



The Data Food Networking (DAFNE) initiative
EUROPEAN FOOD AVAILABILITY DATABANK BASED ON
HOUSEHOLD BUDGET SURVEYS

Final Activity Report of the DAFNE IV project

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A. Introduction

In 1997, the European Union (EU) set up a programme of action aiming at establishing a Community Health Monitoring System that would provide information for measuring and monitoring health status in the EU. Nutrition, together with physical activity, have long been recognized among the determinants of the populations' health (1,2). Dietary habits are multidimensional, shaped by several factors operating through various directions. A proper, however, understanding of overall food choices is necessary for providing nutrition guidance. Dietary advice needs to take into account the combinations of different food items that people choose to eat together, as consumers rarely consider the nutrient content when choosing food.

Although several publications present dietary patterns among specific population groups, few attempts have been made to record and describe dietary patterns at an international basis and in a harmonized approach (3). In addition, the limited comparability of the samples and the methods used in the various national studies have hindered conclusions at an international level (4). There is, however, a need for data that would provide a regular and comparable flow of dietary information, which will support the planning and evaluating of strategies and actions at the national, regional and Community level.

The Data Food Networking (DAFNE) initiative

The European Commission (EC), in the realm of actions in the field of public health, emphasized on the importance of standardized and comparable dietary data and the promotion of nutrition surveillance systems in Europe. Within this context, the DAFNE initiative has for the last 13 years been supported by the EC in order to develop a European nutrition monitoring system, based on data collected through the nationally representative household budget surveys (HBS). The DAFNE initiative has been successful in creating a cost-effective databank of currently 16 European countries. The databank allows the assessment of trends in the food habits of European populations, as well as comparisons between population sub-groups defined according to their demographic and socio-economic characteristics.

Since 1987, the National Nutrition Center in Athens, Greece, has organized a series of workshops, seminars, and research activities aiming at the development of the most

appropriate way of using food and socio-demographic data from the national HBS. This approach was granted financial support by the EC, through the DAFNE I, II and III projects, in order to develop the methodology for harmonizing the HBS data of the following European countries: Belgium, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Norway, Poland, Portugal, Spain and the UK (5,6,7). In an attempt to better understand and deal with the limitations of the HBS data, information retrieved from the DAFNE database was used in order to compare the HBS-derived food data with those collected through specially designed nutrition surveys (*the FAIR-97-3096 project: "Compatibility of the household and individual nutrition surveys in Europe and disparities in food habits"*). The methodology was developed for rendering the two types of dietary data comparable, at the level of the information collected and comparisons showed that household budget and specially designed nutrition surveys generate broadly comparable results (8).

Over the years, the DAFNE databank has been recognised as a tool to follow-up trends in nutritional practices (9); to identify population subgroups whose dietary habits are not favourable according to the current scientific knowledge on the association of diet and health (10); and to outline preventive interventions in order to support consumer choices towards a healthy nutrition (11).

The DAFNE IV project

The "European Food Availability Databank based on Household Budget Surveys – DAFNE IV" project was aiming at:

- ◆ assembling and harmonising national HBS datasets from the following five EU Member States: Austria, Finland, Germany, Portugal and Sweden. The newly harmonised datasets would be incorporated in the DAFNE database, which would ultimately form a bank of food data from multiple HBSs undertaken in each of 16 European countries (15 EU Member States and Norway).
- ◆ developing the methodology for estimating the daily availability of selected nutrients, using food data from the national HBSs. The proposed methodological approach would be pilot tested and applied on the data of the Greek HBS

undertaken in 1981-82, 1987-88 and 1998-99, which are already stored in the DAFNE database.

- ◆ compiling a protocol for collecting, in the context of the HBS, information on meals taken outside the household, addressing thus a limitation in the use of HBS data for nutritional purposes.

To better employ the potential of the DAFNE database and to ensure an efficient dissemination of the results, the coordinating center integrated the DAFNE data in a user-friendly application tool, the *DafneSoft*. The programme allows the user to monitor dietary choices and patterns within and between countries and to follow trends in food availability in Europe, using data presented in tables, bars, pie charts and maps. The tool further allows for cross-linkages of food availability data with socio-economic and demographic indicators. To ensure its efficient dissemination, the *DafneSoft* programme is directly accessible through the website of the DAFNE coordinating centre (www.nut.uoa.gr).

B. Material - Methods

Material

The DAFNE IV project was aiming at enriching the DAFNE databank with harmonized information from 5 EU Member States. The year and the procedures of data collection and storage, the methodological characteristics and other general information regarding the datasets which were integrated in the context of the DAFNE IV project are presented in Annex I. The information included in Annex I summarizes the results of an inventory disseminated to all data providers, with the objective to understand the methodological attributes of each dataset and to evaluate the feasibility of comparisons between the participating countries.

In the case of Austria, only one HBS dataset (that of 1999-2000) was provided to the coordinating centre and was accordingly analysed. According to the project's Technical Annex, the Austrian participants contacted their National Statistical Office for the provision of the three most recent HBS datasets. They were, however, informed that methodological changes were decided and applied for the first time in the HBS of 1999-2000, limiting thus the comparability of previous datasets with this last one. Since this new methodology will now be routinely applied by the Austrian Statistical Office, participants agreed to harmonize and analyze only this more recent dataset. The thus developed methodology can be directly applied, as soon as new data become available.

In the case of Portugal, the Portuguese HBS data collected in 1990 and 1995 were analyzed in the context of the DAFNE III project and results were incorporated in the DAFNE databank. A new, third set of HBS data collected in 2000-01 was provided and analyzed by the Athens coordinating centre.

Methods

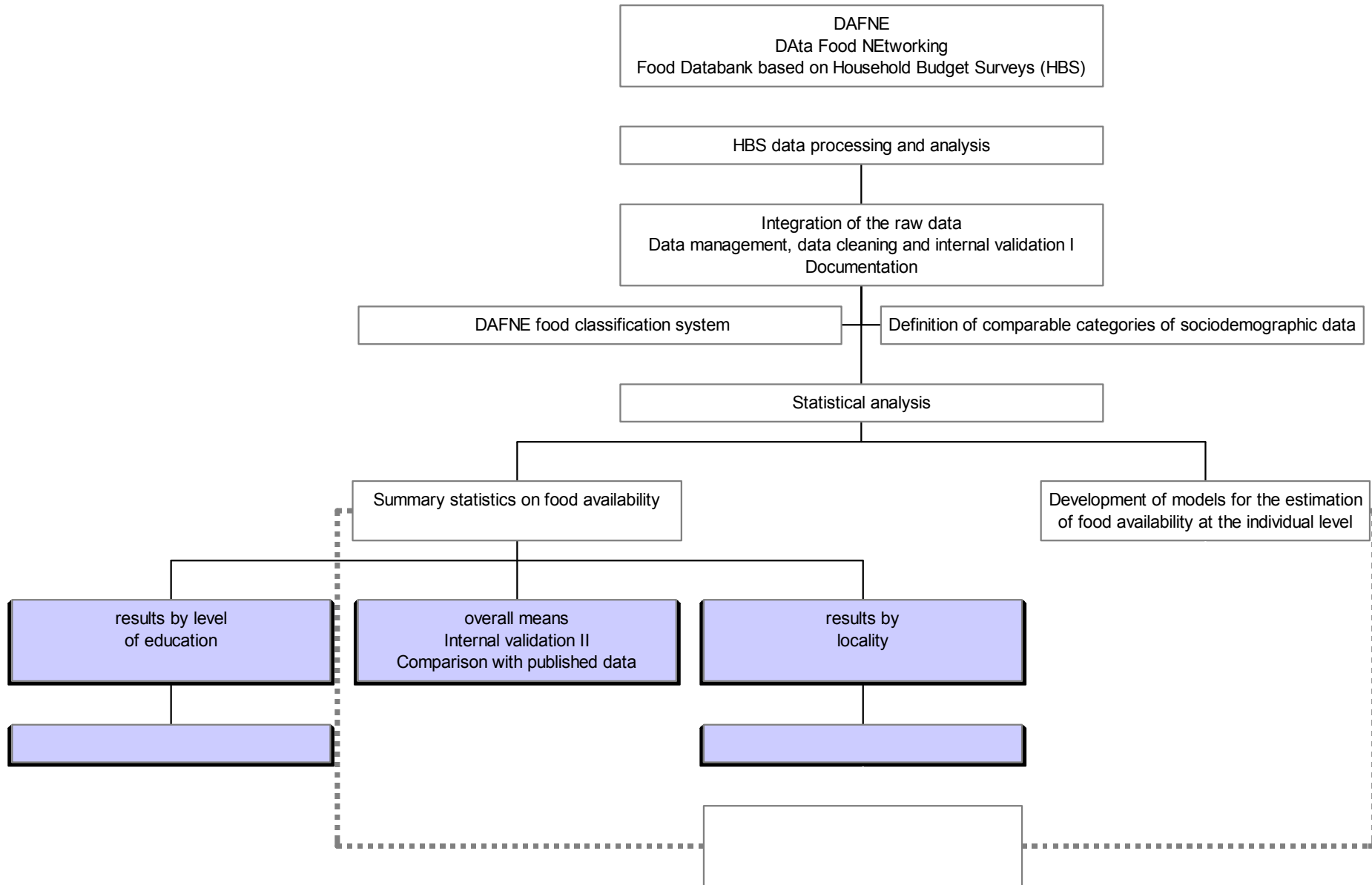
The tasks undertaken in the context of the DAFNE IV project can be summarized in the following:

