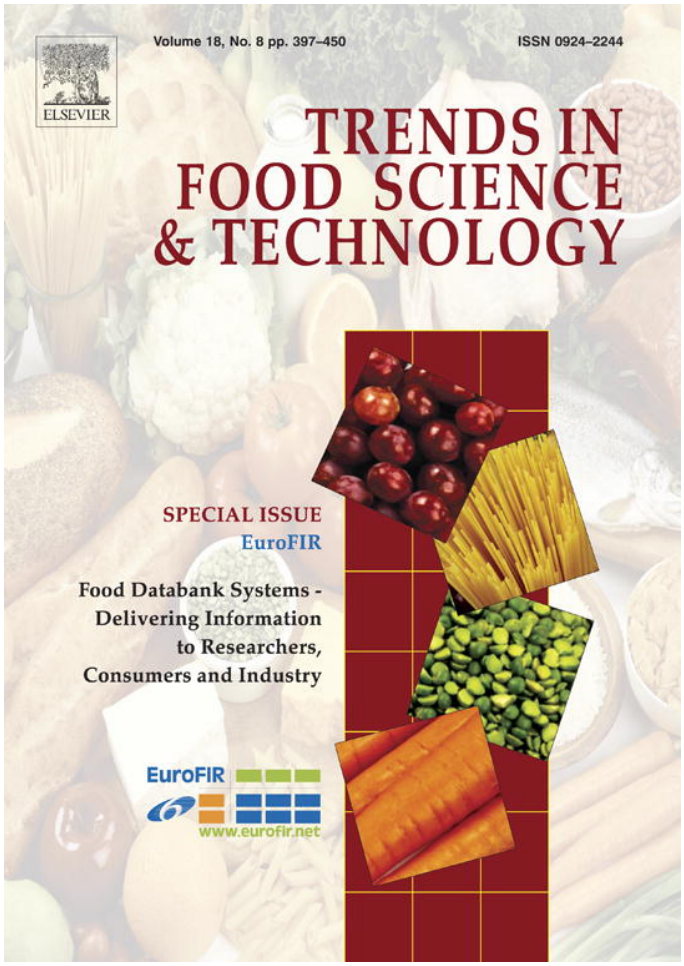

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TRENDS IN FOOD SCIENCE & TECHNOLOGY

Review

Traditional foods: a science and society perspective

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Traditional foods reflect cultural inheritance and have left their imprints on contemporary dietary patterns. They are key elements for the dietary patterns in different countries and consequently are important to accurately estimate population dietary intakes. However, this information is missing from most current national food composition databases. EuroFIR aims to enrich national food composition tables that lack nutrient data on traditional foods and to provide data on selected bioactive components. In this context, a common definition of traditional foods has been agreed upon for the classification of traditional foods in European food composition tables. A list of traditional foods, for which analytical nutritional and bioactive data will be provided, has been developed.

Introduction

Traditional foods are an expression of culture, history and lifestyle. Despite the fact that we are living in a world of globalization, different dietary patterns between countries do exist, as Slimani *et al.* (2002) have reported. The study of traditional foods offers an important insight into dietary patterns and how these have been shaped through time.

Traditional foods and patterns may have potential health properties which, importantly, have been tested over time. For instance, this has been shown for the traditional Mediterranean diet on the basis of observational studies and physiological arguments (Willet, 2006) and even randomized trials (Estruch *et al.*, 2006). For this reason, the current public interest in nutrition and healthy eating has contributed to the increased demand for traditional foods, with a consequent increased interest among food manufacturers. Allende, Tomas-Barberan, and Gil (2006) have shown how the industry has tried to adjust when consumer pressure was developed towards fresh-cut plant products.

Most current national food composition databases are lacking data on country-specific traditional foods as pointed out by Harrison (2004). This information is necessary for national databases in order to accurately estimate population dietary intakes as well as for product labeling. The European Food Information Resource Network (EuroFIR) aims to provide comparable or harmonized data on the nutritional composition of traditional foods across selected European countries by chemically analyzing selected recipes and harmonizing existing compositional data. Comparability will focus on specifying processes and nutrients and harmonization will rely on adherence to agreed upon standards. In addition EuroFIR will determine selected bioactive components for inclusion in the ''Bioactive Substances in Foods Information System'' (EuroFIR BASIS database), thus providing insight on the potential health promoting properties of the recipes (Kris-Etherton *et al.*, 2002).

