

Draft
Thematic Priority 5:
Food Quality and Safety
4th Thematic call
Published June 2005 for funding in 2006

Work Programme
for the specific programme for research,
technological development and
demonstration:

"Integrating and strengthening
the European Research Area"

Table of contents

0	General Introduction	3
I.	Focusing and Integrating Community Research	3
5	Priority Thematic Area 5: Food Quality and Safety	3
5.1	<i>Introduction</i>	3
5.2	<i>Objectives, Structure and Overall Approach</i>	4
5.3	<i>Technical Content</i>	6
5.4	<i>Areas</i>	6
5.4.1	Area: Total food chain	6
5.4.2	Area: Epidemiology of food-related diseases and allergies	8
5.4.3	Area: Impact of food on health	9
5.4.4	Area: Traceability processes along the production chain	10
5.4.5	Area: Methods of analysis, detection and control	11
5.4.6	Area: Safer and environmentally friendly production methods and technologies and healthier food stuffs	12
5.4.7	Area: Impact of animal feed on human health	14
5.4.8	Area: Environmental health risks	15
5.5	<i>Specific Support Actions</i>	17
5.6	<i>Links to other Research Topics</i>	21
5.7	<i>Implementation Plan and Related Issues</i>	22
5.8	<i>Call Information</i>	24
II.	GENERAL ANNEXES	28
A)	<i>Overview of Calls for Proposals foreseen in this Work Programme (see relevant work programme part for details)</i>	28
B)	<i>Common evaluation criteria for evaluating proposals</i>	28
C)	<i>List of Groups of target countries for specific measures in support of International Cooperation</i>	28

0 General Introduction

For the latest version of the general introduction see the document entitled “General Introduction” on the website http://www.cordis.lu/fp6/sp1_wp.htm

I. Focusing and Integrating Community Research

5 Priority Thematic Area 5: Food Quality and Safety

5.1 Introduction

The primary objective of this Thematic Priority is to improve the health and well-being of European citizens through higher quality food and improved control of food production and related environmental factors. This approach re-addresses the classical “farm-to-fork” approach by giving priority to consumers’ demands and rights for high quality and safe food. Taking the “fork-to-farm” approach provides the primary driver for developing new and safer food production chains and foods, relying in particular on biotechnology tools and taking into account the latest results of genomics research. The anticipated benefits will be achieved by developing and integrating research in a way that food from farming, including fishing and aquaculture, is produced, distributed and consumed along the various stages of the food production chain and includes consideration of associated social and environmental factors and their influence on human health. International cooperation is an important aspect of this priority, particularly considering the international dimension of trade and global challenges affecting food quality and safety.

The research areas within this Thematic Priority thus address key aspects of food quality, safety and consumer concerns along the food chain. The approach starts with consumer health and well-being, quality, safety and consumer concerns, identifying the major issues, and then proceeds along the production chain, outlining issues associated with primary production, animal feeds, processing, distribution, consumption and environmental health risks related to the chain.

In all cases, a wider and innovative combination of disciplines beyond those traditionally used will be deployed, depending on the issue. In addition to combining production, processing, nutritional and analytical expertise, consortia should also draw on expertise from such areas as genomics, medicine, information technologies, ethics, environmental, economic and social sciences, as appropriate, to achieve their aims. Accordingly, integrated approaches that cross-cut several research areas and adopt a “total food chain” approach are anticipated.

The work programme outlines the research areas as described in the Specific Programme in which project proposals can be presented. The first area on “Total Food Chain” is all-encompassing and is intended to reinforce the desired “fork-to-farm” approach. The other areas focus on particular aspects of food quality and safety.

Taken in combination, the specified research areas form the backbone of the work programme and will be valid for all calls for proposals. The “Technical Content” section shows the topics selected for the call for 2006.

5.2 Objectives, Structure and Overall Approach

The research areas as described for 2006 specify crucial research topics along the complete food chain “from fork-to-farm” which have to be addressed. The rationale for the selection of these topics is based on several inputs, such as the analysis of the Expressions of Interest submitted in 2002. This analysis provided substantial information and guidance on the most immediate and pressing research challenges in the food safety and quality domains. Together with topics having emerged more recently and the projects selected or under negotiation from the first and second calls, the views and opinions of the Programme Committee, Scientific Advisory Groups and the relevant Commission departments have been taken into account in selecting the appropriate research topics. The specific research topics for the instruments of integrated projects and networks of excellence embrace – within a food chain context – human nutrition and quality of food on the plate, through to animal and crop production, whilst also addressing related processing factors and increasingly important environmental hazards associated with foodstuffs.

