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European Research on Traditional Foods

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Foreword



Traditional foods are a significant element of every European Member State's cultural heritage and their production and sale are critical economic inputs to many regions. Europe lays claim to many local culinary specialities and has established a system to protect registered traditional foods giving a valuable framework for local producers to market distinctive high quality regional products. However, as lifestyles change, many traditional foods are viewed differently by consumers. How can they be made more sustainable and available to a wider market?

Increasing the opportunities for these products through improved competitiveness and enhanced marketing is a key part of rural sustainable development and can contribute to the Lisbon Strategy for increased growth, employment and social welfare. However, to innovate successfully and seize the available opportunities the many small and medium enterprises (SMEs) involved need support. The solution requires modernisation of all aspects of the traditional food industry, including improved logistics and distribution, whilst ensuring that their products remain safe and of the highest quality. SMEs must extend their skills in marketing, modern production techniques and management, as well as in promoting the aspects of their products related to nutrition and health that can drive consumer demand. Sound scientific health claims coupled with registered origins can together provide an excellent platform for increased consumer benefits from traditional foods.

This publication outlines the support being given by the EC Framework Programmes to sustain and promote high-quality traditional and regional foods; it highlights the challenges to be addressed and emphasises the research that has already been undertaken and is continuing in this area. As we move towards the European knowledge-based bio-economy, this research demonstrates the value of exchanging knowledge at many levels. Food technology research is helping to ensure food quality in the production of traditional foods leading to new opportunities for producers. In parallel, much new information on the health benefits of these products and ingredients is providing insights on links between diet and health. This can benefit society by offering healthy diet options and expanding consumer choice.

European traditional food is both a knowledge resource and part of our cultural heritage. Research is supporting its continuing and increasing contribution to sustainable economic development and the improvement of the health and well-being of all European consumers.

A handwritten signature in dark ink, appearing to read 'C. Patermann', written in a cursive style.

Christian Patermann
Director of Biotechnology, Agriculture & Food Research
DG Research

What are traditional foods?

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Within Europe, there are many different cultures, each with their own, often distinctive, dietary traditions. Traditional foods include foods that have been consumed locally or regionally for many generations. The methods for preparation of these local specialities have been passed down from generation to generation and have become part of the fabric of life in many communities. In some cases, they are not formally documented recipes, but are often associated with positive health benefits and always with local history.

This diversity of traditional produce offers a wealth of consumer choice in high quality European food products and a significant potential competitive advantage for the European food industry.

Traditional foods are often considered healthy and wholesome and, as public interest in nutrition and healthy eating has increased, there has also been an increase in demand for traditional foods.

Defining tradition

Traditional food can mean a million different things to a million individuals. Obtaining agreement on a definition that fully encompasses the variety of products is not an easy task. Two European Commission FP6 funded projects are currently dealing with the concept of traditional foods.

TRUEFOOD¹, an Integrated Project aiming to introduce innovation into the traditional food production systems, is looking at different ways the word tradition is developed and communicated, based on the aspects of its production, authenticity, commercial availability and gastronomic heritage.

In EuroFIR², an European Food Information Resource Network of Excellence, some definitions have also been developed, based on reviews of national and EU regulations, aiming to provide a common European definition to apply for food composition table classifications.

Quality products – Quality marks

Traditional food products are often the fruit of agricultural practices that preserve and enhance rural environments. In fact, their production is very much in line with current European Union thinking on rural development, preservation of biodiversity and sustainability.

The unique quality and cultural characteristics, and the need to protect the knowledge and skills inherent in traditional and regional foods from lower quality imitation, has led to the establishment of a system of product registration using voluntary quality marks in Europe.

These are the Protected Geographical Indications (PGI), Protected Designations of Origin (PDO) and Traditional Specialities Guaranteed (TSG) labelling (see box). The labels designate food products coming exclusively from one area of the EU, made using recognised local know-how, with a clear geographic relationship to a certain part of the EU and made from traditional ingredients or using traditional methods. The labelling system gives the producer a simple system for protection of intellectual property or know-how and acts as a clear quality mark for consumers.

The concept is a continent-wide extension of the thinking that developed national schemes for quality assurance, such as the long-standing French 'Appellation Contrôlée' system for wines and spirits.

Products that can be protected under the PDO, PGI and TSG systems cover a wide range and includes fresh meat and meat-based produce, cheeses, fruit, fish, beer and other beverages made from plant extracts, bread, pastries and other confectionery. The number of regional and speciality products other than wine for which names are registered under these EU quality schemes now stands at over 720 and is still growing every year.

¹ www.truefood.eu/

² www.eurofir.net/



What the labels mean³

A **PDO (Protected Designation of Origin)** covers the term used to describe foodstuffs which are produced, processed and prepared in a given geographical area using recognised know-how.

In the case of the **PGI (Protected Geographical Indication)**, the geographical link must occur in at least one of the stages of production, processing or preparation. Furthermore, the product must benefit from a good reputation.

A **TSG (Traditional Speciality Guaranteed)** does not refer to the origin but highlights traditional character, either in its composition or its means of production.

³ For more information: http://ec.europa.eu/agriculture/foodqual/quali1_en.htm

Traditional foods: challenge and opportunity

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Although a small number of large companies are responsible for over 50% of the sector's turnover, the food and drink industry is characterised by a predominance of SMEs. These companies, usually with low internal R&D investment, might however be genuine innovators, since they often have an expansive business profile and are looking continually for opportunities for development.

Innovation challenge

A significant challenge for traditional food production is to improve its competitiveness by identifying innovations that guarantee the safety of the products, while at the same time meeting general consumer demands and specific consumer expectations and attitudes towards traditional food.

Traditional and regional foods are considered a legacy passed down within communities, and consumers expect a particular sensory experience with high nutritional value. At the same time, it is required that these products are safe from the microbiological point of view, not extensively processed and with low preservative content.

The integration of the rich traditions of European cuisine with the innovation-driven consumer market is a particularly challenging task for the food SMEs.

Lack of access to facilities or capital can often hold back innovation in SMEs – although there are many exceptions (see box). Some sectors of the traditional food industry have been slow to identify and introduce innovations in primary production or processing that can improve nutritional values while maintaining or enhancing their sensory qualities.

A central goal of EU policy is to increase the competitiveness of the traditional food sector through support to improve food safety and quality characteristics that can be translated into greater consumer demand.

SMEs can innovate!

A recent survey by SME-Net⁴, a network of SMEs working in the European food industry, considered the level of innovation throughout the industry. They found that smaller companies were as or more likely to be innovative both in terms of product and market development as very large companies. Although often lacking the research capacity of larger enterprises, SMEs can be skilled “informal” innovators with a high motivation to invest and a strong ability to react swiftly to new opportunities in their market.

Technology Transfer

A key aspect of the innovation challenge is to ensure the identification, evaluation and transfer of appropriate technology into the traditional food industry.

Another important aspect of knowledge transfer is within the industry itself. Throughout Europe, many traditional foods are threatened as lifestyles are changed and local know-how is lost. Systematic investigation and registration of traditional foods can help keep them on the menu, thus enabling future generations to experience and enjoy traditional local specialities.

Sustaining tradition

The future looks encouraging. Traditional foods are natural, healthy, respect the environment, and have great taste and cultural values, that are increasingly attractive to consumers.

They are part of what makes us different and yet unites us. They are part of our European heritage, but are also very much part of the future knowledge-based bio-economy.

⁴ SMES-NET is a Specific Support Action funded under the Community's Sixth Framework Programme Thematic Priority 5: "Food Quality and Safety", Contract n° FOOD-CT-2005-514050 (<http://smes-net.ciaa.eu/asp/home.asp>)

Food Industry Facts⁵

The twenty-seven countries of the European Union in 2007 have a combined population of over 492 million.

The EU-27 counts over 20 million farmers.

The European food and drink industry (EU-25) had an annual turnover of €836 billion in 2005 and is the largest manufacturing sector in the EU ahead of the automobile and chemical industries. It employed 3.8 million people. The sector is a net exporter with a trade surplus in 2005 for the EU-25 of € 4.5 billion representing 20% of the global export market.

SMEs made up 99% of the approximately 282 600 Food and Drink companies operating in the EU-25. These small companies produced 90% of the EU's food and drink product lines. In fact, European food companies are mostly (78.9%) micro, employing nine people or less, or small (16.6%) with between 10 and 39 employees.

In 2005, about 12.4% of European household expenditure was spent on food and non-alcoholic beverages.



⁵ CIAA, Confederation of the food and drink industries of the EU (http://www.ciaa.eu/documents/brochures/Data_&_Trends_2006_FINAL.pdf)

European food research

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Quality-control tools have reinforced and harmonised European and national legislation to help ensure that only the best food reaches our plates.

Consolidated production and distribution chains also help to ensure that the food on our tables is both fresh and appetising. The complex web of global supply systems requires effective controls to be in place at every link in the food chain, but also necessitates efficient and effective cross-border scientific and legislative cooperation.

However, recent food scandals and changes in consumer demands keep the issues of food quality and safety high on the European political agenda. In response, the European Commission focuses on key areas such as the protection of consumers, public health and measures to protect the environment.

A key part of this action is providing citizens with clear and accurate information on food issues and enhancing the interaction between consumers and food professionals to foster increased levels of confidence in all aspects of the food we eat.

The European approach – “Fork to farm”

To raise the challenge of providing safe food for everyone, Europe has embraced a holistic approach that is described by the motto: ‘From Fork to Farm’. This reflects a consumer-orientated emphasis and unifies programmes on food, health and well-being.

“Food quality and safety” has grown into a significant area of European research. It was one of seven thematic priorities in the Sixth Framework Programme (FP6) from 2002 to the end of 2006, where 189 projects were selected for funding under the four calls for proposals, and involving a total EC contribution of more than €750 million. This compares with the previous FP5 programme where the Commission contributed under the Quality of Life Programme

some 12% of the budget (€264 million) specifically to food, health and nutrition research.

FP7 – future activities

From 2007 to 2013, the European Commission is funding research under the Seventh Framework Programme (FP7). This is the EU’s most ambitious research programme to date, with a considerable increase in the annual research budget. It aims to mobilise Europe’s greatest natural resource: knowledge.

The main Cooperation Programme in FP7 is divided into ten themes. Theme two is ‘Food, Agriculture and Fisheries, and Biotechnology’ with an overall budget of €1.9 billion.

The theme is built around three major activities, one of which is “Fork to farm: Food (including seafood), health and well-being”. This activity covers key aspects of food quality, safety and consumer concerns along the entire food production chain and will cover further research on areas of importance to the traditional food sector.

Research topics include:

- Consumer, societal, cultural, industrial and health as well as traditional aspects of food and feed, including behavioural and cognitive sciences.
- Nutritional research work on diet-related diseases and disorders and the prevention of disease
- Innovative food and feed processing technologies enhancing safety assurance methodologies and the integrity of the food chain
- Improving food quality and safety in food, beverages and feeds and development of new ingredients and products
- Environmental impacts on and of food and feed chains and their interactions with global change; total food chain concept, traceability and authenticity of food.

Towards a knowledge-based bio-economy

The bio-economy – collectively referring to the sectors that derive their products from biological resources – is one of the oldest economic sectors known to humanity, but the life sciences and biotechnology are transforming it into one of the newest and most important for the future. Building the Knowledge Based Bio Economy (KBBE) is a primary objective of FP7 Food, Agriculture and Fisheries and Biotechnology activities, and the traditional food sector has a significant part to play in this future scenario. The KBBE will promote Europe's leading and most innovative knowledge to increase productivity and competitiveness, and improve our quality of life, while protecting the environment and the European social model.