Dietary patterns in Europe

Nutritional epidemiology sets among its priorities documenting and monitoring dietary habits in the context of planning national food and nutrition policies as well as evaluating nutrition education strategies. Early efforts in documenting dietary habits were focused on identifying specific nutrients that may be responsible for effects on people's health. However, research has also expanded towards studying patterns of food intake (Trichopoulou & Naska, 2002). The reason for shifting research towards dietary patterns stems from the fact that dietary exposures are unusually complex and strongly intercorrelated. Current data suggest that apparent favourable effects cannot be exclusively attributed to specific nutrients since in several instances these nutrients may act synergistically (Gerber *et al.*, 2000).

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[1] On behalf of the participants of the Traditional Foods Work package (see Acknowledgments for full list).

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Publications derived from food consumption surveys focus mainly on presenting dietary intakes in terms of individual foods and/or nutrients consumed. Diet, however, is multidimensional and shaped by various factors, including physiological, agricultural, historical, religious, socioeconomic and psychological ones (Gedrich, 2003).

The analysis of standardized and post-harmonized data collected through the national household budget surveys network (DAta Food Networking-DAFNE database, www.nut.uoa.gr) has demonstrated that dietary patterns differ and change over time in European countries under the influence of various socio-demographic factors (Naska *et al*., 2006) (Figs. 1 and 2). This has been demonstrated in the 16 European countries included in the DAFNE database (Austria, Belgium, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Norway, Poland, Portugal, Spain, Sweden, and United Kingdom).

The study of European dietary patterns has revealed the existence of discrepancies in diet, in the sense that food purchase and consumption at the individual, household, or community level are influenced by the local availability of foods and the cultural and socioeconomic environment. Nevertheless, a trend for assimilation is evident and perhaps unavoidable. In the 1960s the diet of the Mediterranean populations was characterized by high consumption of fruits and vegetables as opposed to the low consumption of these foods in the Northern European populations. These large differences appear to be diminishing as contemporary patterns reveal Mediterranean populations straying from their traditional dietary choices (Karamanos *et al*., 2002), whereas Northern European populations increase the consumption of fruits and vegetables. The reduced contrasts have been documented by, among others, Karamanos *et al*. (2002) and by Trichopoulos and Lagiou (2004).

The contemporary dietary patterns of the Mediterranean populations are characterized by the relatively high consumption of vegetable oils and in particular olive oil (which is the predominant lipid added by inhabitants of Greece), pulses, red meat, poultry, fish and seafood. For the Northern European populations the dietary patterns are characterized by high daily availability of vegetable and animal fats (Fig. 3). Although the disparities in food choices between the Northern and Southern European populations are progressively narrowing, in the case of foods which traditionally characterize the culture of a region, such as olive oil and pulses, a clear North/South gradient is still obvious and is shown in Fig. 3.

The role of traditional foods in dietary patterns

It has been shown that differences in dietary patterns between European populations living in different geographical regions as well as between populations in the same region do exist (Slimani *et al*., 2002), although they are narrowing as reported by Trichopoulos and Lagiou (2004). These differences should be welcomed as they represent an acknowledgment of our traditions. The North/South gradient in European dietary patterns is a reflection of differences of climatic, agricultural and economic conditions in the corresponding populations. In most cases, the variety in dietary habits derives from the fact that inhabitants had to adjust to climatic conditions. In order to be self-sufficient people have developed methods of farming, processing and preserving suitable foods. As time passed and societies evolved, the dietary choices were embodied in the culture and nutritional choices, including traditional foods, became parts of their collective identity as also indicated by Behar (1976).

Key elements of nutritional differences are traditional foods. They are foods that have been consumed regionally or locally for an extensive time period. The consumption of many traditional foods can be traced back to centuries ago. Traditional foods reflect cultural inheritance and have left their imprints on the respective dietary patterns, despite the fact that contemporary lifestyles do not encourage their preservation in our daily lives and customs.

