balance Sheets	Countries and regions worldwide
Family surveys	Household budget surveys	Country, locality, seasonal, household
	Household surveys: shopping basket	
Individual surveys	The weighing method	Geographics, seasonal and demographics subgroup and individuals
	Food frequency questionnaire	
	24-hour recall	
	Diet history	Temporary and demographics subgroup and individuals

Fig. 1.—Sources of information. Dietary surveys.

techniques for its simplicity. Purpose: obtain detailed information about all foods and beverages consumed on a given day. The participant recalled the food and beverage intake for the past 24 hours (and possibly dietary supplements). Food quantities were assessed by using of household measures, food models, pictures, or the brands.

The classic version of a diet history was developed by Burke in 1947 and quantitatively assesses an individual intake and eating habits[3]. Allows to know the usual diet of a person generally used as reference period remember the last month.

The method consists of three components:

1. Frequency of food consumption refers to the last month (a list of foods and beverages for which usual frequency and amount are queried).
2. Detailed questions about usual patterns of eating, organized by meal.
3. A self-administered 3-day food record or alternatively a 24-hours recall. The food list and the 3-day food record are used only as cross-checks to modify information gathered during the meal pattern interview.

Both recall and diet history give fairly reliable mean results of the nutrient intakes of groups of individuals, but they are less suitable for surveying the food consumption of individuals. An advantage of diet history over recall is that it provides data on the normal food consumption, which is of importance in epidemiological investigations in particular.

Although the results are not quite as accurate as those obtained by the weighed or estimated food records, they give a good general idea of the diet. An advantage of the method is that the sample is large, although it cannot always be representative. With and without stock inventories it can be used also for studying the intake of people living in institutions. The interview methods are the cheapest ones for collecting food consumption data of large population groups selected at random.

The choice of data at national, household or individual levels will depend on the objectives of the work for which these data are used.

Therefore, we propose to make a description of the current status of the different sources of information on food consumption in Spain and Europe describing its limitations, controversies and applications.

Interest

Knowledge of food consumption in Europe and Spain will be useful in different ways. Their usefulness will be influenced by the level at which this data is collected.

At state level these studies can be useful in formulating nutrition policy, planning adequacy of supply, production, food distribution and regulation of food products.

They will also have an important nutritional interest because they are allowed to know the intake of energy and nutrients and compare this with the reference values or recommendations. This data will help identify individuals or populations, inadequate intakes for deficiencies or excesses, and identify risk groups among the study population. They allow to know food habits, consumption of fortified foods and explore the quality of food. In this sense also be possible to evaluate intervention and nutrition education programs. Therefore, we can perform a map of nutritional status. It will be possible to evaluate the risks and exposure to dietary intake of toxic substances pollutants or food additives.

On the other hand, are very important in public health. This will allow to investigate the relationship between diet, health and nutrition states and thereby improve the health status of the population and prevent disease. To know global and regional food consumption patterns and trends is useful to promote healthy diets and lifestyles to reduce the global burden of noncommunicable diseases because there are a positive correlations between foods and different diseases.

These studies also allow us to estimate the daily consumption of a particular food or beverages.

Controversy

There is a great discussion regarding the usefulness of dietary surveys because of biases produced by different methods used, since no method gives an exact image of what it consumes a population or an individual, because all have limitations.

Therefore, it is important that each study using the most appropriate method will depend on the purpose of the work, sample the type of information, accuracy, etc., and thus get a proper map of food consumption at all times.

For this reason, it is preferable to use an instrument that collects dietary data with the least bias possible.

Limitations

When speaking of limitations, we must distinguish between the different methods used to obtain food consumption, because each has distinct features as well as strengths and limitations.

National surveys: when studying consumption nationally use food balance we only indicate the quantities of food available for human consumption at the national level do not indicate what is actually consumed. It is not considered possible losses along the food chain, storage, transportation, preparation, etc., not food intended for animal use are taken into account.

On the other hand, do not provide data on the difference in the diet consumed between different regions or in different months.

When speaking of family or individual level to obtain detailed information about access to food in the home or individual food consumption can be long and expensive, and require a high level of technical capability for both the collection and the analysis of data.

HBS: Provide us with information on the consumption of food at home, so do not provide us the consumption of each individual.

Individual surveys: these surveys are complicated when the respondent has a large number of foods in his diet or take many intakes outside the home or take many packaged foods which there is no known their composition. Other problem is the underreporting, depending on age, gender and / or cultural level of the sample can result in over or underestimation of intake and some of these populations may have more problems performing surveys. Currently have developed a study, ANIBES, which aims to minimize this problem, has used new technologic with the possibility for "real-time" recording at eating events.