Worth an estimated €1.6 trillion a year in Europe alone, the bio-economy could further sharpen its competitive edge through sharing and using knowledge, and applying the 'old' know-how of traditional foods

to new areas is one way to do it. This, in turn, can help rural development and sustainability, ensure the long-term competitiveness of the European farming, food and chemical industries, and make a positive environmental impact, too.



Traditional food research: meeting the challenge

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Many of the research projects commissioned under FP5 and FP6 have direct impact on the challenges faced by traditional and regional foods. Some of the projects are completed and others are currently on-going. Their contributions in meeting the various challenges faced by the sector are briefly outlined below and further details can be found in the individual project sheets collated within this brochure.

Understanding the market

Consumer behaviour is a major factor in the competitiveness of the food industry and the impact that food can have on general public health, and the well-being of European citizens. Research can reveal consumer perceptions, illuminate our attitudes towards food and provide data on societal trends. In essence, it can identify why we choose the food we eat and highlight any specific barriers to consumer access to certain food types.

Understanding how consumers react to traditional food will help with marketing the products and in identifying further areas for research. Assessing consumer attitudes to foods is a complex scientific area and integrates aspects of physical and social sciences.

The **TRACE** Integrated Project is helping European citizens to track where their food comes from and give consumers added confidence in the authenticity of European food products. It will also assess European consumer attitudes to designated-origin products giving a basis for improving marketing materials.

In a complimentary action the technology developed in the **TYPIC** project can rapidly evaluate basic sensory perceptions of traditional food products to improve authentication procedures. Its findings suggest that, with effective marketing, DO-labelled products have a real opportunity in international markets.

In addition, initiatives such as the **DAFNE** network allow access to long-term consumer trends via data that is

harmonised across Europe. This network has monitored changes in Europe's diet since 1987. The Data Food Networking project uses data from national Household Budget Surveys that includes both socio-economic and dietary information allowing scientists and policy-makers to observe nutritional trends and differences across geographical and social classes.

Linking diet and health benefits

Dietary factors and habits are a major controllable factor in the reduction of diet-related diseases. Understanding more clearly the biological and physiological links between **nutrition and health** will involve the development and application of nutrigenomics and systems biology, and the study of the interactions between nutrition, physiological and psychological functions. This could lead to reformulation of processed foods, and development of novel foods, dietetic products and foods with nutritional and health claims –able to target specific consumer groups with special dietary needs.

The investigation of traditional, local, and seasonal foods and diets is important to this area, as it can highlight the impact of certain foods and diets on health, and assist in developing better integrated food policy guidance.

Further understanding of the links between traditional food components and positive health benefits is being undertaken in a number of projects. This work is providing scientific validation and quantification of the added-value of traditional foods. It will boost the food products themselves and can provide new markets, in areas such as nutraceuticals and pharmaceuticals.

All types of olive oil can improve the human body's blood lipid profile, antioxidant defences and help protect its DNA from oxidative attack, according to the **EUROLIVE** project. The higher the phenolic content of the olive oil, the greater the health benefits.

The **IMMIDIET** project showed how migration from southern to northern Europe can change an individual's diet and its clear effects on health. In particular, the project showed the value of promoting healthy diets options for the prevention of heart disease. Its results should have a significant impact on European health policies and nutritional communication campaigns.

By scientific analysis of the valuable active ingredients found in a wide variety of traditional plant products and ingredients, the **LOCAL FOOD-NUTRACEUTICALS** project has promoted the continued use of these crops in local communities. The findings will provide new markets for the crops in nutraceutical applications and food additives that should require increased production and provide opportunities for jobs and growth in a number of rural regions

Recognising that diet plays a significant role in health, the extensive **EuroFIR** network is setting up a comprehensive databank containing information on nutrients and new bioactive compounds, including those from traditional and ethnic foods, which have potential health benefits. This work can again help enlarge the market for traditional food ingredients, as well as providing evidence of the health 'value-added' in a number of traditional food products.

Innovation challenge

Ensuring that the European food industry remains innovative through the use of appropriate advanced technologies in traditional **food processing** is a main priority to improve competitiveness. Other actions include new process technologies to enhance the functionality of food, the development and demonstration of high-tech, eco-efficient processing and packaging, smart control applications and more efficient management of by-products, waste and energy.

Promoting the inherent benefits of traditional foods is one aspect of the drive to introduce more effective marketing



and improved supply processes to traditional food businesses. Innovative packaging both in terms of its design and function can help in this area and training for staff and owners in all aspects of business will boost their competitiveness. Ensuring that companies are equipped for business in the modern world (in terms of ICT, etc.), so they are able to interface effectively with global markets, is also a key factor.

The FP6 integrated project **TRUEFOOD** is a significant effort to bring innovation into all aspects of the traditional food industry and enhance its competitiveness. The project aims to improve quality and safety and focuses on increasing value to both consumers and producers, supporting the development of realistic business plans for all components of the food chain, using a fork to farm approach. It covers work on consumer perceptions, innovation and technology transfer, marketing and supply chain development, and is highly focused on engaging SMEs.

Robust methods for authenticating traditional foods are essential as part of scaling-up production and retaining the foods characteristics – its 'typicality'. It is also important for protecting the food from imitation and maintaining the added-value and quality of the product.

Ensuring safety through innovation

Ensuring chemical and microbiological safety of food products is paramount and goes hand-in-hand with improving **quality** in European food supply. Improved understanding of the links between microbial ecology and food **safety**, developing methods and models addressing the integrity of the food supply chain and novel methods of detecting contamination are all necessary. In addition, technologies and tools for risk assessment, management, and communication are needed to ensure that the risk perceived by the public reflects the actual reality.

The successful application of Hazard Analysis and Critical Control Point (HACCP) procedures (see box) in food production requires scientific data to establish the basis for control. For many traditional foods, this requires better understanding of the microbiological environment in which the food is produced as this is an essential element of the product's unique characteristics, but is also a potential source of risk. From this research, appropriate strategies, including microbiological strategies, can be developed.

A fuller understanding of the complex microbial communities that are fundamental to red-smear cheeses' characteristics has been obtained in the **SCM** project. Model cheese cultures have been developed to increase safety without affecting the characteristic sensory qualities of these traditional dairy products.

A series of recommendations on controlling *L. monocytogenes* in artisanal cheese-making dairies were produced by the **LMTOOCHE** project. The use of HACCP analysis identified five critical control points: the raw milk, handling of cheeses, temperature monitoring during cheese maturation, cheese washing, and the use of the appropriate quality of salt.

Compliance with food safety is a critical requirement for all food. While the framework for food safety is a common one, it does accommodate diversity. The EU

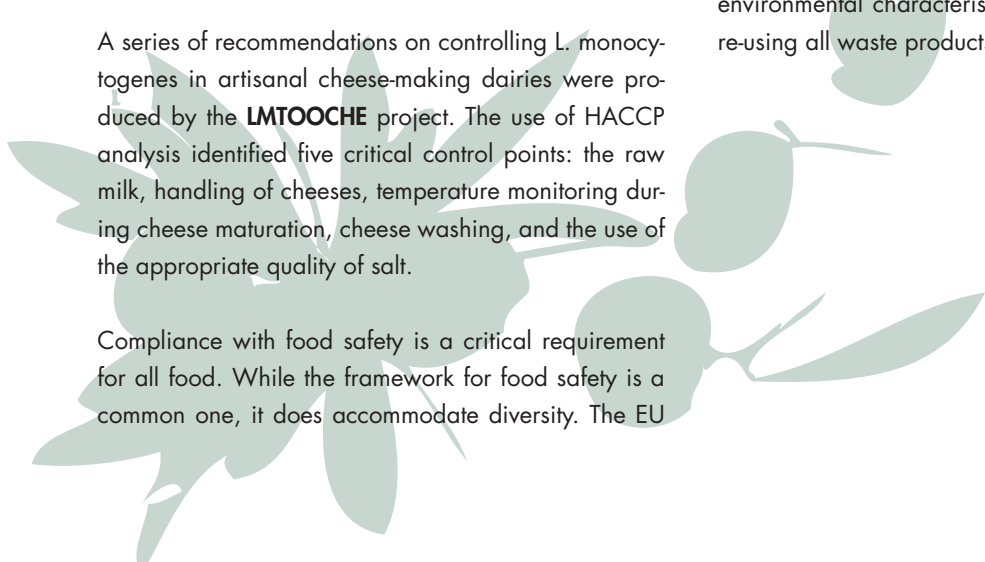
takes great care in ensuring 'better regulation' in this area. This allows for quality improvements and ensures that innovation is not stifled and that variety and choice are not curtailed.

A good example is a guide of good hygienic practices produced by **TRADISAUSAGE** can help traditional producers to make high quality products through better control of sanitary risks. Its recommendation sheets are available in six languages and are easy to understand and apply. The result will assist small producers to comply with HACCP procedures with minimum disruption.

Sustainable development

Finally, protecting both human health and the environment requires a better understanding of the **environmental impact** of producing, transporting and using modern food products. This includes study of food contaminants and health outcomes, developing enhanced tools and methods for the assessment of impacts of food and feed chains on the environment. Quality assurance and integrity of the food chain call for new models for commodity chain analysis and total food chain management concepts.

The **TDC-OLIVE** project under FP6 is an excellent example of work in this area. It has developed a 'model' modern business plan for SMEs in the olive industry. Using high-tech processes, the SME can produce optimum product quality and the company gains excellent environmental characteristics by treating, recycling or re-using all waste products it generates.



HACCP⁶

European health and hygiene regulations require food business operators to put in place, implement and maintain a permanent procedure based on the Hazard Analysis and Critical Control Point (HACCP) principles. This is an area that encompasses aspects of food processing, food safety and health issues.

The HACCP concept is science-based and systematic by identifying specific hazards and measuring their control to ensure the safety of food. The focus is on prevention rather than end-product testing.

HACCP requirements should provide sufficient flexibility in all situations and this includes in small businesses. This means that for small producers evidence of good hygienic practice can replace a requirement to establish a system to monitor specific control points in the production process as an application of 'better regulation'. In addition, requirements to retain extensive documentation can be flexible to avoid undue bureaucratic burdens for very small businesses.

HACCP is designed to be applied throughout the food chain and its implementation guided by scientific evidence of risk to human health. As well as enhancing food safety, implementation of HACCP can ease inspection by regulatory authorities and promote international trade by raising confidence in food safety.



⁶ For more information: http://ec.europa.eu/food/index_en.htm

More information

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<http://ec.europa.eu/research/infocentre/>

FP6 Food Quality and Safety

http://ec.europa.eu/research/fp6/index_en.cfm?p=5

Information on FP6 Food projects

<http://cordis.europa.eu/food/>

FP7

http://cordis.europa.eu/fp7/cooperation/food_en.html

FP6 general information

http://ec.europa.eu/research/fp6/index_en.cfm?p=0

FP5 Food, Nutrition & Health

http://ec.europa.eu/research/quality-of-life/ka1/home_en.htm

Overview of EU Food Policy

http://europa.eu/pol/food/overview_en.htm

CIAA – the European Food and Drink Industry Association

<http://www.ciaa.be>

European Technology Platform 'Food for Life'

<http://etp.ciaa.eu/asp/home/welcome.asp>



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Monitoring the european diet (DAFNE)

DAFNE is short for Data Food Networking - a databank established to monitor over time trends in food habits across Europe. The database collates and coordinates the results of Household Budget Surveys (HBS) collected by its member institutions for use by any interested party. The data includes both socio-economic and dietary information making it a very useful tool for a wide range of stakeholders. Initiated in 1987, the DAFNE network has continually expanded and now includes members from the vast majority of countries in continental Europe.