Integrating new datasets in the DAFNE databank

Tasks 1-5, as well as their interrelations are presented in a Pertt diagram (Figure 1). In brief, the procedures included the:

- ◆ management and processing of the raw food, demographic and socio-economic information collected in the HBS of the participating countries
- ◆ documentation of the HBS variables, which would be used in the analysis
- ◆ incorporation of the raw HBS data of each participating country in the central database, operating at the coordinating centre
- ◆ harmonization of the food, and socio-demographic information collected in the national HBSs
- ◆ estimation of the average daily food availability for the overall population and for population groups, defined according to socio-demographic indicators.

Figure 1: The Household Budget Survey data processing and analysis in the context of the DAFNE initiative



Management, Processing, Documentation and Incorporation of raw HBS data of each participating country in the central database

All datasets, together with their file descriptions, were received in the Athens centre. In the majority of the cases, data were stored in ASCII files, with size and structure varying due to different sample sizes and variables provided. All datasets included information at least on the following variables:

1. General information

- household identification number
- trimester of participation

2. Nutritional information (purchases, own production and gifts)

- food code
- total food expenditure (food expenditures outside the household included)
- expenditure per food item
- expenditure for meals out of home
- amounts per food item

3. Socioeconomic information

- degree of urbanisation of household (urban, rural , semi-urban)
- number of inhabitants in the area
- population density of the area
- name of geographical area where the household is situated
- household size
- age and gender of household head and members
- relationship of household members with the household head
- household disposable income (net income)
- household total expenditure
- occupation / employment status / economic activity of household head and members
- education of household head and members
- income of household head
- medical expenses data
- type of acquisition (purchases, own production and gifts)

The well understanding and correct reading of the data by the DAFNE coordinating team was evaluated through samples of random households which were sent to each country for cross-checking. Before finalizing the data integration in the central DAFNE database, the Athens team proceeded to checking of the data consistency by:

- estimating range of values
- evaluating the agreement between overlapping variables (e.g. age given in discrete years and in age groups)
- cross-tabulating categorical variables with connected content (e.g. the age of the household head and his/her employment status).
- identifying and estimating missing data for the variables that would be considered in the analysis.

The raw DAFNE data are stored and maintained in a Microsoft SQL Server 2000 DBMS on a Windows 2003 Server Operating System. For the verification and cleaning of the data, a visual FoxPro tool was used. The data are stored per country/per survey year. The raw DAFNE data can be queried by users who login through the Department of Hygiene and Epidemiology's VLAN. Any user, except the Administrator, has only "view" privileges.

Harmonization of the food, demographic and socio-economic information collected in the national HBSs.

The DAFNE food classification scheme

The development of a common classification system that would allow international comparisons of dietary data is a central element in the development of a European food databank. In the DAFNE project, the process of post-harmonisation included the establishment of operational criteria for the classification of the national food codes, iterative cross-coding, as well as several working group meetings and bilateral visits to address specific problems. This harmonisation procedure has resulted in the *DAFNE Food Classification System*, which allows grouping the HBS-collected food data into 56 common subgroups, which can be further aggregated at various levels ending up at 15 main food groups (Table 1).

In accordance to the DAFNE procedures, the Athens team has been closely collaborating with nutritionists from each country participating in the DAFNE IV project in classifying the recorded food variables under this comparable between countries scheme. All food classifications, separately for each of the HBS dataset analysed in the context of the DAFNE IV project are included in Annex II.

The description, in an operational manner, of the application of the DAFNE food classification system in all the 16 countries of the network (Austria, Belgium, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Norway, Poland, Portugal, Spain, Sweden and the UK) has recently been published with the support of DG-SANCO, Directorate C2-Health Information. (12). In this publication, the DAFNE classification scheme is presented in the forms of tables, specific for each country and survey year, and can thus serve as a basis for the integration of foods in a platform, which can conform to the European dietary habits and needs and can contribute in making European food data interoperable.

Table 1: The DAFNE Food Classification Scheme

Cereal and cereal products	Vegetables
Bread and rolls	FRESH VEGETABLES
Bakery products (bread and rolls excluded)	Green leafy vegetables
Rice, cereals and products (flour and pasta excluded)	Cabbage
Flour	Tomatoes
Pasta	Carrots
Meat, meat products and dishes	Onions, garlic and leek
RED MEAT	Other fresh vegetables
Pork meat (fresh and frozen)	PROCESSED VEGETABLES
Beef, veal and calf meat (fresh and frozen)	Fruits
Red meat, other than pork and beef (fresh and frozen)	FRESH FRUITS
OFFAL (fresh and frozen)	Apples
POULTRY (fresh and frozen)	Citrus fruits
CANNED MEAT AND MEAT PRODUCTS	Bananas
MEAT DISHES	Grapes
Fish, seafood and dishes	Plums
Fish (fresh, frozen and processed)	Berries
Seafood	Apricots and peaches
Fish dishes	Cherries and sour cherries
Milk and milk products	Pears
Milk	Other fresh fruits
Cheese	PROCESSED FRUITS
Milk products (cheese excluded)	Fruit and vegetable juices
Eggs	Fruit Juices
Added lipids	Vegetable Juices
LIPIDS OF ANIMAL ORIGIN	Sugar and sugar products
Butter	Sugar
Animal fat (butter excluded)	Sugar products
LIPIDS OF VEGETABLE ORIGIN	Non-alcoholic beverages
Vegetable fat	STIMULANTS
Margarine	Coffee
Vegetable fat (margarine excluded)	Tea and similar infusions
Vegetable oils	Cocoa
Olive oil	MINERAL WATER
Seed oils (olive oil excluded)	SOFT DRINKS
Potatoes and other starchy roots	Alcoholic beverages
Pulses	Wine
Nuts	Beer
	Spirits

Conversion of food expenditures to food quantities

The food data collected in the HBSs refer to the household's expenses, as well as to the acquired food quantities. However, since the primary aim of the HBSs is the derivation of national price indices, attention is given to ensure the complete recording of expenses and the quantity data are not always complete. In the DAFNE IV project, we addressed this limitation in the Austrian and the German datasets, whereas in the Swedish 1996/97 HBS only data on food expenses were available.

In the Austrian HBS, households recorded the expenses for 88 food items and beverages and the acquired quantities for 81 products. Of these 81 products, quantities available in the households were fully recorded for 58. Information on the quantities of 16 food items was limited, since several households recorded purchasing these food stuffs, but failed to record the acquired quantities. Lastly, only expenses data were recorded for 7 food items.

To deal with this limitation, Statistik Austria recommended the following approach: In cases, where some of the households failed to record the acquired quantity, a *price per unit* (weight or volume) factor was applied. Costs per unit were estimated for each food item, using information from each participating household, and their medians were estimated and applied for converting expenses to quantities. In cases where the estimation of the median cost per unit factor was not feasible, food expenditures were converted to quantity data, making use of information on the Austrian annual market availability provided by the Austrian Statistical Office (13).

The Austrian Statistics advised the following formula for the calculation:

$$\text{Availability in quantity for food}_j = \frac{\text{National Annual Market Availability}}{12} \times \frac{7.098 \text{ hds}}{3.241.338 \text{ hds}} \times \frac{\text{Expenses of hds}_i \text{ for food}_j}{\text{Total expenses for food}_j}$$

where:

7.098: number of households (hds) participating in the 1999/2000 HBS.

