Working party 2 session: nutrients and foods

Food availability and consumption data

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Keywords
food consumption, food availability, dietary intake, nutrition policy

The objective of the presentation was to determine to what extent data on diet and nutrition, which are collected in a non uniform manner, could be harmonised and pooled for international and national comparison, and to analyse the use and misuse of food data in nutrition policy planning and monitoring.

Direct comparisons of dietary data between studies were made using food balance sheets (FBS), household budget surveys (HBS) and individual dietary data (IDS) included into a WHO-CINDI recent comparative analysis of food data. Differences in study design and methodological approaches were investigated. Data from different countries, Canada, Finland, Poland and Spain, were analysed. FBS overestimated food consumption and nutrient intake compared to IDS; results between HBS and IDS were quite similar, except for fish, meat, pulses and vegetables that were underestimated by HBS, and sugar and honey and cereals that were overestimated. Percentages of energy from fat, carbohydrates and proteins were higher when estimated from FBS, HBS and IDS respectively.

Knowing food and nutrient availability is a very important step in developing dietary guidelines, since average individual consumption levels will only be reached if they are available nationally and on a household basis. If available levels of foods are higher than the desirable individual levels, nutrition education may have a major role in the nutrition policy. Otherwise, if apparent levels are lower than recommendations, promotion of supply or trade may be a priority in the policy. Also, the level of food information required from a nutrition intervention perspective will depend on the scope of the intervention. If the scope is to promote dietary changes at household level, by education or price interventions, HBS may be the best dietary tool for monitoring changes. If the scope is to promote national food supply changes by legislation, agricultural incentives or international trade, FBS will be the most appropriate tool. However, if interventions are aimed at changing the nutritional status of individuals through education, fortification or supplementation, IDS together with anthropometrical and biochemical indicators will be the most appropriate tools.

Estimations from these three sources of dietary data are difficult to compare since they are measuring different levels of dietary information. The understanding of their relationships may be important in formulating and evaluating a nutrition policy.

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Analytical approaches to food-based dietary guidelines

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Keywords
food-based dietary guidelines, quantiles, discriminant analysis, cluster analysis, factor analysis, inter-individual variability, food consumption survey, nutrient intake, food sources

Food Based Dietary Guidelines (FBDG), in order to be attainable, should take into account the cultural context of the population for which they are developed. They need to focus on foods that actually determine the intake of nutrients for which desirable changes have been identified.

The objective of the present paper is to describe how statistical techniques can provide useful information for the identification of these "key foods" by using food consumption databanks available in the EU.

Examples of different techniques are provided. Useful information may be easily obtained by comparing the highest quantile of intake of a selected nutrient with its lowest quantile or by calculating the correlation between the total intake of a nutrient and the intake of its food sources. These simple techniques allow us to identify foods that explain a high proportion of inter-individual variability in nutrient intake. Advanced techniques such as discriminant analyses, cluster and factor analyses consider the complexity of the dietary pattern.

It is stressed that no result of statistical analysis can be interpreted without a scrupulous analysis of the quality of data that describe food and nutrient intakes in the population. The main potential sources of bias are described (food consumption survey technique, under-reporting by subjects, quality of food composition tables) together with possible adjustments such as that for energy intake.

Once key foods are identified, several strategies are available to modify patterns of intake in the population: through changes in the percentage of consumers / in the mean portion size / in the frequency of intake.

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An example of developing food based dietary guidelines

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Keywords
food based dietary guidelines, cultural context, total fat intake (% energy), % consumers

Objectives and methods: The term "Food-Based dietary guidelines" is used to mean the expression of the principles of good nutrition as foods. Guidelines derived from nutrient targets or dietary

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goals are translated into "food-based" guidelines in order to be adopted by the general population. Thus, FBDG should be based on customary dietary patterns and should take socio-economic and cultural factors into account. This presentation outlines, using the example of total fat intake (% fat energy), approaches for developing FBDG in cultural context. Total fat was chosen as a nutrient of public health significance. The process can be described by a series of steps with increasing levels of complexity.

Results and conclusions: Various methods for developing FBDG are described using total fat (% energy) as an example. The choice of method used is, in part, determined by the nature of food intake data for a given population. More advanced analytical approaches can be used when sufficiently detailed and validated data for the distribution of intakes within the population is available. When formulating FBDG consideration must be given to the data quality (i.e. level of under-reporting) as well as relevant social, economic, agricultural and environmental factors influencing food availability and eating patterns. In addition, consideration should also be given to the compatibility of any newly formulated FBDG with co-existing guidelines.

A European food consumption survey method

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Keywords
comparability, Europe, food consumption, methodology, survey

The assessment of the role of diet in health in Europe requires a thorough analysis of the patterns of food and nutrient intake across European countries. In the final report of SCOOP Task 7.1.1.(1997)[1] in which 14 European States participated, it is concluded that there is a regrettable lack of internationally comparable dietary intake data. At present there are several European initiatives to improve the comparability of national food consumption data, such as the DAFNE project and the EPIC study. Each of these projects is carried out in a different subset of Member States, in different population samples and has different aims. The progress produced in each of these projects could form the starting point for a truly European food consumption surveillance, delivering internationally comparable data on individual consumption on a regular basis in nationally representative samples.