Reliable data in a world of change

The modern world is facing rapid changes that can have unpredictable consequences, which makes the ability to monitor and compare data such as dietary patterns of different populations an important task. Both policy-makers and consumers are challenged by a wide range of concepts and conflicting messages when trying to make positive choices on critical issues such as diet. Comprehensive and reliable information based on comparable data is fundamental to sound decision-making.

The aim of the DAFNE project was to develop a European, regularly updated databank of comparable food and socio-demographic information as a tool for monitoring trends in dietary habits in Europe. The initiative was first started in 1987 with a number of workshops, seminars and pilot projects. Since 1990, Greece has been coordinating DAFNE as a joint effort by European countries to compare the food habits of their populations and monitor trends in food availability over time, through the creation of a dynamic and regularly-updated food databank. The overall aim is the development of a nutrition monitoring tool that can assist the formulation, implementation and evaluation of nutritional policies across Europe.

Analysing the household budget

The DAFNE databank is based on information collected in the context of household budget surveys (HBS). HBS are periodically conducted by the National Statistical Offices in most European countries in country-representative samples of

households. The methodology followed is uniform enough to allow comparisons between countries with minimal standardisation of data. HBS are not primarily designed to collect nutritional information, but they do record data on the value and quantities of household food purchased and can adequately depict the dietary patterns prevailing in the representative population samples. Moreover, the concurrent recording of demographic and socio-economic characteristics of the household members allows the evaluation of the impact of these characteristics on the household's dietary choices.

The DAFNE network's database allows inter-country comparisons of daily individual food availability that can be performed at different levels of detail, ranging from 56 analytical individual food groups to 15 aggregated main food groups, namely, cereals and cereal products; meat, meat products and related dishes; fish, seafood and related dishes; milk and dairy products; eggs; total added lipids (fats and oils); potatoes and other starchy roots and tubers; pulses; vegetables (excluding juices); nuts; fruits (excluding juices); vegetable and fruit juices; sugar and sugar products; non-alcoholic beverages; and alcoholic beverages.

Comparisons of the eating behaviour of various population segments can also be made. Four socio-demographic characteristics with important public health implications are used to make comparisons within and between countries. These are: the degree of urbanisation of the area where the household is situated; the household composition; the final educational level achieved by the head of the household; and his/ her occupation.

HBS data on food availability at household level, as well as relevant demographic and socio-economic characteristics collected by national centres are forwarded to the Greek centre coordinating the Data Food Networking initiative. The data is combined centrally and the raw HBS data is standardised according to procedures developed in the DAFNE project.

Identifying trends, correlations and potential interventions

The DAFNE data on average food availability (recorded in terms of g or ml/person per day) are integrated in DafneSoft (version 2.1), which is a web-based application

A taste of Europe

tool, running on the Microsoft Windows operating system allowing users to present dietary data in various formats (tables, bars, pie charts, map presentations) and at various levels of detail. It also allows users to follow trends in food availability over time, within and between various countries, study the impact of the household's locality and composition as well as of the household head's education and occupation on the daily food choices. This tool allows easy export of the data for future use in other systems.

The database can also be used to identify dietary patterns. In a recent publication, the standardised food and related data stored in the DAFNE database was used to describe the dietary patterns of ten European countries and their socio-demographic determinants. National dietary patterns were identified by means of principal components (PCs) extracted from principal component analysis using a correlation matrix.

The information can be used to assess the attainment of suggested dietary targets (such as the "five portions a day" of fruit and vegetables) in different countries and correlate diet/ nutritional data with public health data such as rate of death from certain types of cancer, etc.

Meaningful comparisons for better public health

The comparability of operational measures is crucial to the meaningful interpretation of comparisons among countries. This has been a key objective of the DAFNE initiative. A system allowing the regular update of the DAFNE database and the expansion of the network to embrace all European countries should provide a ready source of data for monitoring public health nutrition in Europe at reasonable cost.

The network allows the identification of sub-groups of the population with inappropriate diet according to the current scientific knowledge. This allows for potential intervention with these groups that can have valuable public health consequences.

The DAFNE databank is directly available to any interested user via the web-based Dafnesoft applications tool that is freely available from the DAFNE website (see below).

More information

Project website:

<http://www.nut.uoa.gr/english/dafne/DafneEN.htm>

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Project Essentials

Full Project name:

The Data Food Networking initiative

Project Acronym: DAFNE

Project type: Various

Duration: On-going

The DAFNE initiative has been supported by the European Commission through a variety of initiatives including the "Cooperation in Science and Technology with Central and Eastern European Countries", "Agriculture and Agro-Industry, including Fisheries - AIR", "Agriculture and Fisheries - FAIR", "COST Action 99 - Food Consumption and Composition Data" programmes, the Health Monitoring Programme of DG SANCO (Health and Consumer Protection) and Specific Measures in Support of International Cooperation under the EU's Sixth Research Framework Programme.

Project Collaborators:

Ministry of Health, Tirana (AL), Institute of Nutritional Sciences, University of Vienna (AT), Dept. of Food Safety and Food Quality, University of Ghent (BE), Croatian National Institute of Public Health, Zagreb (HR), Ministry of Health, Department of Medical and Public Services, Nicosia (CY), Statistics Finland, Helsinki (FI), French Food Safety Agency (AFFSA) (FR), Technical University of Munich (DE), National Institute of Food Hygiene and Nutrition, Budapest (HU), Department of Hygiene and Epidemiology, University of Athens Medical School (GR), National Nutrition Surveillance Centre, Department of Health Promotion, National University of Ireland, Galway (IE), National Research Institute for Food and Nutrition (INRAN), Rome (IT), Latvian Food Centre, Riga (LV), Ministry of Health (LU), Health Promotion Department, Floriana (MT), Institute of Nutrition Research, University of Oslo (NO), National Food and Nutrition Institute, Warsaw (PL), Faculty of Food and Nutrition Sciences (FC-NAUP), University of Porto (PT), Institute of Public Health of Serbia, Belgrade (CS), Food Research Institute, Bratislava (SK)
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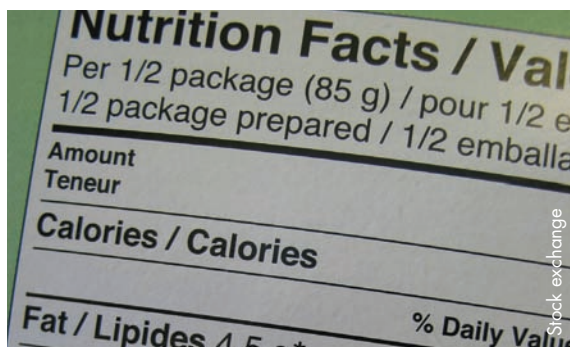


A one-stop shop for food data (EuroFIR)

There is a growing recognition that diet plays a significant role in keeping people healthy. The link between diet and health has generated considerable research throughout Europe. However, much of the research data obtained is hard to access, despite significant efforts to encourage a collaborative approach. The EuroFIR (European Food Information Resource) Network of Excellence will help set up a comprehensive and authoritative European databank system containing information on nutrients and newly-discovered bioactive compounds that have potential health benefits.

An integrated European food data resource

Food composition databases (FCDBs) provide detailed information on the nutritional composition of food products, including values for the amount of energy, protein, fat, vitamins and minerals that a particular food item contains. Such information is vital for a variety of users and different purposes ranging from public health education to epidemiology and agricultural and environmental assessments. FCDBs underpin all research activities associated with diet and health.



Currently, European countries support their own FCDBs or borrow data from other countries. This situation is not ideal, as it can hinder the needs of pan-European research collaborations in diet and health, and food safety. It can lead to large errors in estimates of nutrient intake and to inappropriate conclusions on diet-health relationships

feeding into policy-making. In particular, FCDBs form the basis on which dietary adequacy is assessed, dietary intake is measured, and risk assessments are carried out. There is a clear need to harmonise European FCDBs and improve collaboration via a permanent structure that supports national FCDB compilers and links them with other stakeholders, providing a single data resource.

Collaboration, standardisation, more information

The EuroFIR Network of Excellence will provide the first comprehensive pan-European food information resource using a state-of-the-art database linking to allow effective management, updating, extending and comparability of data. The network brings together over 40 universities, research organisations and small and medium-sized enterprises (SMEs) from across Europe. An essential step will be the standardisation of data-collection methods, food composition tables and analytical techniques so that results can be easily compared and used on a pan-European basis. This will provide an effective nutrition-monitoring system at European level to collate information on food consumption as input for efforts to improve the safety and quality of European food. The initiative will support the competitiveness of Europe's food and biotechnology industries.

The analysis will also focus on key food research areas including composite, processed and novel foods; traditional and ethnic foods (where little research has previously been done); and bioactive compounds with functional benefits. Innovative software tools will be developed by EuroFIR to handle the information flows and new electronic communication methods established to ensure that appropriate and comprehensible information is delivered to the end-users as required. Analysis of the food data collected will also reveal the most beneficial areas for new research.

Better data, improved food safety and quality

EuroFIR will become the first port of call for individuals and organisations seeking pan-European information on the composition of food. It will be a single portal to

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access a European databank system that is consistent and coherent. The network unites national database compilers with both analytical laboratories generating the data and end-users of that data from universities and research institutes specialising in nutrition. Other partners in the project include four SMEs with expertise in IT databases and software development and communication/dissemination skills. Further national data compilers and other small firms are expected to join the network as it moves forward.

The project will be of immense help to scientists working on relationships between dietary habits and chronic disease and thereby reduce the wider medical and social costs of ill health. It will also help the wider community gain access to reliable nutritional research results and a better understanding of their implications for public health nutrition. The database will be accessible to a wide range of stakeholders including policy-makers, the food industry, health professionals and concerned consumers.

Improving diet and health understanding

EuroFIR will provide an essential underpinning resource for all food and health research in Europe and could have a significant impact on our understanding of diet and health. It will help point out gaps in available data for nutrients and other biologically-active compounds that could have beneficial health effects. In addition, it will cover all food groups, including traditional and ethnic foods, novel foods, high-added value and prepared meals to ensure all aspects of the cosmopolitan and diverse European diet are taken into account.

EuroFIR aims to spread excellence and extend the impact of its activities beyond those involved directly within the consortium. It will do this through training schemes for young scientists and by sharing its methods and facilities. A public website will be set up to provide information on food composition.