3.241.338: total number of Austrian households (hds) in 1999-2000.

In the case of Germany, the Federal Statistical Office did not provide data on the acquired quantities for approximately 30 % of the food codes recorded in 1988 and 1993 and approximately 45 % of the 1998 codes. For these, the German team applied a procedure for converting the related expenses to quantity data. The procedure, which is described in detail in the German national report (submitted as a deliverable of the DAFNE IV project), takes into account the shopping preferences which households of different socio-economic status may have.

In the Swedish 1996/97 HBS, food information was only recorded as expenditures, not as amounts. For the estimation of food quantities, *price per unit* factors were applied. For 589 food items, factors referring to the median monthly prices (cost per unit of weight or volume) were directly available from Statistics Sweden for the year 1996. In the case of items, where no price information was available, retail prices were collected from three supermarket chains and were adjusted to 1996 using the consumer price index. For some remaining food items, it was decided to calculate cost per unit factors, making use of information on the prices of these items, which is available in the 1989 HBS. More specifically, after the HBS food codes were classified under the comparable DAFNE food groups changes in prices were calculated for all the food items that belonged in the same DAFNE group with the item of the unknown 1996 price. Then, the average price change was estimated, it was applied in the price of 1989 and the expected 1996 price of this food item derived. This approach was considered acceptable and was applied in those foods that vary relatively little in price, in their respective food group.

When the HBS food codes were aggregated referring to several food items, it was necessary to firstly identify the percentage contribution that each food item made to the corresponding code. This information was provided from the Swedish Board of Agriculture, the National Food Administration and from published scientific data.

The DAFNE Classification Scheme for socio-demographic data

Several socio-demographic characteristics are recorded in the HBSs and many of them are included in the final roster of variables to be studied. Focus was, however, put on the locality of the residence, the educational status and the

occupation of the household head, and on the household's composition. Variables related to the above characteristics and recorded at national level were classified under common between countries groupings, which were formed through the establishment of operational criteria, and working group meetings and bilateral visits to address specific problems. More specifically:

- Locality of the residence

Using various criteria (e.g. number of inhabitants, population density) the following three categories of locality were formed:

- rural,
- semi-urban and
- urban

- Education of the household head

Though differences in the national educational systems do exist, data on the education of the household head could be classified under three comparable categories:

- Illiterate / Elementary education,
- Secondary education and
- Higher education (College/University).

Among the countries under study, data on the educational status of the household head and members was not routinely collected in the German HBSs of 1988 and 1993 and in the Swedish HBS of 1989.

- Occupation of the household head

Occupation reflects a number of characteristics including education, income and physical activity. If properly harmonized, it can provide a suitable basis for comparison of dietary practices. In the DAFNE IV project, occupation was classified under the five categories below, based on the occupational status and the profession, if employed, of the household head:

- Manual
- Non-manual

- Retired
- Unemployed
- Others (students, housewives or invalid persons as households' heads).

This scheme slightly deviates from the one developed and used in the context of the previous DAFNE III project (manual; non-manual; retired; and, other). The DAFNE participants noted that the last composite category presented several problems, as it comprises individuals with different activity levels and varying incomes. Hence, participants decided on a disaggregation, by separating the vulnerable group of unemployed household heads. Analyses were then replicated, using this amended classification scheme, in the datasets of all the DAFNE countries and the results have been incorporated in the database of the new *DafneSoft*.

Since all the remaining households were classified in the last heterogeneous group, participants decided to label this group as *Others*. If the *Others* category corresponds to more than 5% of the total survey sample, details will be sought with respect to the type of households classified under this category.

- Household composition

Though not frequently considered in dietary analyses, household composition can have an influence on dietary choices and practices. With children defined as being up to 18 years old, adults being between 19 and 65 years of age and individuals more than 65 years old considered as elderly, and with an intended distinction between single and other households, eight categories were formed:

- single adult households,
- households of two adult residents,
- households of one adult resident and children (lone parent),
- households of two adult residents and children,
- households of adult and elderly residents,
- households of children, adult and elderly residents,
- single elderly households and
- households of two elderly residents.

Because of the small number of households classified in some of the above groups, participants decided that data on the daily food availability will be reported only if:

- The group corresponds to at least 0.5% of the total survey sample

AND

- More than 100 households are classified under this group.

Lastly, one group will be added including all households that are left unclassified and will be labeled as *Others*.

All classification schemes for the socio-demographic variables under study and separately for each country and survey year are included in Annex III.

Identification of the household head

The DAFNE classifications of the households' socio-economic characteristics (as described by educational attainment and occupational status) are based on information provided for the "household head". The sampling scheme used in the Swedish HBSs did not allow for uniquely identifying this person. However, a contemporary second survey was undertaken in 1989 (though not the same weeks), in which the same households provided information on a set of socio-economic variables. The collected information was integrated in the core HBS dataset. In agreement with the Swedish Statistical Office, it was decided to identify as "household head" the member of the household with the "highest" socio-economic code in 1989. In the case of the 1996/97 data, as "household head" was defined the member of highest age.

Estimation of the average daily food availability for the overall population and for socio-demographic groups.

Analyses were conducted separately for each of the participating countries. Food availability per person per day was calculated by dividing the household availability by the product of the referent time period and the mean household size. Individual availability was estimated without making allowances for inedible parts, preparation losses, or spoilage on the plate, and under the assumption of equal distribution of food within the household and during the survey period. After indication and advice provided by the national data supplier, a weighting factor was incorporated in the formula whenever necessary to accommodate for the sampling scheme.

Integrating the DAFNE data into nutrition-related information systems

Upon completion of tasks 1-5, the derived database was incorporated into the operating DAFNE databank, which was updated to include harmonised information on the mean daily food availability in 15 EU Member States and Norway (Task 6). The DAFNE databank was further integrated into the operating *DafneSoft* application tool (freely available at www.nut.uoa.gr). The updated *DafneSoft* was presented in the last plenary meeting (Friesing, December 2004). Because of difficulties encountered in downloading *DafneSoft* as a desktop application, participants agreed to convert it to a web-based application. Amendments were also suggested and discussed, in order to improve the potential of *DafneSoft* as a nutrition monitoring tool. The coordinating centre undertook the responsibility of developing the new *DafneSoft*, which will again be accessible through the website of the Coordinating Centre (www.nut.uoa.gr).

Estimating the daily nutrient availability, using national HBS data

Tasks 7 and 8 aimed at developing methodologies for estimating the mean daily nutrient availability, using data from national HBS. The methodologies were validated in Greek and German datasets and the finally accepted one was applied in the Greek HBSs of 1981/82, 1987/88, and 1998/99.

Method of estimation

The conversion of household food acquisitions into nutrient availability is not a straightforward one, since HBS mostly provide data on the level of food groups, rather than on individual food items. Thus, food composition data need to be adjusted. The adjustment approach, as well as preliminary results were presented by the coordinating centre during the second plenary meeting (Rome, September 2003). In the course of the discussion, the German participant expressed an interest in joining this activity. A bilateral working meeting took place at the Athens coordinating centre (April 2004) and the following common methodological approach was decided:

The most frequently used, by these two countries, food composition tables (Germany: *Bundeslebensmittelschlüssel, BLS, version II.3* (14) and Greece: Composition tables of foods and Greek dishes (15); Tables on the composition of Greek fish and cheeses

compiled by the University of Thessaloniki and Crete respectively (16, 17) and the McCance and Widdowson food composition tables and supplements (18) were the basis for the development of adjusted food composition tables that were applied in the present analysis. Adjustments were made to address the specific requirements of the HBS food data and to meet the constraints posed by the characteristics of the HBS food data. In particular, according to the HBS methodology the food items which the households acquire are grouped into pre-defined food codes, which are often of an aggregated nature. In some cases, the food items classified under one code are described in detail. In other cases, however, the food items grouped are not described and generic names are used for the corresponding food code (e.g. food code described as *soft cheese* with no specific details on which particular cheese the households consumed).

Four different approaches were decided to address the aforementioned problems and were developed in an attempt to cover various situations, in terms of data availability at the country level. All approaches estimate the nutrient content of the HBS food codes, but they vary in the degree of effort their application requires, with M1 being the least and M3 the most demanding.

Approach M1: Determination through **one food item, representative for the group**.