Strengthening the competitiveness of the European food and biotechnology sectors is an important objective of this priority theme, with particular attention being given to innovation aspects and broad participation of SMEs. Innovation-related aspects need to be clearly addressed and well-defined dissemination and exploitation plans presented, showing the optimal use of project results. SMEs play a vital role in the food chain and will be key to promoting innovation. With a target of 15% of the budget reserved for the participation of SMEs within FP6, all project consortia should make every effort to include SMEs wherever appropriate, in particular in integrated projects and networks of Excellence.

International cooperation with third countries world-wide is an important dimension for Framework Programme 6^{1,2} and is encouraged throughout all areas of this priority. A particular focus is on cooperation with the INCO target countries (list in Annex C), which includes the large majority of emerging, transition and developing economies, as well as with countries having signed bilateral science and technology cooperation agreements with the EU (Argentina, Australia, Brazil, Canada, Chile, China, India, Mexico, Morocco, Tunisia, Russia, South Africa, Ukraine, United States)³. Substantial funding is available for participants from INCO target third countries (see list in Annex C), in all areas of this workprogramme. Well-balanced and substantial participation of relevant third countries and/or INCO target countries as full partners within the project activities and budget is therefore recommended and encouraged.

Evaluation of the integrated projects and networks of Excellence will take place in a 2-stage procedure. Details can be found within the call (see section 5.8) and in the

¹ Information on the international scientific cooperation policy is available at:
http://europa.eu.int/comm/research/iscp/index_en.cfm

² See “INCO Infopoint on international co-operation activities” at:
http://www.cordis.lu/fp6/inco_focus.htm

³ As on December 2004.

documents “Guidelines on proposal evaluation and selection procedures”⁴ and the relevant Guide for Proposers⁵. In brief, first stage proposals will be concise suggestions of no more than 20 pages of text (excluding the ‘A’ forms). These will be evaluated by external panels and scored against a limited number of criteria, namely “Relevance” for both integrated projects and networks of excellence, “S&T excellence” and “Potential impact” for integrated projects and “Degree of integration and the joint programme of activities” for networks of excellence. All proposals passing the minimum thresholds will be invited to submit full proposals for evaluation at the second stage. Only proposals passing the first stage of evaluation for these instruments will be accepted for the second stage. Note that, for topics involving these instruments, following the second stage evaluation up to one proposal will be funded per topic.

For proposals submitted to this work programme, there will be one closing date for the first stage evaluation for integrated projects and networks of Excellence, and a further closing date for the full evaluation of the other instruments available in Priority 5 (specific targeted research projects, coordination actions, and specific Support actions).

When making proposals, consortia should take the following into account:

- Projects supported from the first two call in 2003 and 2004⁶ and topics published in the third call for 2005. Overlaps should be avoided wherever possible, but synergies between new proposals and funded projects are encouraged. Similarly, where topics within the work programme have links between them, proposers should address potential synergies and be careful to avoid redundancy by duplicating work described elsewhere. Additionally, synergies with the Information Society Technologies priority (thematic priority 2) in relation to health, and past projects related to information technology for health promotion and disease prevention, should be developed where relevant⁷.
- Current European policies, strategies and action plans. In particular, relevance to the Environmental Technology Action Plan (ETAP),⁸ the Life Sciences and Biotechnology Action Plan,⁹ and the European Environmental Health Strategy (SCALE initiative)¹⁰. The ETAP was adopted on 24 January 2004 and seeks to exploit technologies for their potential to improve both the environment and competitiveness. The Life Sciences and Biotechnology Action Plan was adopted on 23 January 2002 and seeks to promote the development of biotechnology consistent with European standards and safeguards. The European Environmental Health Strategy, adopted on 11 June 2003, aims to reduce diseases caused by environmental factors through better identification and understanding of diseases

⁴ <http://www.cordis.lu/fp6/find-doc.htm>

⁵ See the details for this 4th call at the website <http://www.cordis.lu/food/home.html>

⁶ See “Projects to be funded following 1st & 2nd calls for proposals” on <http://www.cordis.lu/food/home.html>