More information

Project website: <http://www.eurofir.net>
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Project Essentials

Full Project name:	European Food Information Resource Network
Project Acronym:	EuroFIR
Project type:	Network of Excellence
Theme:	Food Quality and Safety
Contract No.:	FOOD-CT-2005-513944
Project Start Date:	01/01/2005
Duration:	60 months
Total Budget:	€ 13 000 000
EC Contribution:	€ 12 000 000

Project Collaborators:

Institute of Food Research (UK), Graz University of Technology (AT), Ghent University (BE), Nubel asbl (BE), Joint Research Centre – Institute for Reference Materials and Measurements (BE), National Centre of Hygiene, Medical Ecology and Nutrition (BG), Danish Institute for Food and Veterinary Research (DK), National Public Health Institute (FI), University of Helsinki (FI), French Food Safety Agency (FR), Technological Institute of Iceland (IS), Federal Research Centre for Nutrition and Food (DE), ILSI Europe aisbl (BE), Technology Transfer Centre, Bremerhaven (DE), National and Kapodistrian University of Athens (EL), Agricultural University of Athens (EL), University College Cork (IE), Ben-Gurion University of Negev (IL), National Institute for Research in Food and Nutrition (IT), Centre for the Study and Prevention of Cancer (IT), Wageningen University (NL), University of Oslo (NO), National Food and Nutrition Institute (PL), nacional Institute of Saúde (PT), Vienna University (AT), Centre for Superior Studies on Nutrition and Dietetics (ES), University of Granada (ES), Food Research Institute (SK), Swedish National Food Administration (SE), Swedish University of Agricultural Sciences (SE), Tubitak Marmara Research Centre Food Institute (TR), British Nutrition Foundation (UK), European Molecular Biology Laboratory – European Bioinformatics Institute (UK), Central Science Laboratory (UK), University of Leeds (UK), University of Surrey (UK), Baigent Ltd (UK), RIKILT Institute of Food Safety (NL), Polytec (DK), Food Information Consultancy (UK), National Nutrition Centre (LT), ETH Zürich (CH), Institute for Medical Research University of Belgrade (RS), Food Centre of Food and Veterinary Service of Latvia (LV), Netherlands Organisation for Applied Scientific Research (TNO), representing NEVO Foundation (NL)



Olive oil – the perfect protection?

(EUROLIVE)

The benefits of olive oil, which makes up the major part of the fat component consumed in the traditional Mediterranean diet, have been widely recognised. However, there is a lack of hard data concerning the health effects *in vivo* of virgin olive oil versus other types of olive or edible oil and mono-saturated fat-rich products. Yet this is an important factor in establishing public health dietary strategies for disease prevention. The EUROLIVE project assessed the impact of a variety of olive oils on a number of risk factors for heart disease and developed new methods for characterisation and quantification of olive oil components and their metabolised equivalents. The results show that all olive oil types assessed have a protective effect.

Scientific link to a healthy diet

The health benefits of a Mediterranean diet are well recognised but the actual biological effects of consumption of its various components are not fully understood. Also, the actual chemical composition of all foods, including olive oil, varies widely depending on factors such as its growing location, plant variety and the method of processing.

The benefits of olive oil consumption have been linked to its high content of monounsaturated fatty acids and its antioxidant content. Antioxidants can neutralise 'free radicals' in the body that may oxidise lipids (fats), DNA, and proteins promoting cancer and heart disease. The EUROLIVE project was a European multi-centre clinical nutritional trial that investigated the effect of a traditional, antioxidant-rich ingredient of the Mediterranean diet on oxidative stress and damage to lipids and DNA in humans. Oxidative stress occurs in humans after meals containing fat. The potential for the beneficial effect of olive oil and that of its phenolic compounds on this so-called "postprandial" oxidative stress were specifically examined.

More phenols are better?

The project studied the bioavailability and the binding of olive-oil-derived phenolic compounds to low-density lipoproteins (LDL). LDL is also known as "bad cholesterol" as it correlates highly as a risk factor for conditions such as heart disease. The study focused on whether a reasonable supplement of refined (with little or no phenolics), normal (with moderate phenolic content) and extra virgin (with a high phenolic content) olive oil would reduce oxidative degeneration of lipids and DNA in human subjects. An initial bioavailability and short-term study was conducted with 12 volunteers before the multi-centre, randomised clinical trial was initiated. The clinical trial was conducted on 200 healthy male volunteer (of whom 182 completed the study) aged between 20 and 60 from three different European populations (northern – Denmark and Finland, central – Germany, and southern – Spain and Italy). Effects were determined in relation to the phenolic concentration of the olive oil consumed.



The trial lasted for three weeks, after a two-week "washout" stage when the volunteers avoided olive oil and olives intake. During all the trial volunteers avoided an excess in the intake of antioxidants. The amount of olive oil given to volunteers during the trial represented 'real life' volumes, lower than or equal to those present in a typical Mediterranean diet. Blood and urine samples

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were analysed for the presence of phenolic compounds. Olive-oil-derived phenolic compounds have been shown to be potent antioxidants in the laboratory but prior evidence for this effect in vivo was not so clear.

The study required a number of new chemical analytical procedures to be developed in order to initially identify and quantify the various components in the olive oils used and the biological samples obtained. Other techniques include advanced biotechnological assays.

Antioxidant protection

The EUROLIVE study showed a clear relationship between the quantity of two phenolic compounds of olive oil (tyrosol and hydroxytyrosol) absorbed by the body and the phenolic content of the olive oil administered. The total amount of phenolic compounds found in LDL in postprandial tests also increased in direct proportion to the olive oil phenolic content, and blood plasma concentrations of tyrosol and related compounds correlated with this. The degree of LDL oxidation in postprandial stress was lower as the phenolic content of the olive oil administered increased.

The results showed that sustained consumption of all types of olive oil increased high-density lipoproteins (HDL or so-called "good cholesterol"), the total/HDL cholesterol ratio, and antioxidant cellular defences, and reduced DNA oxidation amongst other positive health indicators. Consumption of olive oils with medium to high levels of phenolic content reduced the LDL/HDL cholesterol ratio and the amount of oxidised LDL and other oxidative biomarkers present in the body. The oil with highest phenolic content showed the greatest effects on increased HDL cholesterol and reduced lipid oxidative damage. There were no changes seen in antioxidant enzymes or vitamin levels.

Cost-benefit relationship

All types of olive oil can improve the human body's blood lipid profile, antioxidant defences and help

protect its DNA from oxidative attack. The higher the phenolic content of the olive oil, the greater the health benefits.

As the market price of olive oil differs considerably, with refined and common olive oil (lower phenolic content) being cheaper than extra virgin olive oil (high phenolic content), there is a clear cost-benefit ratio here. However, the important public health message is that any olive oil can provide some protection. This message is being spread via various routes from scientific papers to brochures for European consumers and should form an important input for future European public health policies.

More information

Project website: <http://www.kepka.org/eurolive/>
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Project Essentials

Full Project name:

The effect of olive oil consumption on oxidative damage in European populations

Project Acronym: EUROLIVE

Project type: Shared Cost Project – FP5

Theme: Quality of Life

Contract No.: QLK1-2001-00287

Project Start Date: 01/01/2002

Duration: 36 months

Total Budget: € 2 671 988

EC Contribution: € 1 895 661

Project Collaborators:

Municipal Institute for Medical Studies Barcelona (ES), Roghospitale of Copenhagen, University Hospital (DK), University of Kuopio (FI) University of Bologna (IT), German Institute for Nutrition (DE), University of Berlin (DE), University of Barcelona (ES), OY Jurilab (FI), Consumers Protection Centre (EL)



A tonic for heart disease

(IMMIDIET)

What is the impact of different dietary habits on the risk profile for heart disease? The FP5 project IMMIDIET looked at three European communities with different risk rating for heart attack and assessed the influence of both dietary and genetic factors. Communities in Italy, Belgium and the UK were assessed using a network of local doctors. A wealth of data was collected including medical samples that have been stored in a biobank. The results have contradicted several common beliefs and should have a strong impact on national and European public health policies.

Genes or environment?

The factors that contribute to an individual's risk factor with respect to heart disease, such as myocardial infarction (a heart attack), are a combination of both dietary and genetic components. The risk can be assessed by measurement of medical parameters such as the level of coagulation factor VII (FVII) in the blood and through medical diagnostic evaluation of the so-called "metabolic syndrome" of cardiovascular risk which includes high blood pressure and abdominal fat accumulation.

By assessing differences in dietary pattern among three European populations with different risk profiles for heart disease, IMMIDIET looked to study changes attributable to migration and evaluate the possible impact of changing lifestyle on specific indicators of risk, in relation to individuals' genetic background. This could allow identification of sub-groups of subjects exposed to specific environmental or genetic situations that could benefit from a change in diet.

Migration model

The study involved 270 couples each from Belgium, Italy and the UK that were age- and sex-matched. In addition, to model the interaction between nutrition

and genetics a further 270 age- and sex-matched couples from Belgium, but of mixed Belgian and Italian origin, were recruited. This allowed the environmental effects of migration from Italy to Belgium to be assessed. Changes in dietary habits and biomarkers of food intake for mixed-nationality couples as compared with those of the original population were assessed and the effects of such changes on specific heart disease risk factors analysed.

A new multi-language food frequency questionnaire (FFQ) was developed for the study and used to evaluate dietary factors. It was analysed with an adapted programme using integrated food composition tables. A network of local and international General Practitioner (GP) doctors was set up to collect data on diet and health from the couples and act as a conduit for communications and information.



Southern advantage disappearing?

The study found that the "North-South" gradient of risk for cardiovascular disease is disappearing. The UK, previously the country at highest risk, has improved, at least in some of its regions. The data demonstrates that by changing lifestyle, such as eating or smoking habits, physical activity, etc., it is possible to stop and even reverse trends in the risk of cardiovascular disease. The study highlighted a worrying trend for blood pressure and sodium excretion. There is a clear trend towards increasing blood

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pressure in the populations from Italy to England and Belgium. This trend is more evident amongst women but also present in men. In addition, there is clear trend for urinary sodium excretion (a biomarker of salt intake) to increase from Italy to England and Belgium. This suggests a positive association between the higher level of blood pressure in Italians and a high salt intake with the diet. These factors may be significant contributors to an observed increased risk of stroke in Italy.

Contrary to expectations, the study found that differences in dietary intake among the groups were not large. This could be interpreted as a trend towards homogenisation of the European populations in terms of nutrition. However, this may not be good news for Italians who seem to be losing their "Mediterranean diet" protection and acquiring detrimental life habits: high tobacco consumption, low levels of physical activity, high salt intake. The study clearly assigns a weaker role to genetics in determining the risk of population: the role of environment being the principal factor in determining risk. The effect of migration and integration were seen as positive from the health point of view. Mixed couples had a better risk profile: they smoked less, drank less, had a good level of physical activity and maintained the good food habits of both their cultures.

The project created an anonymous database containing information on 2 050 subjects from across Europe and is available for further studies. In parallel, a Biological Bank of DNA, plasma, serum and urine samples from the subjects was established and is also available for further research by members of the IMMIDIET consortium and other scientists on request.

Health messages

The results of the IMMIDIET project should have a significant impact on European health policies. Several publicity campaigns against high salt intake have been conducted in England in the past 20 years with the result - clearly shown in the project - of lowering salt intake and consequently reducing blood pressure. Similar action would be

beneficial in Italy and Belgium on the basis of the IMMIDIET findings.

The project targeted information on European GPs and agri-food companies with wide dissemination of results to a specialised public through scientific papers and presentations, articles and conferences, as well as booklets produced for the general public. It also put together educational support for health-care providers and material for promoting healthy diets for the prevention of heart disease.