The nutrient content of aggregated or generic food codes was defined through the nutrient content of the representative food item, which was arbitrarily selected by a group of nutrition experts. The approach is based on the assumption that all food items classified under one food code are compositionally similar and that the selected one is the typical, preferably the most consumed by the respective population.

Approach M2: Determination through **all food items classified under the group (unweighted mean)**.

The nutrient content of the aggregated or generic food codes was calculated as an unweighted mean of the contents of all food items grouped in the food code. Through this approach, the eating habits and preferences of a population are downgraded and in every food code exotic food items are treated in the same manner as popular ones.

Approach M3: Determination through **all food items classified under the group (weighted mean)**.

The nutrient content of the aggregated or generic food codes was calculated as a weighted mean of the contents of food items expected of being consumed by the participants and grouped under this code. Weighting factors were used to allow for the eating habits and preferences of the population under investigation and were determined in two different ways:

Approach M3A: Arbitrary determination of weighting factors, by a group of nutrition experts. A group of nutritionists examined the list of food items indicated under each aggregated food code and discussed about the expected contribution of these items in the respective code. In certain cases, other national sources of dietary data were used to assist decisions. For example, in the case of Greece food balance sheet data on the national supply of vegetable oils were also used. In certain cases, market shares were also considered. For example, shares in the bread market were obtained by the Greek federation of bread makers.

Approach M3B: Systematic determination of weighting factors by referring to external data collected in national individual dietary surveys. Data collected through national individual dietary surveys undertaken during the same period, were used to calculate the mean contribution of every food item grouped under an aggregated or generic code. In particular, data collected through 24-hour recalls in Greece (19) and data collected in the German Ergebnisse der Nationalen Verzehrsstudie (NVS) study were used.

The application of the approaches described above generated two sets of four food composition tables, which were used for the analysis of the German 1998 and the Greek 1998-99 data. For the analysis of the Greek data, a software interface programme written in Microsoft Visual FoxPro was developed at the coordinating centre. The programme combines three data files: one with information on daily food availability retrieved from the DAFNE databank, one describing the matching of the HBS codes to those of the food composition tables; and one describing the percentage contribution of food items grouped under aggregated food codes.

Validation of nutrient estimations

The results obtained from the analysis of the German and the Greek datasets were validated through comparisons with published nutrient intake data, collected in individual nutrition surveys undertaken in the two countries. For the validation of the German estimates, data of the Bavarian Food Consumption Survey (Bayerische Verzehrsstudie, BVS II) were used (20). The survey was carried out in 2002/03 and assessed the food intake of approximately 900 participants, aged 14 years or older. The dietary information was collected through computer aided telephone interviews to obtain three repeated 24 hour recalls per participant, using the *EPICsoft* programme (21).

In the case of the Greek data, the calculated daily nutrient availability was compared with intakes estimated from data collected through the Greek segment of the EPIC study (22). The study sample consisted of 28572 adult and elderly volunteers, recruited during a five-year period (1994 to 1999) from around Greece. Their usual dietary intake over the past year was assessed through a validated, semi-quantitative, interviewer-administered food frequency questionnaire, which included approximately 150 food items and beverages, as well as questions on habitual cooking methods and type of lipids used in cooking. Standard portion sizes were used for the estimation of consumed quantities (23).

To increase the comparability of the HBS-derived nutrient data with those collected through the individual nutrition surveys in the two countries, sub-samples of the German and Greek HBSs were used. More specifically, the German HBS sample used in the validation exercise consisted of individuals older than 13 years and residents of the Southern German state of Bavaria. In correspondence to the characteristics of the Greek EPIC population, the Greek HBS sample consisted of households with members of 18 years of age and over.

The results of the validation were presented and commented upon in two plenary meetings of the DAFNE IV project (Rome, September 2003 and Vienna May 2004). Apart from the DAFNE IV participants, the Rome meeting was also attended by

Officials from FAO and the British Department for Environment, Food and Rural Affairs (DEFRA), which have long experience in nutrient estimations using this type of data. Results and related discussions are described in the minutes of the respective meetings (Annex VIII of the present report).

In summary, participants concluded that approaches M1 and M2 may provide invalid estimates and should thus not be applied. Common practice should therefore use the M3 approaches, with M3B (systematic determination of weighting factors by referring to external data collected in national individual dietary surveys) being the preferred method and M3A (arbitrary determination of weighting factors, by a group of nutrition experts) being used when corresponding data from national individual dietary surveys are not available.

To timely compare the mean daily nutrient availability in Greece, the M3A approach was applied in the 1981/82, 1987/88 and in the 1998/99 datasets. The selection of the M3A approach was deemed necessary, since no national individual dietary survey was carried out in Greece in the 1980s.

Compiling a protocol for collecting information on meals taken out of home, in the context of the HBSs

Task 9 of the project's Technical Annex was referring to tackling the issue of lacking information on eating out in the national HBSs. To initiate procedures, the coordinating centre invited a representative from the British DEFRA to inform participants on the British experience (second plenary meeting, Rome September 2003). Data on meals taken out of home have been collected in the UK HBS data since 1994 and the recording system has recently been faced amendments in the context of the new Expenditure and Food Survey. The DEFRA representative provided background information, described the applied methodology and commented on the preliminary results of the new survey, in relation to eating out. Summaries of his presentations are included as Annexes to the minutes of the Rome meeting (Annex VIII of the present report). Participants were further informed on how this type of data was once collected in Germany (the EVA study on nutritional behavior away from home, undertaken in 1998), as well as on the obtained results. Based on these presentations, participants developed an inventory in order to elucidate the type of information on eating out currently collected in the HBSs of the participating countries. In March 2004, the coordinating centre disseminated the final version of this inventory and participants' replies were presented in the third plenary meeting (Vienna, May 2004). A document summarizing the replies received by the participating countries is included as Annex IV.

After evaluating the situation in relation to the currently collected data on eating out, participants decided on suggestions on how to improve the quality and the interpretability of the collected data. Based on these preliminary suggestions, the coordinating centre drafted a protocol for collecting data on eating out through the HBS. The protocol was sent to participants for commenting and was finalized in the last plenary meeting (Friesing Germany, December 2004). In summary, participants agreed on the following:

- There is a need for a clear and common definition, which will be adopted by the Offices responsible for data collection. The definition, accompanied by examples, should be explicitly described to both interviewers and participants.

- All households participating in the HBS should, preferably, be asked to collect information on food quantities consumed outside the household premises and not coming from the household supplies. If, however, there is concern about a reduction in the HBS response rate, a sub-sample could alternatively be used. To assure national representativeness and feasibility of generalizing the results, the sub-sample should be selected on the basis of the same criteria used for the main HBS sample.
- If open diaries are used in the main survey, then open diaries can also be used for recording the out-of-home food consumption. If not, closed questionnaires can be the option.
- Questionnaires should collect information on the following: Place of consumption; Type of meal (breakfast; snack; lunch; dinner; beverage); Description of foods and/or beverages consumed; Cost; Quantities consumed
- The use of till receipts in validating the recorded information can also be considered, but with due attention in differentiating the food consumed by the respondent versus the food paid by the respondent.
- Interviewers may also need to probe for precise details, such as whether a food was “low fat” or whether a soft drink had added sugar.

The final protocol is included as Annex V

C. Results

Monitoring the mean daily food availability in European countries

Tables presenting the mean availability of the 15 DAFNE food groups by country and year of survey are included as Annex VI. Mean availability values by the four socio-demographic characteristics under study are also presented for each country and survey year. Graphical presentations of time changes and between countries differences in the daily individual food availability are included in a glossy publication entitled *Network for the Pan-European Food Databank based on Household Budget Surveys – The DAFNE IV project*. In this publication, disparities on the mean daily availability of food groups with public health interest (vegetables; fruits; meat and meat products; milk and milk products; wine and beer) are presented for all countries of the DAFNE database. The publication will be available in a print-out format at the coordinating Centre's website (www.nut.uoa.gr).

Changes of food availability over time and the effect of socio-economic characteristics on food choices are below summarised for each of the 15 main DAFNE food groups. Because of changes in Germany in early 1990s, time comparisons of food availability in this country were solely based on data collected in 1993 and in 1998.

Households run by unemployed individuals generally recorded higher food availability values for all food groups, denoting possibly higher, if not exclusive, food consumption within the household premises. Employed individuals on the other hand commonly have meals out of home, resulting probably to a lower acquisition of food for household consumption.