⁷ See http://www.cordis.lu/ist/directorate_c/ehealth/projectbooklet/projects.html (FP6) and <http://www.cordis.lu/ist/ka1/health/projectbooklet/projects.htm> (FP5)

⁸ <http://europa.eu.int/comm/environment/etap/>

⁹ http://europa.eu.int/comm/biotechnology/introduction_en.html

¹⁰ http://europa.eu.int/comm/environment/health/index_en.htm

caused by environmental degradation. The relevant action plan of SCALE was adopted by the Commission in Spring 2004. As emphasised by the S in the acronym, there is a strong focus in the SCALE initiative on science as a necessity for the development of strong policies.

- On 1 May 2004, 10 new countries became Member States of the European Union. These countries have been participants in the 6th Framework programme since its inception. In addition to these 10 new Member States, three candidate countries – Bulgaria, Romania and Turkey – are associated to the 6th Framework Programme. Croatia has also been granted the status of candidate country¹¹; although not yet associated to the 6th Framework Programme¹², Croatia may participate as a third country and is eligible for funding as INCO target country. Other associated states to the framework programme have rights of participation, albeit with some limitation on eligibility criteria (see section 5.8).
- The work programme has been designed to attract enhanced involvement from industry and, in particular, from SMEs, and proposals involving such partners are encouraged. At least 15% of the budget of the call is targeted at SME participation.
- Similarly, international cooperation with third countries is supported and encouraged throughout all areas of this thematic priority¹³ and many topics have been formulated to encourage international links. This includes partners worldwide (see “Cross-cutting issues” in the section “General information”), with a particular focus on INCO-targets and countries having signed bilateral agreements with the EU. Significant funds are available for support to partners from the nearly 150 INCO-targeted third countries listed in Annex C.

5.3 Technical Content

The work programme presented below introduces each area and gives a description of the topics open in 2005, for which project proposals are invited. For each topic, the work programme specifies the instrument to be used.

5.4 Areas

5.4.1 Area: Total food chain

Projects will address quality and safety aspects of the complete food chain from consumption back to primary production including feed production. The objective will be to develop foods with higher quality and safety together with

¹¹ As from June 2004.

¹² As at December 2004.

¹³ See “International cooperation in FP6” at: <http://www.cordis.lu/food/inco.htm>

clear health benefits for consumers. Sustainable production systems should be developed under appropriate ethical, animal welfare, environmental, economic and societal considerations.

These benefits may result from approaches such as:

- **Foods from low input production systems**
- **The integration of recent human nutritional results and considerations within improved food production systems**
- **Developments using genomics of a European crop with proven human health advantages**
- **Process innovation leading to low or zero pathogenic loads on food.**

These approaches will utilise diverse strategies and will incorporate a variety of methodologies and disciplines relevant to the whole food chain by cutting across the areas as outlined in the Specific Programme for this priority.

T5.4.1.1 Improving the quality of pork and pork products for the consumer (IP)

The aim will be to improve the quality of pork and pork products by identifying and addressing those aspects of the entire food chain from fork-to-farm that influence quality, traceability, impact on consumption or may give rise to societal concerns. Multi-disciplinary approaches, exploiting the latest advance in genomics, biochemistry, physiology and covering food quality, animal health and welfare, economic performance, production, processing and consumer expectations in a wide range of production systems (from intensive to extensive, and covering high and low input systems) will be preferred. Where applicable, collaborative research shall be carried out on pilot total production chains. The project will lead to safe pork products with both improved quality and nutritional aspects that are more convenient to prepare and match consumer demands in their diversity. While the key objective of the project development is quality, safety issues should be addressed where relevant. Industrial partners are expected to play a pivotal role in this topic. Proposals should address the objectives of the ETAP. The participation of INCO target countries is strongly encouraged.

T5.4.1.2 Improving the safety of beef and beef products for the consumer in production and processing (IP)

The project will encompass the entire food chain from fork to farm using a multidisciplinary approach. It will focus on the delivery of safe, added value beef products including diversification into new beef products. The project should consider essentially safety issues including control strategies for a range of pathogens and chemical contaminants along the whole production chain. The project will thus integrate research on beef production, engineering and biotechnology, product development and the exploitation of new technologies to produce beef products with improved safety. While the key objective of the project development is safety, nutritional and eating quality, as well as convenience and acceptability, should be addressed. SMEs are expected to play a pivotal role in this topic. Proposals should

address the objectives of the ETAP. The participation of INCO target countries is strongly encouraged.