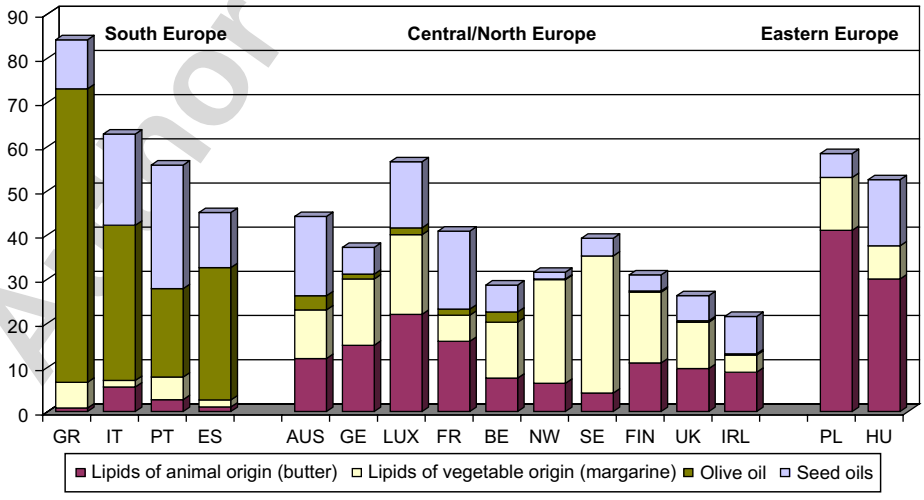

Fig. 1. Mean daily availability of total added lipids by type in the DAFNE countries, g/person/day (data collected in the 1990s). Source: The DAFNE databank (www.nut.uoa.gr/dafnesoft).

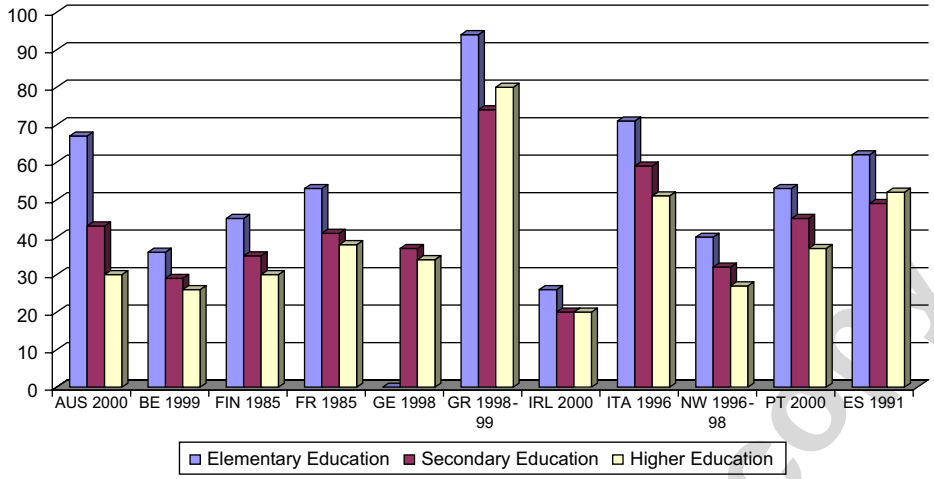

Fig. 2. Mean availability of added lipids by educational level of the household head (g/person/day). Source: The DAFNE databank (www.nut.uoa.gr/dafnesoft).

Traditional foods, apart from being vehicles of our culture, may also possess health qualities, since tradition rarely honours foods which are not palatable and healthy. An example of a dietary pattern with positive health aspects attributed to it is the traditional Mediterranean diet as also argued by Willet (2006). The traditional Mediterranean diet is characterized by nine components: a high intake of vegetables; a high intake of pulses; a high intake of fruits; a high intake of nuts and cereals (that in the past were largely unrefined); a high intake of olive oil, and a low intake of saturated lipids; a moderately high intake of fish; a low to moderate intake of dairy products mostly in the form of cheese and yogurt; a low intake of meat and poultry; a regular but moderate intake of ethanol primarily in the form of wine and generally during meals (Trichopoulou, Costacou, Bamia, & Trichopoulos, 2003).