Eggs: The mean daily availability of eggs decreased with time. Urban households, with heads of higher education or employed in non-manual professions generally recorded lower mean availability values in all survey years. The only exception stands for the Portuguese households, among which, urban, non-manual households, or those of upper education recorded higher mean daily availability of eggs.

Potatoes and other starchy roots: The highest potato availability was recorded in Portugal (180 g/p/d in 2000) and Germany (115 g/p/d in 1998) and the lowest in Sweden (85 g/p/d in 1996). Over time, the daily availability of potatoes and other starchy roots decreased in all countries. With respect to the effect of education, potato availability decreased as the educational level of the household head improved. Higher values were also recorded among manual households, as compared to non-manual ones, and among rural households, when compared to urban ones.

Pulses: Pulses, plant foods of high fibre and protein content, can be considered as a food preferably consumed in South Europe, since in Portugal, Greece and Spain (7) the mean pulses availability exceeded 9g/p/d, while in Central and North Europe the availability values barely exceeded 2g/p/d. Time trends were however not consistent, as in Portugal and Germany the mean daily availability of pulses decreased with time, whereas in Finland and Sweden it increased. In Portugal, where the consumption of pulses is related to traditional dietary choices, rural households or those with heads of low educational level recorded substantially higher values in all survey years. Interestingly, similar socio-demographic trends were also recorded in Finland, whereas in Germany and Sweden no consistent pattern can be observed.

Nuts: In the 1990s, the mean daily availability of nuts generally increased. In summary, nuts seem to be preferably consumed by individuals of higher education or non-manual professions, or individuals residing in urban areas and these observations seem to persist over time. An exception should however be noted in Portugal, where in late 1980s and early 1990s nuts were preferred more by rural households as compared to the urban ones. The pattern, however, reversed in 2000.

Cereals and cereal products: The mean availability of cereals and their products (including bread, rusks, pizza, and bakery products) increased in the studied countries, but Portugal. In terms of patterns of cereal intake, Austria leads with 303g/p/d (1999-2000) and Sweden trails with 200g/p/d (1996). In Portugal and the two Nordic countries (Finland and Sweden), individuals of elementary education or

manual professions or residing in rural areas recorded the higher values of cereal availability within their households. In Austria and Germany different patterns were observed, as in both countries the higher values were recorded by urban households and no difference was observed between the manual and the non-manual occupational groups.

Milk and milk products: Different patterns were observed with respect to the daily individual availability of milk and milk products. In late nineties, the highest availability values were recorded in Finland (507 g/p/d) and Sweden (445 g/p/d) and the lowest in Portugal (276 g/p/d). In the 1990s, the daily availability of milk, cheese and other milk products increased marginally in Portugal, remained steady in Sweden and decreased in Finland and in Germany. In Portugal, the daily availability of milk and milk products presented a socio-economic gradient, since households of urban areas, or of higher education or those whose heads were employed in non-manual professions recorded the higher values. This finding may reflect the preferable consumption of milk products and cheese in particular, by individuals of higher socio-economic status (24). In Finland and Sweden, on the other hand, substantially higher daily availability of milk and milk products was recorded among rural households, among households of elementary education or with heads of manual profession. In Austria and Germany, the consumption pattern lied somewhere in between.

Meat and meat products: Based on data collected in the 1990s, the lowest meat and meat product availability was recorded in Sweden (127 g/p/d) and the highest in Austria (182 g/p/d). With respect to time trends, meat availability either increased (Finland and Sweden) or remained steady (Germany and Portugal) in the studied time period. In all countries but Portugal, residents of urban areas, or of high educational level, or of non-manual professions reported purchasing smaller amounts of meat and meat products for household consumption. In Portugal, no differentiation was generally observed, although non-manual households recorded a slight reduction in meat availability in the second half of the 1990s, which was not evident among the manual ones.

Vegetables (fresh and processed): Interestingly enough, according to HBS data collected in late 1990s, Germany recorded the highest vegetable availability within the household (180 g/p/d) and Finland the lowest (123 g/p/d). Given current recommendations for at least 3 portions of vegetables (approx. 250 g/p/d) on a daily basis, Europeans are still remote from meeting this target. If we further consider that the above values refer to vegetable purchases, which are generally higher to actual intake, the deficit is more pronounced. In recent years however, vegetable availability is clearly on the rise in Northern and Central Europe. In southern Europe, the mean daily vegetable availability within the household did not exhibit a similar increase, considering of course that it began at a much higher baseline. In all countries, but Portugal, high vegetable consumers reside in urban areas, or exercise non-manual professions. The educational level did not affect the vegetable availability in a consistent manner, as in Germany and Finland highly educated households reported consuming more vegetables, whereas in Austria and Sweden no differentiation was observed. In Portugal, the mean daily vegetable availability did not seem to be differentiated by socio-demographic characteristics.

Fish and seafood: The highest daily fish availability was recorded in Portugal (83g/p/d) and the lowest in the two Central European countries: 16g/p/d in Germany and 9.3g/p/d in Austria. In the two Nordic countries, Sweden and Finland, fish availability was 30g/p/d. No large variations have been observed in fish availability over time, with the exception of Portugal, where daily availability values increased (+9g/p/d) from late 1980s to late 1990s. In all countries, but Finland, urban areas recorded higher fish consumption. In general, fish availability was higher among households of non-manual professions, while it was not found to differ between levels of education attainment. The only exception were Austria, where fish availability although low among all population groups, increased as one moved from rural to urban areas, or as the educational level of the household head improved.

Fruits (fresh and processed): Fruits, together with vegetables, are the two food groups most frequently mentioned for their beneficial attributes. Among the countries under study, the highest mean daily fruit availability within the household was

recorded in Portugal (198 g/p/d) and the lowest in Sweden (122 g/p/d). Although the daily availability did not substantially change in recent years, fruits are another example of narrowing the gap between North and South European dietary choices, particularly when fruit juices are also included in the groupings. The highest fruit consumers were generally found in urban areas, were of college or university education, or were employed in non-manual professions. A less consistent pattern was observed with respect to the locality of the residence and the educational level of the household head in Austria, Finland and Sweden. This observation might, however, reflect the lack of information on eating out which may differentially affect different socio-demographic groups.

Total added lipids: The added lipid group includes all added fats (e.g. butter, margarine) and oils (olive oil and seed oils). The highest lipid availability was noted in Portugal (51g/p/d) and the lowest in Finland (31g/p/d). In all countries, lipid availability has either remained steady or decreased, with the most marked decrease being noted in Portugal (-12g/p/d). Although the type of lipid consumed is different in the various European regions, in all cases and through different survey years, lipid availability was higher in rural areas and among households of elementary education, possibly indicating that high lipid availability may be related to traditional eating patterns. The daily availability of added lipids was also higher among manual households, in comparison to non-manual ones, indicating probably a preference towards a more energy dense diet.

Alcoholic beverages: The lack of information on meals and beverages consumed outside the household is expected to impair observations related to the alcoholic beverage intake. It should thus be considered, when interpreting HBS data, that values on alcohol intake are only related to household availability. In addition, some concern has been expressed by the Swedish participants on the magnitude of underreporting in the past 10-15 years (25). For this reason, data on alcoholic beverages are not presented for Sweden. Taking note of the above, the highest availability values were recorded in Germany (200 ml/p/d) and the lowest in Finland (102 ml/p/d). In terms of time trends, the availability of alcoholic drinks within the household has increased in

Finland, while it decreased in Portugal and slightly in Germany. In Finland and in Germany, alcoholic drinks have generally been more available in urban households or households with heads of higher education; while in Austria and in Portugal the opposite pattern was recorded.

Non-alcoholic beverages: In accordance to alcoholic beverages, due caution is required when interpreting data on the daily availability of non-alcoholic beverages (including soft drinks, mineral water, coffee and tea) at household level. With the exception of Germany, the availability of non-alcoholic beverages has increased in recent years in the countries under study. Germany is leading the availability (915ml/p/d) and Portugal trails with 171ml/p/d. With respect to locality, in Austria and Germany non-alcoholic beverage availability generally increased in urban households, whereas the opposite trend was observed in the two Nordic countries under study. Between countries and survey years, no consistent pattern of the association of education or occupation to non-alcoholic beverage availability was observed. Portugal is, however, a case worth mentioning since in this country the mean daily availability of non-alcoholic beverages clearly followed a socio-economic gradient, with urban or highly educated households or those with non-manual heads recording the higher values.