5.4.2 Area: Epidemiology of food-related diseases and allergies

The objective is to examine the complex interactions between food intake and metabolism, immune system, genetic background and socio-economic factors to identify key risk factors and develop common European databases.

Many diseases and disorders prevalent in Europe today can be linked to diet, genetic make-up and lifestyle. Research in this area will use pan-European epidemiological studies concentrating on the most important nutrition-related diseases and disorders to identify vulnerable population groups, links to diet, genetic factors, and assess how an improved diet might reduce prevalence in the future.

Research will focus on: epidemiological studies of the effect of diet, food composition and lifestyle factors, on the health of consumers and specific population groups such as children, and the prevention or development of specific diseases, allergies and disorders; methodologies for measuring and analysing food composition and dietary intake, risk assessment, epidemiological and intervention models; influences of genetic variability using advances in functional genomics.

Synergies with the Information Society Technologies priority are encouraged (see 5.2, above).

T5.4.2.1 Nutrient status and requirements of specific population groups (NoE)

The aim is to provide and collate data about the status and the requirements of selected nutrients, particularly micronutrients, for specific vulnerable population groups identified by the proposers (such as infants, children, adolescents, pregnant women, lactating women, post-menopausal women, elderly people, immigrants and/or low-income groups) in order to harmonise dietary recommendations Europe-wide. Existing epidemiological data from different population groups will be compared and harmonised, and new data will be provided – where necessary – in view of developing European dietary guidelines. As a result, consumer understanding will be improved and behavioural changes will be facilitated by communication to consumers, food chain operators, health professionals and policy makers. The participation of industry, new Member States and candidate countries is strongly encouraged, while the involvement of consumer organisations is essential.

T5.4.2.2 Influence of dietary history on coeliac disease (STREP)

The main objective will be to study the influence of dietary history including early nutrition on the development of coeliac disease in relation to genetic factors. An expected result is the identification of the molecules involved in the expression of the disease and the genes they are linked to.

5.4.3 Area: Impact of food on health

There is increasing evidence that consumption of certain types of food within a balanced diet may have a positive and even protective effect on health. The objective is to provide the scientific basis for improving health through diet. This will involve the use of dietary advice strategies, the development of new health promoting foods, e.g. new products, products resulting from low-input or organic farming, functional foods, products containing genetically modified organisms and those arising from recent biotechnology developments. It will be achieved by means of an improved understanding of food metabolism and by harnessing the opportunities now available from proteomics and biotechnology.

Research will focus on: overall relationship between diet and health; health promoting properties of foods; effects of food components, pathogens, chemical contaminants and new agents of prion type on health; nutrient requirements and health promoting intervention strategies; determinants of consumer attitudes towards food products and production; methodologies for risk/benefit assessment of nutrients and of bioactive compounds; specificities of different population groups, particularly the elderly and children.

Synergies with the Information Society Technologies priority are encouraged (see 5.2, above).

T5.4.3.1 Milk and dairy products with optimised bioactivity (IP)

The objective will be to address the mechanistic basis and provide molecular biomarkers for the development of dairy foods with nutrition and health claims. A prior genomics-, proteomics and metabolomics-based analysis of their effect shall be carried out. Among the expected results are innovative dairy products with nutrition and health claims (“functional foods”), modified or new safe (bio-)technological processing methods, the valorisation of by-products and/or new breeding and feeding strategies of ruminants. Knowledge generated from these areas will support application-oriented activities including ETAP issues, safety evaluation, legal issues, substantiation of health claims and consumer acceptability. Broad participation from the industry including SMEs is strongly encouraged.

T5.4.3.2 Food components reducing the risk of dental diseases (STREP)

The objective is to investigate the effects of food and beverage components on the mechanism of development of major dental diseases with the aim of risk reduction and possibly designing specific foods with nutrition and health claims (“functional foods”). The project should aim to identify the individual components in such foods that are responsible for these observed effects and should also consider oral microflora and possible physiological side-effects of these components. Processing methods able to increase the positive impact of these components on oral health should be investigated. The participation of industry, including SMEs, is strongly encouraged.