More information

Project website: http://www.moli-sani.org/it/immidiet_site/welcome.html

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Project Essentials

Full Project name:

Dietary habits profile in European Communities with different risk of myocardial infarction: the Impact of migration as a model of gene/ environment interaction

Project Acronym: IMMIDIET

Project type: Shared Cost Project

Theme: Quality of Life – FP5

Contract No.: QLK1-2000-00100

Project Start Date: 01/01/2001

Duration: 36 months

Total Budget: € 2 280 625

EC Contribution: € 1 587 543

Project Collaborators:

Catholic University of Campobasso (IT), Catholic University of Leuven (BE), Italian National Research Council – Institute of Food Science (IT), National Institute for the Study and Cure of Tumours (IT), Maastricht University (NL), Warwick Medical School (UK), University Joseph Fourier de Grenoble (FR)



Wiping out listeria in the dairy

(LMTOOCHE)

Listeriosis is a dangerous food-borne disease that can be fatal for humans. Infection occurs mainly through eating contaminated food like meat, meat products, vegetables, raw milk and dairy products. The bacterium that causes the disease, *Listeria monocytogenes*, is able to form biofilms that are very resistant to cleaning. The LMTOOCHE project has characterised the bacterium and sought strategies to improve cleaning and disinfection of *Listeria monocytogenes* in the artisanal dairy environment. A set of recommendations has been produced and widely publicised.

Listeria persistent and deadly

Listeria monocytogenes is the bacterium that causes the disease listeriosis. In its most severe form, listeriosis has a high mortality rate in humans, especially among people in vulnerable categories for example the elderly and the immunocompromised. *L. monocytogenes* is distinct in its ability to form a biofilm which resists normal cleaning procedures. The bacterium is also able to adapt itself to its environment further enhancing its persistence. These factors are very important in the dairy sector, particularly when traditional procedures are being followed.

The LMTOOCHE project was undertaken in response to the need to control the presence of *L. monocytogenes* in the cheese-making dairy. To be better equipped to do this, a fuller understanding is needed of the mechanisms and trends the bacterium adopts when colonising surfaces.

Understanding biofilm characteristics

The project sought to test the hypothesis that the persistence of *L. monocytogenes* in the cheese-making environment can be correlated with its capacity for adaptation to acid and salt and its ability to form biofilm and resist disinfection. Singling out the proteins involved in these physiological responses should allow identification of the corresponding genes in *L. monocytogenes* and the data used to formulate

advice on control procedures for *L. monocytogenes* in the dairy. The research aimed to provide tools that will predict the presence of strains of *L. monocytogenes* with a high capacity to form biofilm in the dairy that are therefore likely to become endemic. Finally, the intention was to provide evidence for which strain characteristics might be open to blockade as a strategy to remove or prevent biofilm.



The LMTOOCHE project was carried out in five partner laboratories and in close cooperation with traditional cheese-making dairies in Portugal and Spain. The project focused on cheese traditionally made from raw cow's and ewe's milk, but cheeses made from pasteurised milk were also studied. The work was divided into three parts. Firstly, how the physiological status of *L. monocytogenes* or the physical or microbiological status of the dairy or cheese correlates with its ability to form biofilms and its sensitivity to disinfection was investigated. Then, *L. monocytogenes* samples isolated from the dairies and the composition of the cheeses were determined and the effect of acid or salt adaptation on biofilm formation and disinfection resistance was studied. Listerial colonisation of different surfaces in the dairies and how the different surfaces and hydrodynamic flow interact with pH, salt and disinfectant concentration to determine listerial biofilm formation was assessed and the molecular characteristics of *L. monocytogenes* required for acid or salt adaptation and biofilm formation correlated with these abilities.

Listeria database, new cleaning regimes

The project has made extensive sampling of artisanal dairies and cheeses from selected artisanal cheese-

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making dairies throughout the production cycle for cheeses made with ewe's and cow's milk. Analysis of these samples has led to the compilation of a large database of the characteristics of listerial isolates. For all isolates, genetic fingerprinting, virulence gene profiles and serotype (surface proteins or antigens) data have been included. In particular, the genes that are involved in listerial biofilm formation have been identified. In addition, the influence on biofilm formation due to listerial adaptation to low pH or high salt concentration has been determined. Similarly, the influence of pH and salt on the listerial resistance to disinfection was evaluated by the research team.

The strains of *L. monocytogenes* can be divided into two groups on the basis of their biofilm's resistance to shear stress and corresponding to their isolation from sites subject to 'static' or 'flow' conditions. The project has come up with a new procedure to assess the impact of cleaning regimes on listerial attachment to surfaces and HACCP analysis undertaken to identify the Critical Control Points within the dairy and cheese-making environment. The project findings were discussed in a workshop at the Instituto de Ciência Aplicada e Tecnologia in Lisbon, Portugal, in February 2006. Analysis of the data obtained during the project is on-going and further revelations concerning the biology of listeria is expected when this is completed.

Recommendations for safer cheese-making

A series of recommendations on controlling *L. monocytogenes* in artisanal cheese-making dairies have been produced by the project partners and a dedicated website established. For dairy owners and managers, the emphasis is on improving the safety of their product via a proactive approach to food safety and a good hygiene ethos. Temperature monitoring of raw milk is important and so is cleaning and disinfecting the whole dairy site, not least the working rooms and milk reception area. Dairy-specific disinfectants will be effective in killing off listeria if used according to the manufacturers' guidelines and special care needs to be taken when cleaning and disinfecting plastics.

The HACCP analysis identified five main critical control points: the raw milk, handling of cheeses by staff, temperature monitoring during maturation of cheeses, washing of cheeses (where this is done) and the use of the appropriate quality of salt. The project suggest that the strongest possible action must be taken following the isolation of any *L. monocytogenes* species because all *L. monocytogenes* isolates from dairies are equally adept at colonising surfaces and no test for problematic strains currently exists.

Application of the recommendations should ensure that listeriosis episodes due to contaminated artisanal cheese production are reduced across Europe.

More information

Project website:

<http://www.le.ac.uk/ii/eu/lmtooche>

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Project Essentials

Full Project name:

Characterisation of *Listeria monocytogenes* to provide tools to predict biofilm formation during cheese-making

Project Acronym: LMTOOCHE

Project type: Shared Cost Project – FP5

Theme: Quality of Life

Contract No.: QLRT-2001-02219

Project Start Date: 01/01/2003

Duration: 38 Months

Total Budget: €1,435,661

EC Contribution: €1,089,646

Project Collaborators:

University of Leicester (UK), National Institute for Engineering, Technology and Innovation (PT), Institute of Applied Science and Technology (PT), Loughborough University (UK), University of the Algarve (PT)



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Local food for better health

(LOCAL FOOD-NUTRACEUTICALS)

Numerous studies indicate the beneficial effects of certain elements of Mediterranean diets. Very little is known, however, about the role of local food products, for example, regional vegetables and varieties of fruit. This EU-funded project investigated the role of such resources in the local diets of selected regions in south-eastern Spain, southern Italy, and on the Greek island of Crete. Over 150 plant species were investigated for antioxidant activity, the presence of which in food may contribute to reduced risk of cancer and heart disease, and other health properties using a variety of *in vitro* assays. The results can provide economic opportunities for local rural communities and support new product innovation in the European health food industry.

A neglected resource

In Mediterranean countries, the consumption of fruit and vegetables is considerably higher than in most European countries and the United States, and has been termed the Mediterranean diet(s). The study of the Mediterranean diets has also led to an in-depth understanding of biochemical mechanisms associated with certain groups of natural products like flavonoids, coumarins, certain fatty acids and other chemicals as well as a more informed phytochemical analysis of such products.



However, until the start of this project very little was known about the current role of local food products (for example, regional vegetables and staples) that are consumed on a less regular basis and their contribution to a healthy and sustainable diet. These local foods are 'neglected' European resources. Much of the knowledge of these plants is held by older members of the local population and it is important that it is not lost to future generations. Consumer trust in the food supply chain may be enhanced by a rational scientific approach to the development of new products which are considered healthy and based on regional European traditions.

Preserving local knowledge, extending the science

The LOCAL FOOD-NUTRACEUTICALS consortium undertook a fuller evaluation and development of the Mediterranean diet (including selected local variants of this diet) focusing on local dietary plants (including fungi) and plant-derived products. The project studied extracts of plants traditionally used in rural communities of southern Italy, Crete (Greece) and southern Spain as dietary by-products with potential anti-oxidant, anti-diabetic and memory-mediating activity. The research approach adopted for the project combined classical ethnobotanical methods with modern molecular biology and pharmacology techniques and has improved the understanding of the mechanisms underlying the link between diet and chronic disease, especially those that are age-related. Analysis of this local knowledge can contribute to the development of new food supplements.

A knowledge base was created for the dietary products commonly used in selected communities of the Mediterranean area as health-promoting agents, and their impact in preventing ageing-related illnesses assessed. A detailed nutritional-social understanding of the current regional importance of

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these local food supplements, their socio-economic potential and the improvement of local economics was gained.

Antioxidant protection, new nutraceuticals

The project looked at more than 150 species of food plants in a variety of primary *in vitro* assays (including assays related to memory formation, diabetes type II, antioxidant activity and other health biomarkers). Neuro-pharmacological and cardiovascular activities of selected food plant extracts and isolated natural products were evaluated and the molecular mechanisms mediating the effects of highly active extract species investigated in a variety of *in vitro* and *in vivo* cardiovascular models, including mechanisms affecting endothelial cell (the cells that line blood vessels) function with age.

Many of the plant extracts derived from the collected plants were shown to be very effective antioxidants and can protect lymphocytes (a cell of the immune system) against oxidative stress. This shows the importance of certain extracts (known as polyphenols and flavonoids) in providing protective effects. The consortium is moving to develop pharmaceuticals from the selected plants with a proven effect on ageing-population-related illnesses, which can be a base for new nutraceuticals across the European market.

The project consortium has disseminated its results at local, European and international level. In addition, it offers a mechanism allowing the local communities giving the traditional knowledge to the project to receive adequate benefits in cases where successful nutraceutical supplements are developed and marketed from the study.

Opportunities both locally and at the European level

The LOCAL FOOD-NUTRACEUTICALS project has contributed to European policy at several levels. Its findings are expected to boost the competitiveness of the EU health food and functional foods

industry by providing the opportunity to develop new high-quality health supplements with novel properties.

The project will facilitate the continued use of such plant products by local communities and give a renewed appreciation of their importance to these populations and opportunities for new economic activity. This can help to address the local needs of rural communities which are facing difficult challenges due to ecological, economical and social problems. Last but not least, the proposed project may help in strengthening the consumers' confidence in food produced in the EU.

More information

Project website: <http://www.biozentrum.uni-frankfurt.de/Pharmakologie/EU-Web/index.html>

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Project Essentials

Full Project name:

Local Mediterranean food plants: Potential new nutraceuticals and current role in the Mediterranean diet

Project Acronym: LOCAL FOOD - NUTRACEUTICALS

Project type: Shared Cost Project – FP5

Theme: Quality of Life

Contract No.: QLK1-CT-2001-00173

Project Start Date: 01/01/2002

Duration: 36 months

Total Budget: € 1 733 920

EC Contribution: € 1 579 120

Project Collaborators:

School of Pharmacy, University of London (UK), University of Murcia (ES), Harokopio University (EL), University of Frankfurt (DE), University of Milan (IT), Hoffman-La Roche Ltd /DSM (CH)



How microbes can protect cheese

(SCM)

The surfaces of red smear-ripened cheeses are home to complex microbial communities that are an essential part of the ripening process. However, there is a potential for growth of harmful bacteria, in particular *Listeria monocytogenes*, in these communities, which has important health implications for consumers. The SCM project aimed to better understand the surface ecology of these popular traditional cheeses in order to consider strategies for reducing listerial contamination without compromising the sensory qualities that are so well appreciated by many European cheese eaters.