Sugar and sugar products: The higher daily availability of sugar and sugar products was recorded in Austria (74g/p/d) and the lower in Portugal (30g/p/d). In spite of current nutritional trends, only in Portugal did the daily availability decrease. In the other participating countries, it either remained unchanged (Germany) or slightly increased (Finland and Sweden). In all cases, sugar and sugar product availability was higher among rural households, of elementary education, or manual professions. Over time, the pattern described above generally remained unchanged.

Juices (fruit and vegetable): In the 1990s, the availability of fruit and vegetable juices increased in all the countries under study. However, the range of availability values is substantially large and varies between 11ml/p/d in Portugal to 123ml/p/d in Germany. In terms of socio-economic disparities, in all countries and survey years,

juices were preferably consumed by highly educated individuals, or individuals exercising non-manual professions.

Results on the mean food availability (g-mL/person/day) in all countries of the DAFNE network are currently available to any interested user through *DafneSoft v 3.0* (www.nut.uoa.gr). The *DafneSoft* is a web-based application tool, which allows:

- (a) presenting the DAFNE data in various formats (tables, bars, pie charts, map presentations) and at various levels of detail (from the analytical national food codes to the common DAFNE food groups)
- (b) monitoring trends in food availability over time, both within and between the 16 countries of the network
- (c) studying the effect of the household's locality and composition, as well as of the education and occupation of the household head on the daily food choices and
- (d) exporting the data for further uses.

Mean daily nutrient availability. Estimates derived using national HBS data from Greece and Germany.

Validation of nutrient estimations

The validation of the nutrient estimates were based on:

1. Comparisons of the daily intake of energy and selected nutrients (protein; carbohydrate; fat; saturated, monounsaturated and polyunsaturated fatty acids; sodium; potassium; calcium; vitamin C) calculated using the HBS data with those estimated through specially designed individual surveys
2. Comparisons of the values on the nutrient composition of selected HBS food codes, as these were estimated with the application of the M1, M2, M3A and M3B approaches. In the case of Germany, comparisons focused on the following food codes: Rice; Non-white Bread (Graham bread, Gray bread); Pork; Fish; Cheese (except cottage cheese); Berries (e.g. Raspberry, Currant); and Potato products. In Greece, the following food codes were used: Pasta; Bread; Poultry; Fish; Cheese; Peaches/Apricots; and Potato products.

The results of these exercises (Annexes VIIa and VIIb) were presented and discussed

in the third plenary meeting of the project. Participants concluded that approach M3B (systematic determination of weighting factors by referring to external data collected in national individual dietary surveys) yielded valid estimates in the majority of the cases. Nevertheless, in cases where data from specially designed individual surveys are not available, approach M3A (arbitrary determination of weighting factors, by a group of nutrition experts) would be the second choice.

Participants further acknowledged the necessity for a common food composition table to be used in a harmonized procedure for estimating nutrient availability from HBS data. Concerns were, however, expressed either in the use of the same composition data for all the countries or in the magnitude of errors that will be introduced if different national tables are used. Participants also concluded that the network should aim to a DAFNE Food Composition Table and noted that the outcome of running projects related to food composition data for international comparisons (e.g. the EUROfir Network of Excellence) will prove useful in the DAFNE nutrient estimations.

Following the above concluding remarks, the M3A approach was applied in the Greek HBS datasets of 1981/82, 1987/88 and 1998/99. Approach M3A was selected, as no individual dietary survey was undertaken in Greece in the 1980s. Results on the mean daily availability of the selected nutrients are summarized in **Table 2**. The daily availability of kilocalories is within the range of values reported for the Greek population (from 1819 kcals reported by females 55-64 years old to 2704 kcals reported by males 25-34 years of age) (26). One would expect the HBS-based energy estimates to be higher to those derived from individual dietary surveys. It should, however, be noted, that the HBS data refer to all possible ages, including children and elderly who have lower energy intakes when compared to adults and food data were estimated without considering the gender and the age of the household members. In addition, information on the food eaten at restaurants, canteens and similar establishments is missing from the HBS data.

According to **Table 2**, the daily availability of energy and nutrients in a nationally representative sample of Greek households is adequate. Fat contributed to more than

40% of the daily energy, with monounsaturated fatty acids being the important contributor (22% of the energy intake). The intake of saturated fatty acids has substantially increased since the 1960s, when the first data on the diet of the Mediterraneans were collected, and it is very close to the upper recommended level of 10% of total energy intake (27). The relative share of protein to total energy availability is again within the optional range (27). The daily availability of sodium was also within the indicated range of 600-3500 mg/day; the availabilities of potassium and calcium were above the recommendations of 3100 and 700 mg/day, respectively (27). In terms of time changes, the daily availability of energy and all nutrients under study decreased in the 1990s. In terms of nutrient shares to total energy availability, however, the share of protein, total fat and monounsaturated fatty acids in particular increased, whereas the share of carbohydrates decreased.

Table 3 presents the order of priority by which ten food groups contribute to the daily intake of energy and macronutrients. Results are presented for three surveys undertaken in the 1980s and the 1990s. In all survey years, cereals and cereal products, olive oil, meat and meat products were the main energy contributors. Meat, cereals, cheese and fish were important protein sources. Cereals, potatoes and fruits contributed more than 70% of the daily carbohydrate availability. As expected, olive oil was identified as the main source of lipids, followed by meat and cheese. The share of olive oil in the daily lipid availability substantially decreased in late 1980s. Part of the decrease was compensated by an increase in the contribution of other vegetable oils (data not shown). The share of olive oil in the daily lipid availability increased in late 1990s, without reaching, however, the levels of early 1980s. An increase in the share of the daily lipid availability was also noted in the case of cheese.

Milk and milk products are important contributors of saturated fatty acids in the Greek diet. With respect to the availability of minerals cereals and their products, cheese, meat and meat products contributed almost 80% of the daily sodium availability. Vegetables and potatoes were important potassium contributors and, as expected milk and cheese were major sources of calcium. Vitamin C mainly derived from the consumption of fruits (43.7%), vegetables (36.2%) and potato (10.8%). The

data on the share of the selected food groups to types of fatty acids, minerals and vitamins will be presented in a publication which is currently under preparation by the Coordinating Centre.

Table 2: Mean daily individual availability (% contribution to total energy) of selected nutrients in Greece during the period 1981-1999.

	1981-82	1987-88	1998-99
Energy (kcal)	2706	3035	2538
Protein (g) (% energy)	84 (12.4)	93 (12.3)	83 (13.0)
Fat (g) (% energy)	124 (41.3)	143 (42.4)	124.9 (44.3)
SFA (g) (% energy)	26.1 (8.7)	31.5 (9.3)	26.2 (9.3)
MUFA (g) (% energy)	67 (22.4)	70 (20.6)	63 (22.2)
PUFA (g) (% energy)	10 (3.4)	17 (5.0)	15 (5.3)
Carbohydrate (g) (% energy)	301 (41.7)	329 (40.6)	252 (37.3)
Sodium (mg)	2091	2643	2147
Potassium (mg)	3300	3544	3462
Calcium (mg)	1097	1242	1080
Vitamin C (mg)	133	144	144

Table 3: Order of priority and % of share (in parenthesis) of each food group in the mean daily availability of energy and macro-nutrients, from 1981 to 1999, in Greece.