T5.4.3.3 Optimising food processing for nutritional and environmental quality (STREP)

The topic aims to study the impact of processing on the environment and on the nutritional quality of food and its benefits to consumers' health by following markers of food quality. The single and combined effects of formulations, product structure, unit operations including fermentation, packaging and storage should be taken into account, with the focus being on the improvement and implementation of existing or traditional technologies and not on emerging technologies. Expected results are improved quality (including bioavailability) and safety of foods as a result of better understanding of product-process interactions and process management on an industrial scale with respect to health benefits, environmental (ETAP) and economical aspects as well as consumer acceptance. Partnership with the industry, in particular SMEs, and with INCO target countries is strongly encouraged.

5.4.4 Area: Traceability processes along the production chain

The objective is to increase consumer confidence in the food supply by strengthening the scientific and technological basis for ensuring complete traceability along the entire food chain including animal feed. It will ensure that products can be linked to their source while also protecting products of declared origin (both geographical and production system). It will also help to support the traceability of genetically modified organisms, and other products based on recent biotechnology developments, from raw material origin to purchased food products.

T5.4.4.1 Origin and development of unintended micro-organisms in the food and feed chains (IP)

The objective is to develop and improve methods for tracing the origin of biological agents contaminating (including as the result of a criminal act) food (also bottled or canned drinking water) and animal feed and to model their development (growth, proliferation and toxicogenesis) as a function of ambient (e.g. temperature and relative humidity) and processing conditions, and their point of entry into the food chain (including the home environment). Work will include, *inter alia*, the utilisation of available genomic and other information on micro-organisms and their toxins (if appropriate), the use of bio-markers and fingerprinting, the exploitation of information on the epidemiology of zoonoses, increased understanding of the physiology of growth and proliferation, taking into account already existing ecological data on the most important agents and substances, the consolidation of existing models and, where appropriate, the development of new models. The results and information collected by the project should also serve to distil a set of recommendations that can help to control any risks. The partnership should reflect industry's involvement in this field and preferably take advantage of knowledge available in non-EU countries. The participation of INCO target countries is strongly encouraged.

T5.4.4.2 Emerging technologies for food/feed traceability including monitoring the manufacturing and handling practices in the total chain (IP)

The objective is to identify, scale up, validate and demonstrate for a wide range of products (and covering also products composed of or containing genetically modified ingredients) the emerging technologies and research findings for routine traceability applications to be integrated in food/feed production, transportation/distribution systems and to monitor manufacturing and handling practices along the total chain. The scaling-up will require a strong scientific component to conceive and develop its scientific bases in order to ensure reliable results and to verify and guarantee that the standards achieved in laboratory or small-scale applications are also met under industrial and routine field conditions. Scientific inputs are further needed to ensure that the technologies comply with the objectives of the ETAP. The partnership should reflect industry's involvement in this field and preferably take advantage of knowledge available in non-EU countries. The participation of INCO target countries is strongly encouraged.

5.4.5 Area: Methods of analysis, detection and control

The objective is to contribute to the development, improvement, validation and harmonisation of reliable and cost-effective sampling and measurement strategies for chemical contaminants and existing or emerging pathogenic micro-organisms (such as viruses, bacteria, yeasts, fungi, parasites, and new agents of the prion type including development of ante mortem diagnostic tests for BSE and scrapie) so as to control the safety of the food and feed supply and ensure accurate data for risk analysis.

With changes in production methods, processing technologies and distribution systems, many pathogens and contaminants are controlled ever more rigorously today. However, new pathogens or food safety issues may arise as a consequence of factors outside the control of the food producer. Increasingly, foods do not come from one source or one country, but are a combination of raw materials coming from many diverse countries and very different production systems. The aim will be to improve detection and control techniques along the food production chain, using powerful new and more sophisticated technologies linked to primary production, ensuring that the original contamination does not enter the chain at critical points. Particular attention will be given to possible anticipation and control of emerging risks in food and feed including new contaminants and pathogens, non-conventional agents and stress adaptation of pathogens. Projects should take account of aspects of communication with stakeholders, especially consumers.

Research will focus on: methods and standards for analysing and detecting food-borne pathogens and chemical contaminants, including pre-normative aspects; modelling and approaches to improve existing prevention and control strategies; detection tests and geographical mapping of prions; transfer and longevity of prions.