A complex surface

Around 165 000 tonnes of red smear-ripened cheeses are produced in Europe every year, mostly in Austria, France and Germany. Many of them are PDO-labelled (Protected Denomination of Origin) and examples include Limburger, Livarot (an Appellation d'Origine Contrôlée cheese from Normandy), Reblochon, the Tilsit family of cheeses from the Baltic coast, and Gubbeen – a farmhouse cheese made in south-west Ireland. These types of cheese are an important part of European dairy production and are characterised by the development of complex microbiological communities (or consortia) on the cheese surface early in the ripening process. The smear cheeses are ripened at relatively high temperature (around 14°C) and high relative humidity that promote microbial growth on the surface layer. It is these microbial consortia, composed of a variety of yeast and bacteria that give the cheese its distinctive red, glistening colour.

Little is known about the actual microbial ecology of the surface flora, but initial growth of yeast results in an increase in the pH of the surface layer of the cheese, which, in turn, allows growth of spoilage and pathogenic bacteria, particularly *Listeria monocytogenes*, to occur. Such cheeses support growth of listeria and have been named in cases of listeriosis.

A fuller understanding of the microbiological populations and processes taking place on these cheeses is therefore important to limit any risk to consumers without compromising the quality characteristics of these traditional dairy products.



Identifying the species, preserving taste

Some strains of *Brevibacteria* from the surface of smear cheese have been shown to produce toxins that are active against other bacteria such as listeria and result in moderate reduction in *Listeria monocytogenes* population. It is possible that the yeast microflora growing on the surface also inhibit listeria, although this had not been studied. Therefore, the SCM project's main aim was to characterise the surface microflora (both yeast and bacteria) for Limburger, Reblochon, Livarot, Tilsit and Gubbeen cheese using chemotaxonomic and molecular methods. These techniques will determine if the microflora on the cheese are the same or different between the cheese types and any new species of yeast and bacteria identified would then be described.

Samples were taken from several batches of the five cheeses, from different production dairies and at three or four different stages during the ripening process for each type. A polyphasic approach was used to identify the bacteria and Fourier-Transform Infrared Spectroscopy to identify the yeast species. Strains of yeast with anti-listerial activity and which do not inhibit the growth of other bacteria in the smear were identified and their ability to control

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growth of listeria in commercially-made cheeses demonstrated. The project also aimed to identify the listeria inhibitor produced by the yeast.

Microbial diversity

Samples from the five cheese types yielded 2 564 bacteria isolates, 2 294 of which were identified, and 2 441 yeasts, 2 390 of which could be identified. Twenty-eight genera (a taxonomic family of species) of bacteria were pinpointed, 13 of which were Gram-positive and 15 Gram-negative – Gram-positive and -negative refer to differences in bacterial cell wall structure. The dominant genera were *Artrobacter*, *Brevibacterium*, *Cornebacterium* and *Staphylococcus*, all of which are Gram-positive. However, only the members of first two genera were found in all cheese samples. Four new taxa of bacteria were identified in samples from Livarot, Tilsit and Gubbeen cheeses. The yeast species comprised 13 different genera.

Denaturing Gradient Gel Electrophoresis (DGGE) analysis was carried out on all the cheeses. This technique is a genetic fingerprinting technique used to separate individual sequences from complex mixtures and showed different patterns for each of the five cheeses and also differences within cheese types made at different locations (Reblochon, Livarot, Tilsit) and even within samples made at the same plant (Gubbeen). The only cheese showing any degree of consistency was the Limburger.

A model microbial system was investigated, made with an association of 82 strains that were chosen to be representative of the Livarot cheese. By using sensory (odour-similarity) assessments, it was possible to select a simplified ecosystem composed of six bacteria and four yeasts. The impact of this model ecosystem on the microbial diversity was assessed before and after growth. This simplified model was then further tested to understand the individual contribution of each strain to the compositional and sensory perceptions of the cheese. This was done by omitting individual strains from the mixture and then analysing the organoleptic (principally smell) characteristics of the cheese. The dynamics of the microbial population and

enzymatic and biological analyses of the cheese were also made.

Safer cheese, same satisfaction

A much fuller understanding of the complex microbial communities that are fundamental to the red-smear cheeses' characteristics has been obtained. The use of model cheese cultures may help to remove or at least reduce the potential for harmful bacteria (in particular *Listera monocytogenes*) to contaminate the cheese. Since this can be done without affecting the characteristic sensory qualities of these traditional dairy products, the safety of red smear-ripened cheeses can be improved without disrupting the consumer's enjoyment of these unique European foods.

More information

Project website: <http://www.teagasc.ie/research/dprc/smearcheese.htm>

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Project Essentials

Full Project name:

Biodiversity and anti-listerial activity of surface microbial consortia from Limburger, Reblochon, Livarot, Tilsit and Gubbeen cheese [also known as Smear Cheese Microflora]

Project Acronym: SCM

Project type: Shared Cost Project – FP5

Theme: Quality of Life

Contract No.: QLK1-CT-2001-02228

Project Start Date: 01/09/2001

Duration: 36 months

Total Budget: € 2 290 595

EC Contribution: € 1 694 680

Project Collaborators:

Dairy Product Research Centre (IE), Bundesanstalt für Alpenländische (AT), University of Caen Basse-Normandie (FR), INRA (FR), University of Newcastle upon Tyne (UK), University of Ghent (BE), Technical University of Munich (DE), French Technical Institute for Cheese (FR), Syndicat des Fabricants de Pont L'Évêque et de Livarot (FR), Syndicat interprofessionnel du Reblochon (FR), Tirol Milch Reg. Gen.m.b.H (AT), J. Bauer KG (DE)



A taste of Europe

Quality olives for all!

(TDC-OLIVE)

Olives and olive oil are well known for their beneficial effects on human health as well as their nutritional and culinary properties. They are basic elements in the local diet of the Mediterranean region, which hosts the main producers and boasts the highest olive consumption in the world. The TDC-OLIVE Specific Support Action coordinated a number of initiatives to improve technology in the olive oil industry. The main focus was on small and medium-sized enterprises (SMEs) and socio-economic, quality and environmental aspects. The findings aim to boost the quality and quantity of olive production and raise consumption throughout Europe and beyond.

Olives: healthy and nutritious



Table olives and olive oil are well known for their beneficial effects in human health, which includes protective effects for the skin and the cardiovascular and skeletal systems. The underlying idea of TDC-OLIVE was that this source of healthy food should not be restricted to the Mediterranean region. In fact, it is highly recommended that table olives and olive oil should be part of the regular diet not only in European countries, but also worldwide. To attack the roots of the problem, producer companies need to be strengthened since the majority of them in the main olive-growing areas of Spain, Greece,

Italy and Portugal are SMEs - usually traditional, family-run firms.

A particular concern is the process of controlling olive oil quality. This is considered a high priority and includes the need to improve the treatment, recycling and re-use of all the waste and by-products generated in the process of producing olive oil and olives.

Networks, training, promotion

The project had three main activities. A European network of Technology Dissemination Centres (TDCs) for SMEs in the olive/olive oil sector was set up. In parallel, activities to promote olive oil and table olive consumption in non-Mediterranean European countries were undertaken and a training programme for table olive growers and companies involved in milling olives for oil production launched. This focused on improving technical competence and competitiveness.

The TDC network is both a physical and virtual network to support businesses in this sector and also act as a bridge between them and research institutions. Since Mediterranean olive oil and table olive producers (particularly SMEs) need to modernise and sharpen their competitive edge, the TDCs aim to speed up the necessary technology innovation process of SMEs by establishing a training programme and by providing updated information on topics of interest. Simultaneously, TDCs carried out a series of actions and promotional activities to improve the image of olives in the eyes of central and northern European consumers. This included a survey and report on differing consumer attitudes towards, and knowledge of, olives across Europe.

An olive encyclopaedia

Early in the project, TDC-OLIVE carried out a survey among the SMEs in the sector to establish their general needs and, specifically, their training requirements. The results of this determined the training

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programme, which covered five areas: Information and Communication Technologies, Food Quality, Environmental Issues and EU legislation, Regulations related to the olive products industry, and promotional activities. More than 500 olive-oil related professionals attended the courses and a further 380 followed them on-line.

Four TDCs were established in Germany, Greece, Italy and Spain. They provided the on-line courses to facilitate access to SMEs and business associations unable to participate in the training programmes and gave free support to SMEs in the table olive and olive oil sector. The TDCs act as a bridge linking SMEs with the academic and research community and as focal points for the circulation of a wide range of regional and international information on innovation, access to funding and subsidies, relevant research, legislation, exhibitions and more.

The network also disseminates knowledge about olive oil to countries with low olive consumption. This included an "olive encyclopaedia" of 15 booklets aimed at businesses, consumers and scientists. In addition, articles were published in technical journals along with material for the more popular publications. Olive promotions were held at food exhibitions and surveys carried out on participants' attitudes to consuming olive oil, thereby helping to frame market initiatives.

A lasting impact on competitiveness and health

TDC-OLIVE action has worked to develop a 'model' modern SME for the olive industry with qualified staff using new technologies to access information and all the relevant technological innovation systems. This type of SME is concerned with product quality optimisation, and is seriously committed to the treatment, recycling and re-use of all waste products generated during its activities.

Small firms like this will be capable of producing and selling a high-quality product to a global marketplace in a sustainable manner. This will bring economic and environmental benefits to their local

regions and help boost consumption of olive oil and table olives across Europe and beyond, with all the wider health benefits that will bring.

The network of TDCs has involved business associations and other organisations within the sector in its activities in order to establish a credible network that can continue supporting SMEs in the long term.

More information

Project website: <http://www.tdcolive.net>

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Project Essentials

Full Project name: Setting up a network of Technology Dissemination Centres to optimise SMEs in the olive and olive oil sector.

Project Acronym: TDC-Olive

Project type: SSA

Theme: Food Quality and Safety

Contract No.: CT-2004-505524

Project Start Date: 01/02/2004

Duration: 24 months

Total Budget: € 789 474

EC Contribution: € 789 474

Project Collaborators:

Spanish Council for Scientific Research (ES), The Madrid Institute for Research on Rural Development, Agriculture and Food (ES), Experimental Institute for Olive Technology (IT), Institute of Technology of Agricultural Products (EL), Technology Transfer Centre, Bremerhaven (DE), Federal Research Centre for Nutrition and Food (DE), Unilever (NL), Agricultural Association of Professional Framers (ES), Sabina-Agricola (IT) Alcubilla 2000 S.L. (ES), Improtechnology Limited (UK), Biozoon GmbH (DE), Agricultural Association Agio Apostolon Vion (EL)



A taste of Europe

Keeping real food on track

(TRACE)

The TRACE Integrated Project aims to help European citizens track the origin of the food they are eating. It hopes to give consumers added confidence in the authenticity of European food products through a complete traceability system that covers the entire 'farm to fork' food chain. TRACE will also assess European consumer perceptions, attitudes, and expectations regarding food production systems and their ability to trace where the food on their plate comes from, together with consumer attitudes to designated-origin products, food authenticity and even fraud. Technology transfer activities will train industry, regulatory bodies and analysts in the new systems and methods.