It has been shown that the beneficial effects of the traditional Mediterranean diet are attributable to the dietary pattern as a whole rather than to single components or single nutrients. It may be that the biological interactions between different components of the Mediterranean diet are responsible for the apparent beneficial health effects (Trichopoulou *et al*., 2003). Beneficial effects can also be attributed to traditional foods that incorporate the knowledge and wisdom of past generations who, living under difficult conditions have learnt how to optimize use of locally available ingredients in order to produce palatable foods and recipes with potential to improve human health (Trichopoulou *et al*., 2000). However, considerable work needs to be undertaken in order to document the reported beneficial health effects of traditional foods and to explain them in terms of generally accepted physiological mechanisms.

Traditional foods need to be systematically investigated and information on their nutritional composition needs to be included in national food composition tables. Most current national databases are lacking nutrient data on country-specific traditional foods and this information is necessary in order to accurately estimate population dietary intakes (Harrison, 2004). Moreover, the determination of the macro- and micro-nutrient composition of traditional foods is essential in order to elucidate their role in the traditional dietary patterns of the respective populations. The same applies to the bioactive components which have been implicated in health promoting effects (Kris-Etherton *et al*., 2002). An attempt to improve the current situation by enriching European national food composition databases with reliable macro, micro and bioactive component data on traditional foods has been initiated by EuroFIR. For this purpose, a work package (WP) on ‘‘Traditional Foods’’ (WP2.3.1) coordinated by the National and Kapodistrian University of Athens has been developed (www.eurofir.net).

European legislation and definition of traditional foods

Traditional foods are often considered as healthy although there are exceptions. Thus, some European traditional foods, cannot be considered healthy with current standards but even these can serve a purpose when incorporated into a dietary pattern.

In addition, traditional foods are frequently palatable and this, combined with reputed positive health effects, makes them attractive to the food industry. Food enterprises recognize a potential profit in the increased contemporary demand of traditional foods by health conscious consumers. This position has also been articulated by Jordana (2000). However, the term ‘‘traditional’’ is not adequately defined nor protected at a national legislative level. Moreover, it is often intentionally or unintentionally misused. The lack of legislation allows for occurrences of misleading food products circulating under the claim that there are traditional even though they meet few, if any, of the generally understood criteria. Therefore, the important issues of registration and standardization of traditional foods arise in order for these products (1) to be protected against imitations, (2) to be of high quality and (3) to conform to contemporary rules of appropriate and safe production. A way to ensure authenticity