T5.4.5.1 Quality and safety control strategies for food (NoE)

The objective is to develop common strategies for harmonising and validating detection methods and technologies while providing an economic analysis of their application into new HACCP systems at critical stages of the food production and supply chains. These strategies should also provide the operational designs of user-friendly databases for various hazards in food based on standardised data. Novel operational approaches for the production of ready-to-use guidelines on risk assessment and tools for stimulating e-learning should also be conceived. The involvement of retailers and of SMEs specifically engaged in high technology is essential. The participation of partners from INCO target countries and third countries is strongly recommended.

T5.4.5.2 Developing improved TSE inactivation methods (STREP)

This STREP will develop technologies which inactivate TSE infectivity in preferably all of the following substrates: abattoir equipment, abattoir products and meat and bone meal. Technology transfer to a medical setting (medical instruments, blood and blood products) is desirable. The technologies must perform in a manner appropriate to the requirements of the end-user. They should be rapid, cost effective, simple and safe to operate and may produce useful by-products where appropriate. The possible uses of inactivation methods raise sensitive issues and the proposal must address consumer concerns and legislative aspects with the involvement of consumer's organisations. The involvement of SMEs is greatly encouraged. Strong emphasis is placed on demonstration of inactivation by the technologies taking active account of existing research work.

T5.4.5.3 BSE infectivity of milk, milk products and meat derived from goats (STREP)

The first objective of this STREP is to determine the tissue infectivity distribution of BSE after oral exposure of goats through the exploitation of existing research results and through the conduct of additional research. This work should focus on intestines, peripheral nervous tissues, lymph nodes, muscle tissues and milk. The influence of genotype and age should be included. The research should be planned in such a way that the results can be exploited to quantify the risk posed by the consumption of milk, milk products and meat of goats. A second objective is the improvement of transgenic mouse models as acceptable diagnostic assays for BSE in small ruminants that are significantly quicker than the classical mouse panel bioassays.

5.4.6 Area: Safer and environmentally friendly production methods and technologies and healthier food stuffs

The objective is to develop lower input farming systems (agriculture and aquaculture) based on systems such as integrated production, lower input methods including organic agriculture. It will emphasise the use of plant and animal genomics, biotechnologies, and other innovative technologies, and

improved transformation processes aimed at delivering safer healthier nutritious, functional and varied foodstuffs, and animal feed, which respond to consumer expectations.

Consumers require healthy, safe and high quality food. Food production systems are tending towards those which are more sustainable, more environmentally- and welfare-friendly, and which have lower requirements for inputs, such as lower-input crops. Following the fork-to-farm approach, research on production methods should aim to meet these consumer requirements.

T5.4.6.1 Reducing the use of plant protection products (NoE)

The purpose is a durable restructuring of European research and development work on the use of plant protection products. The NoE should aim to reduce the use of these chemicals by including both fundamental research to deepen our understanding of the biology, ecology, behaviour and underlying genetics of the crop-pest system, and appropriate applied work (i.e. new and innovative technologies) to ensure that results are translated into practice. The network should include the expertise and knowledge available in the new Member States, and its restructuring should extend to projects already under way. It would be desirable to include in the network those working in or for INCO target countries whose agricultural products are exported to Europe. The NoE should establish itself as a world leader for the development and implementation of durable pest control strategies, and should become recognised as the first point of reference in Europe not only for scientists but also for legislators and users. Industrial participation is recommended.

T5.4.6.2 Management of waste from farms and fisheries (CA)

The objective is to coordinate research on sustainable waste management by identifying solutions to current critical issues. It will help develop solutions that protect the environment and reduce the nuisance value (e.g. odour) of wastes from intensive farming systems. Results will be improvements in knowledge and technologies for the control of pollution and odour, for alternative waste handling systems and for the impact of waste recycling on surface water and in soil. The project may also include alternative production systems, and the inclusion of appropriate partners from INCO target countries is strongly encouraged. The project will take into consideration the objectives of the ETAP.

T5.4.6.3 Linking national research communities working on *E. coli* O157 research (CA)

The objective is to add value to European and international research groups (including those from INCO target countries) working on *E. coli* O157:H7 and other potentially pathogenic strains and serotypes of *E. coli*. The result will be a durable network of such groups, increased synergy in research outputs and, eventually, reduced incidence of *E. coli* O157 infection in humans.