Food fraud, consumer confidence

Consumers increasingly want to have confidence in labels on the food they buy and, in particular, to be certain where their food comes from. Producers of regional specialities like Parma ham also want to be sure that imitators cannot make false claims of origin. Currently, there is no coherent Europe-wide infrastructure for tracing food to directly prove its origin. Rapid developments in logistics are being made in isolation from the analytical methods that can verify a food's authenticity.

To date, new scientific techniques that could provide methods for confirming where food has come from remain largely unexploited. TRACE will employ the latest methods and traceability systems in a long-term integrated programme, involving more than 50 institutions and organisations, to provide a thorough track of a range of foods from the original farm source to the shop shelf and back again.

Food fingerprints help traceability

Most foods contain fingerprints of the environment where they were produced. The isotopic ratios of heavy elements from the soil or lighter elements from plant materials depend very much on regional geo-

logical and climatic patterns. Therefore, one of the approaches being studied by TRACE is the correlation of regional geochemical and bio-climatic factors with the properties of locally-produced foods. This mapping of local characteristics will reduce the need for a different set of data for each commodity, making tracing faster and cheaper.



Another area is the use of advanced molecular biology technology that can rapidly identify species, races or breeds of animal or varieties of plants. Genetic markers and microarray technology will broaden these techniques and further speed them up. Recent advances in metabolite profiling methods will also be pursued to produce generic techniques for verifying food. Statistical techniques will be used to produce specifications that can be easily incorporated into supply chain management systems, providing a cost-effective mechanism to monitor product integrity.

A study will be conducted on consumer attitudes towards traceability and food fraud. In particular, this will address the potentially contentious issue of "What information do consumers think they should be able to access from a traceability system?" Further input will be provided by a network of consumer groups throughout Europe.

New methods give good traceability

TRACE aims to develop generic and sector-specific traceability systems for use in the food industry. These

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systems will include origin-related specifications that can be checked using methodology also developed in the project. Good traceability guides will be produced and global traceability language and architecture will be tested in five important food sectors: meat, chicken, cereals, honey and mineral water.

The project will focus on products which are marketed on the basis of where or how they are produced, but will have wider applicability to other commodities. Technology transfer will be assured through dissemination activities, workshops and intensive training so that the methods and systems can be widely adopted.

A Good Traceability Practice guide for food production systems will be compiled. In addition, a programme of demonstration activities in the food industry will critically appraise the traceability systems developed under TRACE to ensure they are cost-effective and fit for purpose. This will ensure that the project delivers an integrated traceability system that is capable of enhancing consumer confidence in the authenticity of a wide range of foods.

Authentic, safe foods

The successful completion of TRACE will bring benefits for many sectors of the European community. It will benefit consumers by tracing the origin and ensuring the safety of the food they buy. Fraudulent or unsafe products will be quickly traced and taken off the market, reducing the considerable costs of fraud to society and business.

This transparency could considerably enhance the reputation of European food and result in it being perceived of superior quality, since its basic characteristics can be easily checked. Greater consumer confidence in their food will be of benefit to the European food industry and will also help promote sustainable and organic farming. It will protect markets in Europe and help boost sales to the rest of the world.

More information

Project website: <http://www.trace.eu.org>
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Project Essentials

Full Project name:

Tracing the origin of food [also known as Tracing Food Commodities in Europe]

Project Acronym: TRACE

Project type: Integrated Project

Theme: FP6 Food Quality and Safety

Contract No.: CT-2005-006942

Project Start Date: 01//01/2005

Duration: 60 months

Total Budget: [€ xxxx]

EC Contribution: € 11 960 000

Project Collaborators:

Central Science Laboratory (UK), Eurofins Scientific Analytics (FR), Joint Research Centre (EC), Federal Institute for Risk Assessment (DE), National Institute for Agricultural Research (FR), Bavarian Health and Food Safety Authority (DE), Austrian Research Centre, Seibersdorf (AT), EKPIZO (EL), Institute of Food Research (UK), Walloon Agricultural Research Centre (BE), Agricultural University of Athens (EL), Free University of Brussels (BE), RIKILT Institute of Food Safety (NL), Institute of Chemical Technology Prague (CZ), Agricultural Institute of San Michele all'Adige (IT), Bavarian State Collection for Palaeontology and Geology (DE), Institute of Chemical Methodologies – CNR (IT), National Institute of Chemistry (SL), National University of Ireland (IE), TEAGASC - The National Food Centre (IE), The Norwegian Institute of Fisheries and Aquaculture (NO), University of Utrecht (NL), Isolab GmbH (DE), University of Silesia (PL), Hydroisotop GmbH (DE), Maritech (IS), Catholic University of S. Cuore (IT), University Rovira I Virgili (ES), Institute of Quality Standards and Testing Technology for Agricultural Products (CN), Radboud University Nijmegen (NL), University of Genova (IT), Trace-Tracker Innovation A/S (NO), SINTEF Fisheries and Aquaculture Ltd (NO), Biolyfix AG (CH), Geochem Research BV (NL), Kenneth Pye Associates (UK), WPA Beratende Ingenieure GmbH (AT), Geschäftsstelle BATS (CH), National School for Agricultural Engineers, Clermont-Ferrand (FR), e-Blana Enterprise Group (IE), Qiagen GmbH (DE), Wageningen Agricultural University (NL), Polytechnic University of Madrid (ES), Helenic Research House (EL), Famille Michaud Apiculteur (FR), Agua Insalus (ES), University of Parma (IT)



Keeping sausages safe and traditional

(TRADISAUSAGE)

Food safety and quality are among the prime concerns of consumers. Recent health scares, such as BSE, have undermined many peoples confidence in industrial meat processing systems. Many meat eaters are turning to “traditional” products, like dry sausages. While there are some small-scale producers ready to meet this new demand, many face technical difficulties in complying with official food safety regulations. So, it is crucial to give traditional producers the means to make safe and economic products, as this will help to ensure the survival of valuable local food industries. This project evaluated the safety chain for traditional sausages from the producer to the consumer. New solutions were proposed to improve safety via directed microbial ecology strategies combined with HACCP (Hazard Analysis and Critical Control Point) principles. A guide of good hygienic practices for producers was published along with recommendations for European consumers.

Helping the small, traditional producer

The BSE crisis and a recent spate of food scares, like *Salmonella*, *E-coli* and *Listeria* poisoning and cases of dioxin contamination of animal feed, alongside the rumbling dispute over genetically-engineered food, have undermined public confidence in intensive farming and industrial food production systems. Increasingly, consumers are turning to “traditional” products. Traditional products and/or organic food production systems, as well as responding to the requirements of sustainable farming, can be an important source of revenue for people working in rural areas that are not suited to intensive farming.

However, small-scale food producers experience technical and financial difficulties in complying with official food safety regulations. Hygiene standards, in particular, are generally defined for large processing plants and are not always easily compatible with smaller production units. This difficulty has

created acute problems, particularly in the countries of southern Europe. It is crucial, therefore, to give traditional producers the means to produce safe products, and comply with the regulations, as it is the only way to insure the survival of many local rural economies with positive effects on employment and environmental protection.

Increased knowledge

The TRADISAUSAGE project brought together ten partner organisations to evaluate and improve the safety of traditional dry sausages all along the supply chain from producers to the consumers while preserving the qualities that give them their ‘typicality’. Traditional sausage processing units in six countries (France, Italy, Portugal, Spain, Greece and Slovakia) were studied to assess the know-how and techniques adopted in each region, the links that existed between raw material producers and processors, the various disinfection procedures, and last but not least the characteristics and names of the product themselves. In addition the buyers and consumers of these traditional sausages were characterised and their habits for preserving and consuming the product studied. This has allowed a thorough identification of the potential hazards associated with traditional sausages and the critical control points (CCP) in the entire supply chain, including consumption.

The safety of the products and the hygiene of processing units have been assessed and an improvement of the hygiene was proposed by directed microbial ecology which is based on the introduction of targeted disinfecting procedures towards spoilage and pathogenic flora and development of indigenous starters. All the results have been used to produce a guide for good hygiene practice.

Diversity in production and consumption

315 traditional sausage processing units were assessed and both their operations and products can be described in one word: diverse. This word is also

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appropriate for their customers who were classified into three groups: rural consumers, married, 31-50 years old, with children; urban consumers, 31-50 years old; and young consumers, single, with no children. There were also three types of sausage-eaters: the *traditional style* consumer who bought sausages at the processing unit, stored them without packaging for more than one week and ate them as starter course (mainly French and Italian); the *modern style* consumer who bought sausages at the market, stored them vacuum packed etc. and ate them as an aperitif (mainly Portuguese and Spanish); and the *new style* 'concerned' consumer who bought sausages for preparing snacks and stored them in plastic in the fridge (mainly Greek or Slovak).

Better safety

The hazards considered in both the sausage processing unit and post-purchase were microbiological (*Staphylococcus aureus*, *Salmonella*, *Listeria monocytogenes*, *enterohemorrhagic Escherichia coli*) and chemical with biogenic amines of microbial origin (tyramine, histamine, putrescine and cadaverine). 54 of the units were surveyed for hygiene level using a HACCP-related questionnaire and environmental samples from the units assessed. Few of the workshops showed significant microbiological hazards. Consumer safety was evaluated by studying the microbial stability of the sausages and it was concluded that traditional sausages could be considered safe products, irrespective of the type of product manufactured and the consumer's habits of handling and storage.

A process to improve the hygiene quality of the products was developed by addition of indigenous starter cultures with or without natural antimicrobial agents that reduced levels of spoilage and/or pathogenic bacteria, biogenic amine content, lipid and cholesterol oxidation without altering the characteristics of the sausage product.

Safe sausage guides

A guide of good hygienic practices has been published (May 2006) to help small producers to better control sanitary risks and thus produce safer products. This guide focuses on traditional fermented sausages

and includes twelve recommendation sheets covering reception and storage of carcasses and other ingredients, preparation of the sausage mixture, fermentation, smoking, drying and maturing, packaging and sale amongst other issues such as personal hygiene, premises and equipment. The guide is being translated into the language of each of the six partner countries in the project. The recommendation sheets are easy to understand and apply for the small producers. The guide will be distributed and explained directly to the producers via country-specific workshops.

A brochure for consumers explains potential hazards concerned with European traditional fermented sausages and has an overall recommendation that they should be stored in a cold, dry place at home.

More information

Project website:

<http://www2.clermont.inra.fr/tradisausage/index.htm>

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Project Essentials

Full Project name: Assessment and improvement of safety of traditional dry sausages from producers to consumers

Project Acronym: TRADISAUSAGE

Project type: Shared Cost Project – FP5

Theme: Quality of Life

Contract No.: QLK1-2002-02240

Project Start Date: 01/01/2003

Duration: 36 months

Total Budget: € 1 993 998

EC Contribution: € 1 497 535

Project Collaborators:

INRA Theix (FR), National School for Agricultural Engineers, Clermont-Ferrand (FR), Institute for Agricultural Research and Technology (ES), University of Barcelona (ES), University of Parma (IT), University of Teramo (IT), University of Trás-os-Montes and Alto Douro (PT), School of Veterinary Medicine of Lisbon (PT), Agricultural University of Athens (EL), Institute of Animal Physiology Slovak Academy of Sciences (SL)



A taste of Europe

Innovative and safe traditional foods (TRUEFOOD)

The overall objective of the TRUEFOOD Integrated Project is to bring innovations to the traditional food industry. This sector includes not only protected and patented foods, but also other regional and national traditional specialities. The innovations will improve competitiveness in the sector through higher food quality and safety standards as demanded by consumers, but will ensure that the essential characteristics of these culturally-important foods are not sacrificed. The project will bring research and the industry closer and facilitate effective collaboration and technology transfer.