Foods	1981-82				1987-88				1998-99			
	Energy	Protein	Fat	Carbo- hydrate s	Energy	Protein	Fat	Carbo- hydrates	Energy	Protein	Fat	Carbo- hydrates
Cereals & products	1 (29.7)	2 (29.4)	5 (3.9)	1 (56.8)	1 (28.3)	2 (29.0)	5 (5.2)	1 (53.6)	1 (26.3)	2 (25.8)	4 (4.7)	1 (54.1)
Meat & products	3 (8.3)	1 (30.5)	2 (10.0)	-	3 (8.9)	1 (31.8)	2 (10.2)	-	3 (8.7)	1 (30.5)	2 (9.7)	-
Fish	10 (1.6)	3 (8.5)	6 (1.0)	-	10 (1.4)	4 (8.1)	6 (0.9)	-	9 (1.9)	3 (10.3)	6 (1.1)	-
Vegetables	8 (2.0)	8 (1.7)	-	6 (2.3)	8 (1.9)	8 (1.9)	-	5 (2.5)	8 (2.5)	8 (2.4)	-	5 (3.7)
Fruits	7 (3.7)	-	-	3 (7.3)	7 (3.6)	-	-	3 (7.3)	7 (3.8)	-	-	3 (8.3)
Milk	4 (5.0)	4 (8.1)	4 (5.6)	5 (2.7)	4 (5.0)	5 (8.1)	4 (5.4)	4 (2.7)	4 (5.3)	5 (8.2)	5 (4.6)	4 (4.1)
Cheese	6 (3.8)	5 (7.4)	3 (6.7)	-	5 (4.5)	3 (9.0)	3 (7.6)	-	5 (5.3)	4 (10.0)	3 (8.6)	-
Olive oil	2 (25.2)	-	1 (60.6)	-	2 (20.9)	-	1 (49.0)	-	2 (23.5)	-	1 (52.6)	-
Potatoes & other starchy roots	5 (4.4)	7 (3.7)	-	2 (8.9)	6 (3.9)	7 (3.3)	-	2 (8.1)	6 (4.2)	7 (3.4)	-	2 (9.4)
Pulses	9 (1.9)	6 (4.6)	-	4 (2.8)	9 (1.5)	6 (3.8)	-	6 (2.3)	10 (1.6)	6 (3.8)	-	6 (2.7)

D. Organisation and activities of the project

The project was coordinated by the Department of Hygiene and Epidemiology, Medical School University of Athens. Four plenary meetings took place in the course of the project and eight bilateral meetings were undertaken between the coordinating center and the participating countries to address country-specific problems. Summaries of the project's plenary meetings and bilateral working sessions are given below.

Plenary Meetings

I. First Plenary Meeting. Vienna Austria, November 15-16 2002.

The project coordinator presented an overview of the project's objectives and details on the project's tasks. Based on a common inventory disseminated prior to the meeting, participants presented the methodological characteristics of the datasets which would be provided to the coordinating centre. The sequence of tasks in order to proceed to the data provision, cleaning, management and storage was described. Methodological issues referring to the DAFNE classification schemes were also discussed.

II. Second plenary meeting. Rome Italy, September 28-30 2003.

The meeting particularly focused upon issues related to data provision, reading, management and analysis. Participants further shared their experiences in applying the classification schemes and amendments were decided. Some preliminary results were presented and commented upon for Austria, Finland and Germany. Discussion followed on the common format of the national reports and on the project's publication strategy. Participants also drafted a proposal for organizing a DAFNE workshop in the 2005 IUNS Conference, which will be held in Durban, South Africa. The second day of the meeting was attended by three invited experts from DEFRA, UK and from the FAO Economic and Social Department, Statistics Division. The experts presented background information and shared their views on how to handle the HBS data for estimating nutrient intakes. In relation to developing the methodology for collecting information on eating out, participants drafted an inventory to evaluate the current situation.

III. Third plenary meeting. Vienna Austria, May 15-17 2004

Participants finalized the food and socio-economic classification schemes for the participating countries and discussed issues related to the conversion of expenses to quantities, particularly in the Austrian dataset. During the meeting, the project's publication strategy and plans were discussed and agreed upon. The third meeting primarily focused on discussing the information provided by the participating centers in relation to how information on meals out of home is currently collected in the HBSs and on putting together basic ideas and suggestions on how the quality and the interpretability of these data could be improved. Lastly, the results on nutrient estimations and on the validation of these estimations were presented and commented upon.

IV. *Final plenary meeting. Friesing Germany, December 4th 2004*

The last plenary meeting of the DAFNE IV project was also attended by representatives from 5 new EU Member States (Cyprus, Latvia, Malta, Slovak Republic and Slovenia), who will participate in the next phase of the DAFNE project. The project's final results on mean daily food availability were presented. A representative from the coordinating centre also presented the updated DAFNE database, through the DafneSoft application tool. Discussions were also referring to finalizing the protocol for collecting information on eating out and on the concluding remarks in relation to nutrient estimations based on German and Greek HBS data. The German participant presented a manuscript describing the methodology for estimating food consumption away from home, based on expenditure data collected in the HBSs and a representative from the coordinating center presented a manuscript on the identification of dietary patterns and on their socio-demographic determinants among the DAFNE countries.

The minutes of the project's plenary meetings are included as Annex VIII.

Bilateral Meetings

The following eight bilateral meetings took place in the course of the DAFNE III project:

- Meeting between Germany and the Athens coordinating centre (Athens, May 29-31, 2003)
- Meeting between Portugal and the Athens coordinating centre (Porto, July 1-3, 2003)
- Meeting between Sweden and the Athens coordinating centre (Athens, March 18-20, 2004)
- Meeting between Germany and the Athens coordinating centre (Athens, April 3-5, 2004)
- Meeting between Austria and the Athens coordinating centre (Athens, June 1-3, 2004)
- Meeting between Sweden and the Athens coordinating centre (Athens, July 28-29, 2004)
- Meeting between Germany and the Athens coordinating centre (Athens, September 16-28, 2004)
- Meeting between Portugal and the Athens coordinating centre (Athens, December 12-17, 2004).

Bilateral meetings were scheduled in order to deal with country-specific issues related to data reading and integrating, to the application of the classification schemes, to data analysis and, in one occasion (Athens, September 2004), to the development of the methodology for the nutrient estimations and the preparation of a manuscript on the methodology for estimating food consumption away from home, based on expenditure data collected in the HBSs (submitted for publication to the British Journal of Nutrition).

The summary reports of the project's bilateral meetings are included as Annex IX

Activities of the DAFNE IV project

The new updated DAFNE software – The DafneSoft v3.0

Upon completion of the DAFNE IV project, the enlarged databank was integrated in the DafneSoft application tool. Some amendments on the tool's interface, options and facilities were further decided. The new *DafneSoft* will be available by August 1st, as a web-based application, accessible through the Coordinating Centre's website (www.nut.uoa.gr). In addition, the group of *unemployed household heads* was added in the respective classifications and *household composition* was added as a new socio-demographic variable.

Education – Undergraduate, Graduate and PhD studies

- The presentation of the DAFNE project forms an integral part of the programme of the Summer School “EU Basics in Public Health Nutrition”, organised yearly by the Unit for Preventive Nutrition of the Karolinska Institute. The Summer School is included in the curriculum of the EU Masters in Public Health Nutrition.
- In the context of the ERASMUS/SOCRATES programme, staff from the Athens Coordinating Centre visited the University of Kuopio, Finland and the Karolinska Institute, Sweden and presented the DAFNE initiative and the *DafneSoft* application tool to undergraduate and graduate students of nutrition and nutritional epidemiology.
- The DAFNE databank and the *DafneSoft* tool were also presented to undergraduate students of the Department of Food Technology and Biotechnology of the Athens Agricultural University
- Three members of the DAFNE team are undertaking their PhD theses in subjects related to the use of HBS data for nutrition purposes. The titles of their theses are the following:
 - *Food and nutrient availability in Austria, based on household budget survey data.*
Alexandra Suchomel, University of Vienna, Austria
 - *Time series analyses using German household budget survey data.*
Kornelius Wagner, TUM, Munich Germany
 - *Trends in household food and nutrient availability during the last decade (1990 – 2000) in Portugal – socio-demographic and regional disparities in association with mortality patterns.*

Sara Rodrigues, University of Porto, Portugal

Participation in the National Nutrition Policy Committee of the Greek Ministry of Health and Welfare

To assess the dietary habits of the Greek population and formulate actions and measures, the Greek National Nutrition Policy Committee utilized DAFNE data collected in Greece in the 1980s and the 1990s. The assessment included evaluation of the current situation, identification of overtime changes and of socio-demographic characteristics that may shape food choices. The conclusions of the above effort were presented in the Committee's report.

Actions towards the enlargement and sustainability of the DAFNE databank

To ensure the continuity of the DAFNE initiative on exploiting the HBS data and to expand the DAFNE databank, the Athens Coordinating Centre has submitted two proposals, which have both been positively evaluated. The first refers to a Support Action in the context of Specific Measures in Support of International Cooperation (INCO) for Western Balkan Countries (DG-RTD). The title of the project is: *The use of household budget survey data as a tool for nutrition interventions in the post-conflict Western Balkan countries—the European Data Food Networking (DAFNE) approach (Acronym: DAFNE-WBC)*. In this project, the DAFNE network will expand to three West Balkan countries (Albania, Croatia, Serbia and Montenegro). The Regional Office for Europe of the WHO will also contribute in the analysis and interpretation of the monitoring indicators.