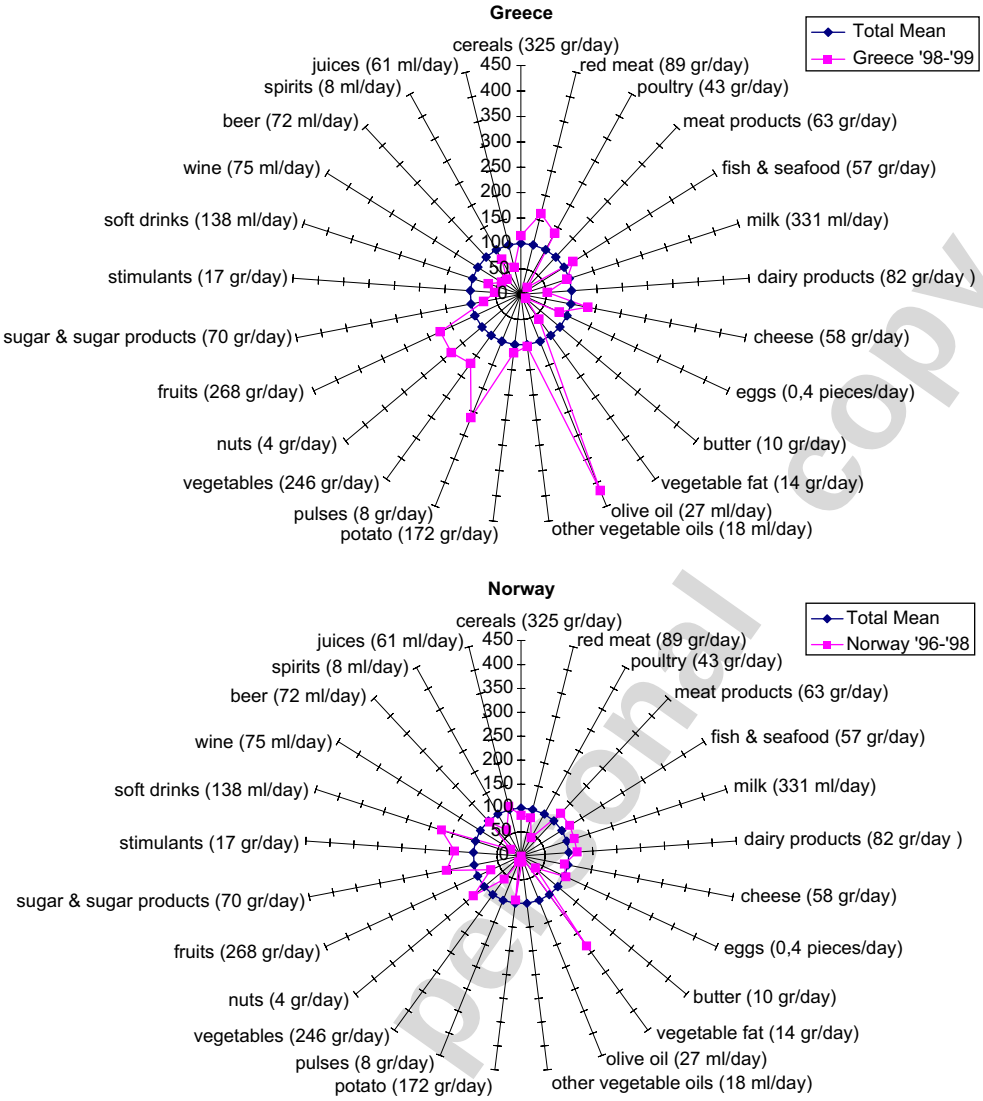

Fig. 3. Dietary pattern of a Northern and a Southern European country. Source: (A. Naska et al., 2006).

and high quality of traditional food products is to establish criteria for their registration that will thereafter determine standards for their commercial production. Cayot (2007) has pointed out that the industrialization of food production, European laws on food safety and even the development of innovative products necessitate the characterization of even the typical sensory characteristics of the traditional products.

Besides the commercial interest, the definition of the term "traditional" is a significant issue which is dealt with in the context of EuroFIR. One of the project's aims is to set a common basis for comparable food composition tables and comparable food classification schemes. Consequently, the definition of "traditional" is a prerequisite, in order to distinguish the foods considered traditional in food composition tables.

At the European Union (EU) level, there are two directives which address the issue of 'local/traditional' foods marketed within Europe:

(1) Council Regulation No 2081/92 of 14 July 1992 "On the protection of geographical indications and designations of origin for agricultural products and foodstuffs" (Commission of the European Communities, 1992a).

A month after the EuroFIR London Congress, the above regulation was replaced by Council Regulation No 510/06 of 20 March 2006 "On the protection of geographical indications and designations of origin for agricultural products and foodstuffs" (Commission of the European Communities, 2006a).

(2) Council Regulation No 2082/92 of 14 July 1992 "On Certificates of Specific Character for agricultural products and foodstuffs" (Commission of the European Communities, 1992b).

A month after the EuroFIR London Congress, the above regulation was replaced by Council Regulation No 509/06 of 20 March 2006 "On agricultural products and foodstuffs as traditional specialities

guaranteed'' (Commission of the European Communities, 2006b).

These regulations aim to provide a simple system for the protection of food names on a geographical or traditional basis. The regulation covering ''Protected Designation of Origin (PDO)'' or ''Protected Geographical Indication (PGI)'' has been successfully implemented and many European foods have been registered. On the contrary, very few foods have been certified as ''Traditional Specialty Guaranteed (TSG)''. This could be partly due to the lack of a distinct definition of the term ''traditional'' in the regulation 2082/92, resulting in an inability to ensure the exclusive registration of traditional foods, especially with respect to composite foods.