On the other hand, there are some foods that are difficult to register in a dietary survey, among them we can highlight: water, oil, bread, salt and alcohol.

Another common limitation to all individual surveys is the degree of abandonment that can be produced by the sample during the study.

Because of these limitations is important to remember that data gathered using these instruments are prone to measurement error (the difference between the true value of a parameter and the value obtained from the reported dietary intake). Knowing how to deal with measurement error is critical.

Actual status

Europe

Currently there are different sources of information about food consumption in Europe. Among them we can highlight:

FAO: *FAOSTAT* Food and Agriculture Organization of the United Nations Statistics Division. Provides time-series and cross sectional data relating to food and agriculture for some 200 countries. Presents a comprehensive picture of the pattern of a country's food supply during a specified reference period. The Food Balance Sheets domain covers: production, trade, feed and seed and waste, other utilization: food availability, elements covered: quantities, calories, proteins and fats[4].

Nutrition assessment. *Nutrition Country Profiles*. FAO publishes Nutrition Country Profiles which provide a comprehensive review of the food and nutrition situation in developing countries[5,6].

DAFNE: Data Food Networking system - The DAFNE databank is based on information collected in the context of HBS. HBS are periodically conducted by the National Statistical Offices of most European countries in country-representative samples of households. The methodology followed is uniform enough to allow between countries comparisons following minimal adjustment only[7,5].

European Nutrition and Health Report 2009. The aim of the European Nutrition and Health Report 2009 is to provide a comprehensive view of the health and nutrition status in the European Union (EU)[8,5].

EFCOSUM: The aim of EFCOSUM was to define a method for monitoring food consumption in nationally representative samples of all age-sex categories in Europe in a comparable way. Additionally, the project aimed to indicate how to make existing food consumption data comparable and available to the health monitoring system (HIEMS)[9,5].

EFCOVAL: European Food Consumption Validation. Aims to further develop and validate a trans-European food consumption method to be used for estimating the intake of foods, nutrients and potentially hazardous chemicals within the European population[10,5].

The European Prospective Investigation into Cancer and Nutrition (EPIC) study is one of the largest cohort studies in the world, with more than half a million (521.000) participants recruited across 10 European countries and followed for almost 15 years.

EPIC was designed to investigate the relationships between diet, nutritional status, lifestyle and environmental factors, and the incidence of cancer and other chronic diseases.

This study used a classification system of international food, distributing food to 17 different levels and is recommended in many studies. EPIC SOFT software was developed.

PANCAKE: Pilot study for the Assessment of Nutrient intake and food consumption among kids in Europe, the aim was to develop, test, and evaluate tools and procedures for a future harmonized pan-European food consumption survey (EU Menu) among infants, toddlers, children (upto ten years), and breastfeeding women[11,5].

SENECA: Survey in Europe on Nutrition and the Elderly. A Concerted Action. This study was an international, multi-centric longitudinal cohort study from 1988, in an attempt to analyze these factors in various food cultures of Europe in elderly people[12,5].

To obtain these food consumption is necessary to have **identification systems, classification and description of food**.

LanguaL the International Framework for Food Description. It is an automated method for describing, capturing and retrieving data about food. Since 1996, the European LanguaL Technical Committee has administered the **thesaurus** who provides a standardized language for describing foods, specifically for classifying food products for information retrieval.

LanguaL is a multilingual thesaural system using facetted classification. Each food is described by a set

of standard, controlled terms chosen from facets characteristic of the nutritional and/or hygienic quality of a food, as for example the biological origin, the methods of cooking and conservation, and technological treatments[13,5].

Many different systems to systematically define food items are available. It is important to remember that classification is a point of view and it is necessary to think that level is to conduct the study to find out what classification system used (individual, HBS or food balance sheets).We can classify foods in relation to many aspects as may be:

- Food additives (CIAA, Codex Alimentarius GSFA)
- Pesticides (Codex Classification of Foods and Feeds, CCPR)
- Contaminants (Codex Classification for Contaminants and Toxins, GSC)
- EC Common Nomenclature, PRODCOM (Eurostat), World Trade, Organization, ...
- Global Product Classification (GS1 GPC, GSDN Food and Beverage Extension)
- European Food Groups (Cost Action 99/EFCOSUM) and EFSA Food Categorization (Concise European Food Consumption Database)
- Food Composition Databases (EuroFIR classification)[14,5].

And many other classifications

At the European level can be highlighted:

Eurocode 2 food classification: To serve as a standard instrument for nutritional surveys in Europe and to serve the need for food intake comparisons[15,5].