On February 8, 2005, the Athens Centre submitted a proposal for a Co-ordination Action entitled: *Eating Out: Habits, Determinants, and Recommendations for Consumers and the European Catering Sector (Acronym: HECTOR)*. The project aims at, among other things, addressing the HBS limitation of lacking data on eating out and has been positively evaluated (score of 28/30). The project will get into the negotiation phase on September 2005.

Lastly, the DAFNE team is contributing in the EFCOVAL project, also submitted on February 8, 2005 (*Full title: European Food Consumption Validation. Acronym: EFCOVAL*). The DAFNE contribution refers to evaluating an approach for collecting harmonized dietary data at the European level, combining the EFCOVAL method (24-hour recall) with the standardized HBSs.

Dissemination of research results

Contribution to the European Nutrition and Health Report

The DAFNE team contributed with a chapter entitled “Food availability in Europe. Data retrieved from the DAFNE databank” to the European Nutrition and Health Report. The compilation of the report was coordinated by the Institute of Nutrition of the University of Vienna (26)

Compilation of a DAFNE pamphlet and of the third issue of the DAFNE glossy publications

The DAFNE coordinating team designed and developed a pamphlet presenting background information on the project, a selection of titles of DAFNE publications, as well as details for the contact points in all countries of the network. The pamphlet will be widely disseminated in meetings, symposia and conferences. Furthermore, the coordinating team compiled the third issue of the DAFNE glossy publications. All issues are available at www.nut.uoa.gr for direct downloading.

Compilation of a publication entitled “THE DAFNE FOOD CLASSIFICATION SYSTEM: Operationalisation in 16 European countries”

This publication aims at presenting the application of the DAFNE food classification system in the 16 countries of the network: Austria, Belgium, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Norway, Poland, Portugal, Spain, Sweden and the UK. The DAFNE classification scheme is presented in the forms of tables, specific for each country and survey year, and can serve as a basis for the integration of foods in a platform, which can contribute in making the European food data interoperable, allowing international comparisons.

DAFNE workshop in Durban

A workshop presenting the DAFNE project and results, as well as the DafneSoft application tool is organised to be held on September 19, 2005 in the context of the 18th International Nutrition Congress (ICC Durban, South Africa, 19 - 23 September 2005). The workshop’s

programme is the following:

Workshop: DAFNE Initiative

Monitoring food availability in developed and developing countries

Time:	09:00 – 13:00
Venue:	Leopard B
Organiser:	DAFNE Initiative

- Data Food Networking: an initiative based on Household Budget Surveys, why and how
Antonia Trichopoulou, Dept of Hygiene and Epidemiology, University of Athens, Greece
- The use of DAFNE data in nutrition monitoring. Views on the basis of the European Nutrition and Health Report
Ibrahim Elmadfa, Institute of Nutritional Sciences, University of Vienna, Austria
- The Bolivian DAFNE Experience.
Armando Perez Cueto Eulert, Nutrition Unit Prince Leopold Institute of Tropical Medicine
- Presentation of the DAFNE databank through the DafneSoft programme
Sara Rodrigues, Faculty of Food and Nutrition Sciences, University of Porto, Portugal
- Estimating missing information on quantities of food available in households based on related expenditure data: The cases of at-home and away-from-home consumption.
Kurt Gedrich, Consumer Economics, Technische Universität München Munich, Germany

Presentation of DAFNE activities in a meeting of the EuroFir Network of Excellence.

The DAFNE activities towards the development of a DAFNE Food Composition Table were presented in a working session of the European Food Information Resource Network (EuroFIR), which aims at developing and integrating a comprehensive, coherent and validated

databank providing a single, authoritative source of food composition data in Europe.

Scientific papers

- Trichopoulou A, Naska A, and the DAFNE III Group. “*European food availability databank based on household budget surveys-the Data Food Networking initiative*” Eur J Public Health 2003;13(3 Suppl):24-28
- Trichopoulou A, Naska A, Oikonomou E. “*The DAFNE databank: the past and the future of monitoring the dietary habits of Europeans*” J Public Health 2005;13:69-73.
- Naska A, Fouskakis D, Oikonomou E, Almeida MDV, Berg MA, Gedrich K, Moreiras O, Nelson M, Trygg K, Turrini A, Remaut AM, Volatier JL, Trichopoulou A and DAFNE participants. “*Dietary patterns and their socio-demographic determinants in ten European countries. Data from the DAFNE databank*” (European Journal of Clinical Nutrition, in press).
- Gedrich K, Naska A, Wagner K, Trichopoulou A, Karg G “*Food Consumption Away-From-Home: An Estimation Based on German Household Budget Survey Data*” (submitted for publication to the British Journal of Nutrition)
- A Pérez-Cueto, A. Naska, J. Monterrey, A-M Remaut, M. Almanza, A. Trichopoulou, P. Kolsteren “*Monitoring food and nutrient availability in a nationally representative sample of Bolivian Households*” (submitted to the Public Health Nutrition Journal).
- A. Trichopoulou, G. Golfis, M. Kammenou, A. Naska. Traditional diet and Globalisation: Nutritional priorities in Greece. Iatriki 2005;87 (3):228-33 (in Greek).
- Methodological approach for monitoring the daily nutrient availability, using the DAFNE databank (under preparation)

Conference Presentations

Oral Presentations

- Naska A, Ekonomou E, Tsiotas K, Antoniou A, Trichopoulou A. *Socio-economic determinants of household food availability in Europe*. International Conference on “Poverty Food & Health in Welfare, current issues, future perspectives. Lisbon, July 2003. Abstract book p 49.
- Trichopoulou A. *Food consumption patterns in Europe*. Abstracts of the 9th European Nutrition Conference, Rome October 2003. Ann Nutr Metab 2003;47:354.

- Naska A. *Dietary patterns in Europe and their trends during the last 20 years*. 3rd Nordic Conference in Epidemiology. Kuopio, Finland, June 2004. Abstract book p.35.
- Naska A, Oikonomou E, Kritselis E, Foukas V, Tsiotas K, Trichopoulou A. *Identification of Dietary Patterns in Four Mediterranean EU Members States and Monitoring Changes Over Time*. International Conference on “Traditional Mediterranean Diet Past, Present and Future Focusing on Olive Oil and Traditional Food Products. National Hellenic Research Foundation, Athens, 20-22 April 2005. Abstract book p. 13.

Poster presentations

- Oikonomou E, Naska A, Tsiotas K, Trichopoulou A. *Monitoring food habits in the Mediterranean region through the DAFNE Databank*. International Conference on “Health benefits of Mediterranean diet. Highlights on Cancer and Cardiovascular Diseases”. Preventive Medicine and Nutrition Clinic, University of Crete, School of Medicine. Aghia Pelagia, Crete, June 2003. Proceedings EGEEA (first edition) p 92
- Perez-Cueto Eulert A, Naska A, Kolsteren P, Trichopoulou A. *Evaluation of the reliability of estimating food quantities from the Household’s food expenses: case study using data from Bolivia*. Abstracts of the 9th European Nutrition Conference, Rome October 2003. Ann Nutr Metab 2003;47:454
- Ekonomou E, Naska A, Tsiotas K, Chloptsios Y, Foukas B, Trichopoulou A for the DAFNE team. *Monitoring changes in food availability in Europe through the DAFNE Databank*. Abstracts of the 9th European Nutrition Conference, Rome October 2003. Ann Nutr Metab 2003;47:633
- Perez-Cueto Eulert A, Remaut de Winter A.M, Ekonomou E, Kolsteren P, Naska A. *Gender and educational level as predictors of changes towards healthy eating patterns in Belgian single households*. Abstracts of the 9th European Nutrition Conference, Rome October 2003. Ann Nutr Metab 2003;47:535
- Oikonomou E, Naska A, Tsiotas K, Foukas B, Chloptsios J and Trichopoulou A. *Overtime trends and socio-economic disparities in the availability of fats and oils in 11 EU Member*

States. Data retrieved from the DAFNE databank. The First Hellenic Conference on contemporary trends in fats and oils. Greek Lipid Forum. National Hellenic Research Foundation, Athens, 9-10 June 2005. Abstract book II-21.

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