The EuroFIR scientific working group on ''Traditional Foods'' (WP2.3.1), established in January 2005, recognized the lack, at the time, of a definition for traditional foods both at the EU level, and the national level. The working group attempted to define the term ''traditional'' in the context of EuroFIR, in order to classify traditional foods in European food composition databases. Initially, a review was undertaken of national legislation in the 12 participating European countries. The review showed that only in one country, namely Italy, a legal definition of ''traditional'' existed, as follows: ''Traditional products are defined as: Agrifood products whose methods of processing, storage and ripening are consolidated with time according to uniform and constant local use'' (Decreto Legislativo 30 Aprile 1998, n.173; Decreto Ministero Agricoltura 8 Settembre 1999, n.350). In the other participating countries there were only ordinances transposing or translating the existing EU regulations 2081 and 2082. It was decided that the EuroFIR working group should work in line with the EU directives.

Composite foods based on traditional recipes were covered by EU regulation 2082. The EuroFIR scientific working group focused on this regulation and made an attempt at the 1st workshop (March, 2005, Lisbon) to define the basic terms invoked in this regulation: traditional raw material, traditional composition and traditional type of production and/or processing. The proposed definitions of the Greek scientific working group of the Agricultural Products Certification & Control Organisation (AGROCERT) referring to regulation 2082 served as the basis for the outline of the ''traditional'' concept by the EuroFIR working group (Trichopoulou, Vasilopoulou, Georga, Soukara, & Dilis, 2006).

The ''working definitions'' agreed upon at the 1st workshop were circulated for commenting and evaluation among WP participants. Following almost a year of productive discussions on this issue and having taken into consideration the comments/propositions received by the EuroFIR User and Advisory Group, a 2nd workshop was held (January 2006, Athens) in order to finalize the definitions. The final definitions accepted in the 2nd workshop and recommended for approval by the EuroFIR Scientific Management Board are the following:

Traditional food

Traditional means conforming to established practice or specifications prior to the Second World War.

Traditional food is a food of a specific feature or features, which distinguish it clearly from other similar products of the same category in terms of the use of ''traditional ingredients'' (raw materials or primary products) or ''traditional composition'' or ''traditional type of production and/or processing method'' as defined below:

- Traditional ingredients (raw material or primary product)
- Traditional composition
- Traditional type of production and/or processing

Traditional ingredient (raw material or primary product)

Raw material (species and/or varieties) or primary product either alone or as an ingredient, that has been used in identifiable geographical areas and remains in use today (*taking into account cases where use was abandoned for a time and then reinstated*) and its characteristics are in accordance with current specifications of national and EU legislation.

Traditional composition

The uniquely identifiable composition (in terms of ingredients) that was first established prior to the Second World War and passed down through generations by oral or other means (*taking into account cases where composition was abandoned for a time and then reinstated*) and when necessary is differentiated from the composition defined by the generally recognized characteristics of the wider food group to which the product belongs.

Traditional type of production and/or processing

The production and/or processing of a food that:

- Has been transmitted from generation to generation through oral tradition or other means, and
- Has been applied prior to the Second World War and remains in use (*taking into account cases where application was abandoned for a time and then reinstated*) despite its adjustment to binding rules from national or EU food hygiene regulations or the incorporation of technological progress, under the condition that production and/or processing remains in line with methods used originally and that the food's intrinsic features such as its physical, chemical, microbiological or organoleptic features are maintained.

The selected time limit ''prior to the Second World War'' implies ''prior to the era of mass food production'' and it delineates the period when populations still applied simple and time-honoured approaches. This is before the introduction of technological innovations that substantially altered the food production processes.