The EU Programme on Health Monitoring aims to contribute to the establishment of a Community health monitoring system which makes it possible to measure health status, trends and determinants throughout the Community, to facilitate the planning, monitoring and evaluation of Community programmes and action, and to provide Member States with appropriate health information to make comparisons and support their national health policies. One of the projects within this Programme is the project on a European Food Consumption Survey Method (EFCOSUM), which aims to define a (minimum) set of dietary components which are relevant determinants of health. Moreover, the study aims to define a method for the monitoring of food consumption in nationally representative samples of all age-sex categories in Europe. This method will be used alone or as calibration method for ongoing studies. Furthermore, the project will ensure datafusion with other health monitoring studies.

The project is carried out by 14 Member States as well as 8 other European countries and started in January 2000. Crucial information on national food consumption surveys of all participants is collected. Relevant information from COST99, EPIC and DAFNE forms the basis for future activities. These activities are carried out in four working groups:

1) comparability of food intake assessment; 2) comparability of food composition tables; 3)

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software and statistics; and 4) operationalisation of a European food consumption surveillance. Deliverables of the project will be a protocol for collecting dietary intake data for monitoring purposes on a national level, with a method that provides internationally comparable results (including calibration of existing methodology). Moreover, the project will produce a method for efficient and accessible distribution of the data, as well as for uniform presentation and analysis of the data, and specifications for the necessary software tools.

At the request of the Programme Committee an investigation will also be made regarding the possibilities of making the existing data more comparable and to advice on how to do this. However, participants anticipated that this will result in a suboptimal situation. Therefore, it is strongly recommended to collect new data with one pan-european method in the future. Furthermore, participants agreed that foods are as important as nutrients, and that both acute and habitual intake are essential.

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The DAFNE (data food networking) databank. A tool for monitoring trends in food habits in Europe

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Keywords
household budget surveys, food availability, Europe, DAFNE databank

Objective: To develop a European, regularly updated databank of comparable food and socio economic information.

Methods: Nationally representative data on food, demographic and socio-economic parameters collected in the household budget surveys (HBS) of ten European countries (Belgium, Germany, Greece, Hungary, Ireland, Luxembourg, Norway, Poland, Spain and the United Kingdom), were incorporated in the DAFNE database.

Food data were classified under 45, common between countries, food groups, which can be further aggregated to form 12 main food groupings. Selected socio-demographic and related variables were also rendered comparable. The SAS Statistical Package was used for the estimation of the mean daily food availability of the overall population, as well as for segments of the population with specific socio-economic characteristics.

Estimates of food availability, as derived form the DAFNE databank, were compared to food consumption values, collected in the context of specifically designed individual nutrition surveys.

All food and socio-economic information available in the DAFNE databank was integrated in a user-friendly software programme, operating in Windows environment, the "DafneSoft". The "DafneSoft" and relevant DAFNE publications can be downloaded at: www.nut.uoa.gr

Results: The "DafneSoft" programme allows the user to follow the availability of numerous food items within each of the 10 participating countries, to compare food availability between countries and to further display results in the form of tables, bar and pie charts and atlas presentations.

The DAFNE databank indicates that disparities in food habits exist among European countries. These disparities have both qualitative and quantitative elements, while systematic trends have been identified, when the households' socio-economic characteristics are taken into consideration.

Comparisons of the DAFNE data with information collected in food consumption surveys reveal that, given the inconsistencies

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present in both, the two sources of dietary information are compatible in describing the food habits of the studied populations.

Conclusion: The DAFNE databank allows comparisons of food availability in Europe, provides a mean for monitoring trends in the dietary choices of the Europeans and allow the identification of factors that may be related to food choice.

The DAFNE databank can prove to be a tool in the hands of nutrition policy makers, since it can provide the background for the development of dietary recommendations and further monitor their applicability and adaptability by the general population.

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A mathematical model as a tool to derive nutritionally balanced and need-oriented dietary recommendations

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Keywords
food-based dietary guidelines; nutritional targets; group-specific recommendations; operations research; mathematical model

Food-based dietary guidelines (FBDG) are considered as a more effective means than nutrient-based guidelines to urge the European population to change nutritional behaviour and to accept healthy nutrition. However, their applicability and long-term benefit for individual subjects will improve if they (1) are tailored to the specific needs of an individual, (2) give clear recommendations for food choice, (3) avoid excessive regulation by a strict dietary plan, (4) take into consideration consumer attitudes to food quality and price. It is not a simple task to achieve these different targets even more taking into account the multi-cultural background within the European populations. Usually, a scientific-based empirical approach is used to derive FBDG and to develop examples of food and meal patterns applicable in a more healthy nutrition.

A better approach to develop optimised FBDG is to use operations research methods. This methodology takes into consideration a lot of different specific variables such as individual or group-specific needs, seasonal and regional influences, social, economic and cultural conditions. Using a data base on nutrient composition of foods the mathematical algorithm calculates a variety of optimal food patterns according to the given nutritional targets, e.g. reduced fat or cholesterol intake, high consumption of fruit and vegetables, low price etc.

The benefit of operations research will be demonstrated for different variants of food consumption. A 4-part linear standard model considering 12 nutritional variables and more than 100 food and meal patterns will be presented. The model can easily be extended. As a result examples of dietary recommendations for children and adults are derived showing upper and lower limits of nutrient intake for different dietary and physical conditions and possibilities on how to exchange and combine different food groups.

These mathematical models may be used as an approach to develop and to optimise FBDG in the European countries.