EFG European Food Groups includes 33 groups: The European Food Groups (EFG) classification system was developed, as a project of COST Action 99/ Eurofoods, in an attempt to evaluate the level of food description and classification that would permit international comparisons of the results of available food consumption and food availability surveys. In order to formulate the EFG system, several classification schemes used for recording food intake at the international and national classification schemes were compared: International - FAO Food Balance Sheet, WHO GEMS/ FOODS regional diets, DAFNE classification system for HBS data, and Eurocode 2 core classification (levels 1 and 2); National - French National Food Consumption Survey (1999), Dutch National Food Consumption Survey (1998), and British National Food Survey. In the process of comparing food intake data from various European countries, it became evident that such comparisons are feasible only when results are expressed at the raw ingredient level. Since the DAFNE classification system groups food items at the raw level, it was one of the international classification schemes used to create the EFG food grouping system[16,5].

CIAA and EUROFIR food classification. These terms are for classification only[15].

FoodEx2 - In an effort to introduce standardized food nomenclature across pan-European data collection activities, a Working Group including EFSA staff and external experts was established to develop a suitable .Food classification and description system FoodEx 2, new system of classification and coding of foods that allow the use of consumption data from different countries of the EU[17,5].

In the EU, there is no requirement regarding the collection of data on food consumption of individual character. However, there are national dietary surveys in many European that provide valuable information for use in national policies and are critical for assessing the nutritional status countries. Among the national surveys in countries of the European Union carried out in recent years are:

Germany (14–80 years old, 2008)
Austria (18-65 years old, 2008)
Finland (25-74 years old, 2008)
France (3-79 years old, 2007)
Ireland (>18 years old, 2008)
Holland (7-69 years 2010)
UK (>1.5 years old, 2010)[18].

Spain

Bases previously discussed can be used to meet food consumption in Spain, but also find specific sources for the country.

Different valuable dietary surveys have been conducted in Spain. Briefly, the first Food Consumption Survey was performed in 1956 under the National Health Survey. Among them:

INE (National Statistics Office),**The Household Budget Survey (HBS):** the survey provides annual information on the nature and destination of consumption expenses, as well as on a range of features relating to household living conditions.

Consumption expenses refer both to the monetary flow into the home for paying for specific final consumption goods and services, and to the value of goods received for self-consumption, self-supply, payment in kind, free or subsidized food and rent of the dwelling in which the household lives (where it is owned or it is granted by other households or institutions). Expenses are recorded at the time of acquisition, irrespective of whether payment is in cash or in instalments.

The sample size is approximately 24,000 households per year. Each household remains in the sample for two consecutive years, with half of the sample renewed each year.

Since its implementation in 1958, there has been an alteration in the different types of surveys that tried to collect the information needed at each moment.

The survey provides estimates of annual consumption for the entire country and the Autonomous Communities, and of consumption in physical amounts of certain food goods for the country as a whole[19].

The HBS has representativeness by municipalities, geographic, population, basket, shopping areas, establishments, for items, price trends should be similar to the rest of the items they represent, should be consumed regularly, easily observable prices with reasonable assurance of continued market.

The choosing criteria the establishments is the most frequented and largest sales volume in each establishment cannot pick up on the same day, more than one price per item and an establishment should not concentrate a large number of observations prices. The sample establishments are not part restricted and should provide continuity of sales items. The classification used to collect expenses is COICOP, which is the national adaptation of the international classification used by Eurostat for budget surveys (COICOP/HBS), and which is structured in twelve groups:

Items are added into subclasses, these classes, subsequently into subgroups, and last subgroups into groups.

The structure consists of 12 categories or groups, 37 subgroups, 79 classes and 126 subclasses, which include a total of 489 items. The number of items has been changing since the beginning, in 1936 the basket was between 95 and 139 items[19].

The results of this survey can be accessed through the INE websitehttp://www.ine.es/jaxi/menu.do?type=pcaxis&path=/t25/p458&file=inebase.

The processing of data from this survey gave rise to National Food and Nutrition Survey (ENNA 1, 2 and 3) which includes the conversion into energy and nutrients from food purchased in households the Spanish population[20].

Ministry of Agriculture, Food and Environment MAGRAMA: **Food Consumption Panel:**

The Food Consumption Panel, conducted for over 25 years (since 1987) by the Ministry of Agriculture, Food and Environment MAGRAMA, has as one of its goals the study of food consumption in households and commercial establishments and social restoration in Spain and represents a very detailed food shopping map in Spain[21].