Study of European traditional foods in EuroFIR

The National and Kapodistrian University of Athens (NKUA) represented by the Department of Hygiene and Epidemiology, School of Medicine, acts as the coordinator of WP2.3.1 on ''Traditional Foods'' in EuroFIR. The Department of Hygiene and Epidemiology at NKUA has been involved in the systematic investigation of traditional Greek foods since 1992. Through a series of research projects, co-financed by the Hellenic Secretariat for Research and Technology and the European Union (www.nut.uoa.gr), it has developed a multi-faceted framework for the systematic investigation of traditional Greek foods and recipes, which involves:

- Historical and folkloric review, which documents the traditional identity of the foods.
- Determination of the nutrient and non-nutrient composition of primary and composite traditional foods.
- Recording of the traditional production methods (detailed written description as well as audio–visual material).
- Technological study of the potential industrial or semi-industrial production of the foods.
- Formation of integrated records related to the traditional character and properties, which may be used in proprietary claims.

In the context of EuroFIR, the experience gained on traditional foods by the Department of Hygiene and Epidemiology of NKUA will be shared and further built upon by the substantial contributions of twelve European countries participating in WP2.3.1 ''Traditional foods'' (Austria, Belgium, Bulgaria, Denmark, Germany, Greece, Iceland, Italy, Poland, Portugal, Spain and Turkey). The research framework developed by Department of Hygiene and Epidemiology of NKUA takes into account cultural, health and standardization aspects of traditional foods. This framework together with the developed protocol for the recording of the traditional recipes and the collection and preparation of laboratory samples will be adapted to the needs of EuroFIR. A pilot study will be conducted on a restricted number of five food samples per country in order to obtain experience and know-how on the systematic study of traditional foods. Thus, a common methodology for the investigation of traditional foods will be gradually established across Europe. This will allow countries to further investigate their traditional foods at a national level and to continuously update their national food composition tables with reliable and comparable new data on traditional foods. The selection procedure of the traditional foods and recipes to be included in the pilot study has three steps (documentation, prioritization and evaluation) as described below:

Documentation

Traditional food national documentation files and guidelines for completion were developed by WP2.3.1 participants. The documentation files consist of five fields of information:

1. Description of each food
2. Documentation of the traditional character of the food according to the WP definitions
3. Consumption data on the food or the wider food category
4. Availability or not of compositional data of the food or the wider food category
5. Coded references linked to all above fields of information

The main obstacle encountered by participants during the documentation procedure was the lack of consumption data for traditional foods.

Prioritization

Guidelines for the prioritization of traditional foods included in the country-specific national documentation files were developed by WP2.3.1 participants. All participants agreed on the following criteria:

1. Documentation of traditional character
2. Availability and quality of composition data
3. Consumption data

In cases where consumption data were unavailable participants were asked to provide ''guestimates'' of ''frequent'' and ''not frequent'' consumption.

Evaluation and selection

The top five prioritized traditional foods and/or recipes, per country, were further evaluated in the 2nd workshop and additional criteria such as health implications and marketing potential were taken into account.

With these procedures, EuroFIR has developed a list of traditional foods for investigation in the pilot study. The provisionally selected foods are presented in Table 1 and are open to further evaluation from the EuroFIR consortium.

As indicated the common methodology for the study of traditional foods in EuroFIR will rely on the investigation framework developed by NKUA. Following the pilot study, the traditional foods with no available compositional data may be investigated by the participants in the context of future research activities at a national level. Thus, national food composition tables can be gradually updated with the newly acquired data, harmonized according to EuroFIR guidelines.

Other WP2.3.1 participants have supplemented the Greek experience and guidelines have been developed for the recording of traditional recipes and the collection, preparation and distribution of laboratory samples. This procedure is essential to ensure that representative and reliable food samples will be analysed. Further input of experts

Table 1. Selected provisional WP2.3.1 traditional recipes and/or ingredients for inclusion in the EuroFIR pilot study