Global competition needs quality response

The EU food and drink industry is extremely fragmented and under pressure from cheap mass-produced food and rising imports from outside Europe due to globalisation of food markets. A response focused on “rationalisation” or “mass production” innovations is likely to have a negative impact on the quality characteristics that European consumers associate with traditional foods and appreciate so much. These include, in particular, sensory qualities and geographical origin.

While sensory quality, geographic origin and convenience are the main drivers for demand, consumer concerns about food safety can significantly reduce demand for traditional food products. Apart from food safety, other health-related food quality characteristics - such as high levels of antioxidants, vitamins, minerals and polyunsaturated fats or low levels of salt, sugar and other preservatives, as well as pesticide, toxin and antibiotic residues, - are increasingly demanded by consumers. A central goal of European and national government policy is therefore to enhance the competitiveness of the traditional food sector via improvements in safety and quality characteristics that can be translated into higher consumer demand. The TRUEFOOD Integrated Project focuses on supporting this strategy.

Providing appropriate innovation

The TRUEFOOD project follows a multi-disciplinary approach that reverses the usual thinking of traditional food engineering: rather than limiting safety, nutritional quality, production efficiency, or even reproducibility of traditional food production to be compatible with method and equipment constraints, TRUEFOOD will look to adapt the equipment, structure and process systems themselves in order to create locally the best conditions for a given desirable result.

Strategically speaking, TRUEFOOD is aimed at bridging a clear gap between the industrial sector and research and development organisations carrying out independent research that is largely not exploited by industry. TRUEFOOD will create new, efficient communication channels within the food sector at national and European levels to ensure this research is used appropriately by industry. This will be achieved by setting up and maintaining links between science and industry.

Improving safety and quality, preserving tradition

At the scientific level, the objective of TRUEFOOD is to develop innovations that will improve the safety and quality of food made in ‘traditional’ production systems, in line with consumer expectations. This will focus on the development of methods for integrating targeted modern technologies and methodologies into traditional food production, processing and all along the supply chain, including distribution, marketing and retailing.

Specific objectives include identifying quantitatively consumer perceptions, expectations and attitudes with respect to safety, quality characteristics of traditional foods and identifying the innovations that could be introduced into the traditional food industry. These innovations will cover areas such as food safety guarantees, especially with respect to microbiological and chemical hazards, and improvements in nutritional quality, whilst maintaining or further improving other quality characteristics (for example, sensory, environmental, ethical) that are recognised by the traditional food consumers. The project will also support the marketing and supply chain development of traditional food products.

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The project will put in place, through the SPES Food & Drink Industry National Federations, a structure of continuous training and dissemination and will form a team of technical-scientific mediators, whose role is to disseminate the project findings throughout the socio-economic layers of the European food and drink industry, especially targeting small and medium-sized enterprises involved in making traditional food. The technology transfer to the food and drink industry will include methods and protocols written in manufacturers' national language, appropriate training and awareness-raising campaigns, etc.

Sustaining our traditional foods

By targeting innovation towards the wide range of traditional commodities that constitutes a significant proportion of the food consumed in Europe, the project aims to sustain a sizeable section of the traditional food industry in Europe and give their consumers the products they want.

This approach will both preserve and expand consumer demand and production of traditional foods in Europe and help traditional food manufacture and processing conform to EU and national trading, food safety and quality regulations as well as trader/retailer specifications.

TRUEFOOD is coordinated by the Spread European Safety European Economic Interest Grouping (SPES EEIG) - a grouping of eleven national federations of the European food and drink industry helping promote and carry out research in the food sector at the European level.

More information

Project website: <http://www.truefood.eu>

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Project Essentials

Full Project name:

Traditional United Europe Food

Project Acronym: TRUEFOOD

Project type: Integrated Project

Theme: FP6 Food Quality and Safety

Contract No.: FOOD-CT-2006-016264

Project Start Date: 01/05/2006

Duration: 48 months

Total Budget: € 20 080 000

EC Contribution: € 15 500 000

Project partners:

Spread European Safety GEIE (an EEIG located in Italy and grouping 11 National Federations of the European Food & Drink Industry: FR, IT, BE, CZ, HU, DK, AT, ES, PT, TR and EL).

National Institute for Agricultural Research (FR), National agency for New Technologies, Energy and the Environment (IT), Matforsk (NO), Agricultural University of Athens (EL), University of Ghent (BE), Association of Food Research Centres (FR), National Institute for Research on Food and Nutrition (IT), Research Institute for Agriculture and Food Technology (ES), University of Warsaw (PL), Dairy Research Institute of Ioannina (EL), Technical University of Munich (DE), University of Prague (CZ), University of Perugia (IT), Superior School of Biotechnology (PT), Progetto Europa Regions S.r.l. (IT), Karadeniz Technical University (TR), Campden & Chorleywood Food Industry Development Institute (HU/UK), Agricultural Institute of Slovenia (SI), Technical Educational Institute of Ionian Islands (EL), University of Applied Sciences of Weihenstephan (DE), University of Milan (IT), ETAT S.A. (EL), Higher Institute of Health (IT), University of Ljubljana (SI), Confederation of the Food and Drink Industries of the EU (BE), National Interdisciplinary Centre for the Dairy Industry (FR), Agriconsulting S.p.A. (IT), Genus plc. (UK), Adour Bio Conseil (FR), Norwegian University of Life Sciences (NO), Research Institute of Plant Production Grassland and Mountain Agriculture Institute Banská Bystrica (SK)



Assessing our taste for typical foods

(TYPIC)

Typicality is part of the Designation of Origin concept developed in the EU and could be a route to regain consumers' trust. The TYPIC project used consumer science and marketing approaches to identify the essential characteristics of typical food products from the consumers' viewpoint, and to determine the factors that motivate their preference for these products. Objective qualities of typical products were assessed by sensory and chemical analysis and related to the consumers' perceived attributes, providing food for thought for strategies to promote typicality along the food chain. Such promotions should focus on guaranteed authenticity and offer excellent global opportunities for specialist European producers.

What is typical about 'typicality'?

The Designation of Origin (DO) system introduced by the EU covers labelling of products with Protected Designations of Origin (PDO), Protected Geographical Indications (PGI) and includes other foodstuffs designated as Traditional Specialities Guaranteed (TSG). The labelling guarantees some specific sensory qualities and implies specific properties which may help to reduce consumers' risk perception through clear traceability and authentication for the product. But what aspect of a food's 'typicality', such as its sensory attributes (not least taste!), place of origin and labelling, motivate consumer preferences? The TYPIC project sought to measure consumer demand for and acceptability of a range of typical food products. In particular, differences within and between EU countries were assessed and, from this, guidelines for the European food supply chain and quality policy could be developed to produce and authenticate typical food products according to suitable techniques and consumer expectations.

Analysing red wine and ham

The 'typical' foods selected for the project were red wine originating from Germany (principally

Dornfelder) and France (mainly Beaujolais), and dry-cured hams originating from Spain (mainly Teruel) and France (from a variety of regions but mainly Bayonne and Auvergne). All were selected on the basis of bearing PDO-PGI labels. Consumer preferences and acceptability for these DO products were measured using a panel of almost 6 900 people, but with a smaller number (620) involved in more intensive testing. In parallel, the products were analysed by a variety of physico-chemical methods to develop a method for 'typicality' assessment or authentication.

DO-labelled food products are most often characterised by specific traits arising from the raw materials and processing methods used. The physico-chemical analysis of the samples shows that typicality traits, appreciated by the consumer, fit with specific sensory profiles, resulting from the identified origin and local know-how. It means that European DO-labelling policy is objectively based and could be legitimised by means of physico-chemical characterisation of the relevant food products.



Consumer behaviour

Consumer purchasing behaviour with respect to DO-labelled food products seems linked first to familiarity with DO products or labels. The age of the

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respondents is also an important factor. Variety is another factor acting in favour of purchase of DO products, albeit at a lower level. Beyond the main preference for his/her own region of origin, a small but significant cluster of consumers is clearly open to purchasing "foreign" DO products in each country studied in TYPIC: France, Spain and Germany. These consumers can be seen as connoisseurs. They are willing to taste foreign DO food on the basis of their experience of liking food products coming from their own region. This consumer segment often experiences foreign typical foods during holiday and business trips.

Price is also an important but contradictory factor. Some consumers can be considered as price-sensitive, while others use price as a quality marker. This price disparity leads to a complex use of distribution channels according to brand category, for example, when looking for DO products, most respondents were more prone to go to speciality stores rather than a supermarket.

It appears that consumers are sensitive to marketing factors when purchasing DO products, while tasting responses for DO products do not always seem clearly positive. Whilst PDO-PGI producers, naturally, believe their products to be superior, consumers are more interested by the image of the region of origin, the brand notoriety, and are always subject to price effects. This gap highlights the need for producers to research and understand who their buyers are and what influences their behaviour.

Market opportunity for Europe?

The technology developed in the TYPIC project can be transferred easily to either cooperative societies or industries for rapid evaluation of basic sensory perceptions. The project's findings can help improve the authentication procedures stipulated by food policy authorities in Europe. The results will help the European Commission's understanding of typical food products consumption trends and throw more light on ways of harmonising the disparate regulation between Member States regarding DO labels and authenticity control of these products.

The findings of the project suggest that the European market and intra-Community trade could benefit from higher consumption of DO-labelled food, by reinforcing and integrating DO-labelling policy. Exports of DO-labelled produce could also be enhanced by efficient promotion and communication of the scheme. Such promotions should focus on the high standard of guaranteed authenticity and target a specific segment in the world-wide food market. DO-labelling policy can present a real opportunity for EU foreign trade in the free global market, if the products are well identified and recognised by consumers.

More information

Project website: <http://www.typic.org>
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Project Essentials

Full Project name:

Typical food products in Europe: Consumer preference and objective assessment

Project Acronym: TYPIC

Project type: Shared Cost Project– FP5

Theme: Quality of Life

Contract No.: QLK1-CT-2002-02225

Project Start Date: 01/01/2003

Duration: 36 months

Total Budget: € 2 507 210

EC Contribution: € 1 679 890

Project Collaborators:

National Agricultural College of Clermont-Ferrand (FR), Institute of Food Research, Norwich (UK), French National Institute for Agronomic Research, Nantes (FR), State Teaching and Research Centre for Agriculture, Viticulture and Horticulture, Neustadt (DE), Spanish Council for Scientific Research, Sevilla (ES), Agricultural Economics Unit – SIA Aragon Government, Saragossa (ES), Technical University of Munich (DE), Agricultural Research Centre of Gembloux (BE)

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This publication, produced by the Directorate-General for Research (DG Research) of the European Commission (EC), brings together some projects in the area of traditional food. The task of promoting and sustaining traditional foods involves research into nutritional benefits, food technology and modern production techniques, and supports SMEs research investments. This publication hopes to increase awareness on the role that traditional foods play in sustainable economic development, in enhancing the health of consumers and in protecting cultural heritage. It highlights the challenges in this sector and provides information to stakeholders and general public, not yet familiar with this topic.