The sample size in 2013 was 12,000 households which daily pointed their shopping with an optical reader. The choice of this sample is random with a two-stage method. In the first stage, survey points were selected based on population size for each of the regions. In the second, the collaborators is selected on each of the chosen points.

In 2011, there was a change census which was first used the panel to show food consumption data from the year 2013. In that year coexisted both censuses. The extra-household panel consumption was modified in 2012, showing weight/year, volume/year, units/year per capita, to show the impact of the different products studied and the evolution of these.

As in the previous case the results of the consumer panel can be viewed on the website of MAGRAMA (http://www.magrama.gob.es/es/alimentacion/temas/consumo-y-comercializacion-y-distribucion-alimentaria/panel-de-consumo-alimentario/ultimos-datos/).

Traditionally MAGRAMA published their results in an annual text entitled "Food in Spain" which was annexed a section that valued nutritionally diet "diet food", but since 2000 the data have been treated since the Spanish Nutrition Foundation who has done various publications:

- Nutritional Assessment of the Spanish diet according to the Food Consumption Panel.
- Consumption evaluation enriched / fortified foods in Spain through the Food Consumption Panel (Spanish Nutrition Foundation. FEN).

National Health Survey of Spain by the Ministry of Health Social Services and Equality in collaboration with the National Institute of Statistics, collects health information on the resident population in Spain (21,508 households). It is a five-yearly research that allows to know many aspects of the health of citizens at national and regional level, and to plan and evaluate interventions in health care. Among the information collected is food consumption[22].

At national level, the current AECOSAN (Spanish Agency for Consumer Affairs, Food Safety and Nutrition) recently carried out:

ENIDE National Survey of Dietary Intake (2009-2010). AECOSAN has performed a nutritional assessment of the Spanish adult population, the objective was to determine food consumption in Spain and, more specifically, to determine the patterns of dietary intake in the Spanish adult population of both sexes[23].

ENALIA It is a food survey involving children and adolescents aged 6 months to 17 years of all the Autonomous Communities. It is an individual survey, which identifies the exact type and quantity of food consumed, which is essential to assess the nutrient intakes and for scientific research on exposure to other chemicals through food[24].

ENALIA 2 (children and adolescents / adults and elderly).This study, continuation of Enalia survey, includes adults between 18 and 75 years from all the Autonomous Communities and a group of pregnant women. It is an individual survey, which identifies the exact type and quantity of food consumed, which is essential to assess the nutrient intakes and for scientific research on exposure to other chemicals through food[25].The latter updates the reference survey in Spain in children and young people (2-24 years old) called **EnKid**, and the **AVENA** study, a multicenter nutrition survey in Spanish adolescents**.**

At regional level, other valuable and representative surveys have been conducted: The Region of Madrid, which has been recently updated by FEN (**ENUCAM** Survey of eating habits in the Region of Madrid), Catalonia (**ENCAT.** Evaluation of the state nutritional of Catalan towns 2002-2003. Evolution of eating habits and

food consumption and nutrient Catalonia (1992-2003)), the Region of Valencia (**Nutrition Survey of the Community of Valencia**), Galicia (**Survey on the eating habits of the adult population of Galicia,** 2007), Basque Country (**EINUT-1**. Nutrition Survey of the Autonomous Community of the Basque Country), Andalusia (Nutritional Survey of Andalusia) among others.

Other surveys are **UNINUT** (Study of eating habits and lifestyles of Spanish university), **ANIBES** (Study on Energy Balance in Spain) (in press), **ENRICA:** Survey of Nutrition and Cardiovascular Risk in Spain, Survey **of Child Nutrition Community of Madrid, SUN Project, PREDIMED**: "Effects of the Mediterranean diet on the primary prevention of cardiovascular diseases".

Perspectives

European Food Safety Authority (EFSA) promotes and coordinates data collection standardized food consumption and is working with Member States to develop harmonized surveys on food consumption in the European Union. Thereby the studies are comparable, allowing use at the community level. Thus, EFSA has published a guide to conducting surveys in a European context and other documents on classification and coding of foods in addition to the database "Comprehensive Food Consumption Database" with detailed data from individual surveys in several countries EU.

In this sense it has been developed "The food classification and description system FoodEx 2", a new system of coding and classification of foods that allow the use of consumption data from different EU countries for different purposes: risk assessment, nutritional studies and any other needs that may arise in the future.

The EU Menu is a project aimed at harmonizing data collection on food consumption across Europe. Co-ordinated by EFSA, and in close co-operation with Member States, it will allow the collection of comparable food consumption data across the EU.