Country	Selected recipes and/or ingredients in English and national language				
Austria	Cut-up pancake (Kaiserschmarrn)	Buckwheat dish	Broad beans, cooked	Cured sausage	Potato dumplings (Erdäpfelknödel)
Belgium	Waffles from Brussels (Brusselse wafel)	Cherry pie (Kriekentaart; basis gistdeeg)	Flemish stew (Vlaamse stoofkarbonnade)	Meat loaf, meatballs	Grated Belgian endives (Grondwitloof)
Bulgaria	Cold soup (Tarator)	Tripe soup (Shkembe)	Rose jam (Sladko ot rozi)	Pepper relish (Liutenitza)	Nettle with rice
Denmark	Curly kale, raw	Curly kale, stewed (Grøn langkål)	Parsley sauce (Persillesovs)	Herring, raw	Herring, fried (Stegt sild)
Germany	Sauerkraut	Smoked ham (Black Forest) (Schwarzwälder Schinken)	Fried sausage from Thüringen (Thüringer Rostbratwurst)	German ravioli, Swabian (Maultaschen)	Wholemeal rye bread
Greece	Olive bread (Eliopsomo)	Snails, raw (Hohli or Saligaria)	Snails boubouristi (Hohli boubouristi)	Sea urchin (Achinos)	Pearl onions, cooked (kremidia stifado)
Iceland	Cheese: Skyr	Pickled blood pudding (Súr blóðmör)	Stockfish: Haddock (Harðfiskur (ýsa))	Cured shark (Kæstur hákarl)	Cured skate (Kæst kata)
Italy	Ricotta stuffed roll (Cannolo alla ricotta)	Vicentina cod (Baccalà alla vicentina)	Neapolitan Margherita pizza	Braised beef with barolo (Brasato al Barolo)	Castagnaccio
Poland	Smoked ewe's milk cheese (Oscypek)	Tree cake (Sekacz)	Cold soup (Chlodnik)	Dumplings stuffed with sauerkraut and mushrooms (Pierogi z kapusta i grzybami)	Stewed dish made of sauerkraut, meat and mushrooms (Bigos)
Portugal	Portuguese boiled dinner (Cozido à portuguesa)	Cod with chick-peas (Bacalhau com grão)	Green cabbage soup (Caldo verde)	Roasted goat kid (Cabrito assado)	Egg sweet from Murca (Toucinho do céu de Murça)
Spain	Spicy vegetable sauce (Mojo Picón)	Stewed vegetables (Pisto Manchego)	Cardoon in almond sauce (Cardo con salsa de almendras)	Roasted pepper/ aubergine salad (Escalivada)	Galician octopus (Pulpo Feira)
Turkey	Tarhana soup (Tarhana çorbası)	Baklava	Pastırma	Kebab	Bulgur, raw

will be sought before the guidelines are finalized and applied in the pilot study.

Conclusion

There are many different cultures within Europe and each one has its own and distinct dietary habits. Traditional foods include foods that have been consumed locally or regionally for an extensive time period. Methods for the preparation of such foods have been passed down through generations and are now part of the folklore of the country. There is, however, little documented information about the precise composition of these foods.

The scientific investigation of traditional foods and the creation of a common European definition for the term ''traditional'' are prerequisites for incorporating these food products into national and European food composition databases. Available data on the nutrient and bioactive composition of traditional foods will further allow for the undertaking of studies focused on their effects on human health.

For the production of traditional foods, local products are generally used. Cultivation of local products contributes to a sustainable environment and employment of local people (FAO, 2004).

The 'healthy and palatable' combination is very attractive to the food industry and traditional foods could potentially be mass produced and exported. However, unless this production is carefully overseen, there is a risk that poor imitations of traditional foods could be produced, misleading the consumers. This highlights the need to legislate and standardize traditional foods in order to protect the products, the producers and the consumers. The registration of traditional foods could motivate their small-scale production throughout Europe and expand their export potential to countries outside the ones in which they originate (Tregear, Arfini, Belletti, & Marescotti, 2007). The multi-faceted investigation framework which will be applied in EuroFIR, includes an on the spot detailed recording of the traditional recipe. This could prove useful to the standardization of the food's potential semi-industrial production and, combined with the emerging analytical data, could motivate local producers to register their traditional products.

Investigation and registration of traditional foods contributes to the preservation of important elements of a nation's culinary heritage and culture. This allows future generations, both from the native population and from other countries, to be acquainted with, and to experience traditional foods. Unfortunately, throughout Europe some traditional foods are threatened with extinction due to altered lifestyles. Therefore, there is a genuine need to study traditional foods to preserve important elements of European culture and, if possible, enrich and improve the diet of the populations across the whole continent.

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