Although national dietary surveys are already conducted in many European countries, it is not currently possible to carry out EU-wide analysis or country-to country comparisons on food consumption due to differences in how information is collected.

The EU Menu aims to provide standardized information on what people eat in all countries and regions across the EU. It will allow more efficient and accurate exposure assessment and support risk managers in their decision making on food safety. It will also assist policy makers in assessing the nutritional status of population groups, setting targets regarding healthy diets and monitoring progress over time. In that way, the EU Menu will contribute to safer food and healthier diets for European citizens.

In February 2010 members of EFSA's Advisory Forum signed a declaration supporting the establishment of a pan-European food consumption survey[26].

Applications

Knowledge of food consumption either national, household or individual surveys may have numerous applications: identifying food patterns and sources of nutrients, explore the quality of food and evaluate the dietary exposure to risks. It can also be used to meet the nutritional status, although it is not possible to have an accurate idea exclusively from dietary data, the results of the dietary survey do allow to have intakes on the possibility that a person or a group at risk for having inadequate intakes of energy and nutrients.

Once you know food consumption, it becomes intake of energy and nutrients through the databases of food composition and subsequently compared with those recommended for judge the adequacy of dietary intakes. In addition, the calculation of different indices of quality diet can have a global idea of nutritional status, judged by diet and these data can be used to update the current recommendations of energy and nutrients.

Transform food consumption into energy and nutrients to assess the nutritional status of the individual or group study is the most used application from the FEN.

The sources used by FEN are HBS and more recently Food Consumption Panel. Both provide food consumption in weight/year, volume/year or units/year measurements and transformation in g/person per day is done: discounting an inedible portion all food and performing a "correction" in the case of vegetable oils (-20%).

The first was used for the realization the "National Study of Nutrition and Food (ENNA 1, 2 and 3)" and the second "Food Diet" (MAGRAMA), "Nutritional Assessment of the Spanish diet according to consumer Panel (2008 and 2012)" and "Evaluation of the use of enriched/fortified in Spain through food Consumption Panel". table I provides a summary of the characteristics of both sources and table II shows the strengths and weaknesses.

Recommendations

There are numerous sources of information on food consumption, but the diversity of designs and data collection methods of the studies difficult to evaluate and compare them. Therefore, it is necessary to work at European level in the standardization of data collection, since the complexity both individually and in population nutrition studies, requires models agreed questionnaires and tools to facilitate the identification of information collection, for this is precisely comparable across countries.

In relation to individual surveys should continue working on the use of technologies to easily record the intake at the time of consumption.

Regarding the Spanish data, the coexistence of two databases (Food Consumption Panel, HBS) contribu-

Table I
The Household Budget Survey (HBS) and Food Consumption Panel

	Food Consumption Panel	*The Household Budget Survey*
Beginning	1987	1939
Frequency	Annual	Quarterly
Population scope	Households, hotel industry/restoration and institutions	Family homes, commercial areas and establishments (excluding institutions)
Geographic scope	Peninsula, Baleares y Canarias	National territory
Sample size	12.000 households	24.000 households
Criteria breakdown	Geographic areas and autonomous Household socioeconomic status Habitat size Family size Age and activity of responsible for purchasing Presence ofchilds	Autonomous Community Province Size of the municipality Household composition Household Income Level Educational level of the main breadwinner Quarter Survey
Number of foods	130 food staples disaggregated in 416 inputs (quantified by weight)	187 foods 66 (quantified by weight)

Table II
Strengths and weaknessesin the Household Budget Survey (HBS) and Food Consumption Panel

	Strengths	*Weaknesses*
Food Consumption Panel	Consolidate Annual Representative Includes a large amount of food Reliable information Allows study the evolution of feed Data freely distributable	No studied Ceuta and Melilla Since 2011 not collect kg / person per day in catering and institutions Food waste is not evaluated Not allowed value according to age or sex Database change Not include energy and nutrient content (unless Evaluation of food consumption and dietary patterns in Spain by the Food Consumption Survey) Provides information on a group but does not show the real value of each individuals
Household Budget Survey	Consolidate Quarterly Weighted Includes database changes International classification (COICOP) Representative Entire country Reliable information Allows study the evolution of feed Data freely distributable	No includes all food quantified by weight They exclude institutions Food waste is not evaluated Not allowed value according to age or sex Not include energy and nutrient content (unless National Food and Nutrition Survey ENNA) Provides information on a group but does not show the real value of each individuals

tes greatly to show a good picture of feeding of the Spanish people, however, as in Europe, it must follow a set of coding and classification of unique foods, to make better comparisons.

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