T5.4.6.4 High throughput analysis of plant composition and metabolism (STREP)

The aims are to develop and validate a phenotyping platform (set of technologies, tools and methodologies) for breeding or engineering plants with improved nutritional quality and also to facilitate the analysis of “substantial equivalence”, and to communicate and disseminate the results to appropriate sectors of the user community, including human nutrition and medicine, food processing, plant breeding, plant biotechnology, plant science research, and regulatory authorities. The set of core technologies to be developed will allow the high throughput profiling and identification of plant metabolites, including trace elements. It will focus on those metabolites potentially implicated in human health and disease and how genotype, growing conditions, storage, transport and processing affect their content. The project should conclude with a practical demonstration of the platform on two or more plant species chosen from different families of the major European food crops. Participation of SMEs and INCO target countries is strongly encouraged.

T5.4.6.5 Reduced fertiliser inputs through improved management of soil microbes (STREP)

The overall objective is the development of innovative soil- and crop-management practices for the production of quality food products. The project should be tightly focused on one particular cropping system and on a limited number of selected/identified micro-organisms. It should seek to improve interactions between soil micro-organisms and plants so as to enhance mutual benefits and reduce or eliminate the requirement for particular chemical inputs. The inclusion of a demonstration action and the transfer of results into practical implementation on the farm will be welcome. SMEs are expected to play a significant role in this topic, and participation of INCO target countries is strongly encouraged.

T5.4.6.6 Disease risk from alternative and enriched cage systems (STREP)

The purpose of this project is to provide new quantitative data that will improve the evaluation of the risk to the consumer of potentially increased contamination of eggs (with infectious agents, or with the veterinary treatments used to control them) resulting from a move to more welfare-friendly egg-production systems that will replace the un-enriched battery cage. Concentrating on production in various furnished cage and alternative systems, it will propose methods of reducing any potential, additional risks generated by these systems, taking into account the need to maintain a high quality product.

5.4.7 Area: Impact of animal feed on human health

The objective is to improve understanding of the role of animal feed, including products containing genetically modified organisms and the use of sub-products of different origins for that feed, in food safety. It will aim to reduce the use of undesirable raw materials and develop alternative new animal feed sources. This will include novel sources of the major feed components, energy, protein and fat,

and the evaluation of the impact of additives in feeds, and of alternatives to common additives.

T5.4.7.1 Feed safety control (STREP)

The aim is to develop, and validate for routine application, new (including novel development of existing techniques), advanced, standardised and rapid sub-sampling and analytical techniques (including test-kit methodology) for screening and quantifying the presence of undesirable substances in animal feed (as defined in Directive 2002/32/EC). Special emphasis should be given to the requirements of the new Member States, candidate and third countries exporting to the EU, in complying with legislation. Participation from these states and of SMEs is encouraged. The proposal should address one or more of the following three groups of substances:

- Animal Protein: detection of the presence of species-specific animal proteins in animal feed;
- Organic substances of various biological origins: detection of intrinsic plant toxins and undesirable botanical impurities (e.g. *Ricinus communis* and *Datura stramonium*) by analysis of their toxic substances (in many cases alkaloids) and of ergot alkaloids;
- Miscellaneous substances of extraneous origin: detection of multiple analytes of authorised veterinary drugs and feed additives that may have been carried over in non-target feeds during the feed production process; detection of multiple analytes of prohibited antibiotics and coccidiostats in animal feed; and detection of dioxins and dioxin-like substances in animal feed.

5.4.8 Area: Environmental health risks

The objectives are to identify the environmental factors that are detrimental to health, understand the mechanisms involved and determine how to prevent or minimise these effects and risks.

(a) Risks linked to the food-chain (chemical, biological and physical).

(b) Combined exposures of authorised substances, including impact of local environmental disasters and pollution on the safety of foodstuffs, with emphasis being placed on cumulative risks and health impacts of environmental pollutants, transmission routes to human beings, long-term effects and exposure to small doses, prevention strategies, as well as the impact on particularly sensitive groups, and especially children.

The environment can significantly affect human health. Environmental impacts on human health result from a complex interaction between genetic susceptibility, metabolic activity, environmental exposure and behaviour and socio-economic factors. Food is clearly an important exposure route but it should not be considered in isolation since other direct environmental exposures, via air, soil and water, can be equally or more important.

Research will focus on: identification of causal agents including contaminants, and physiological mechanisms, of environmental, and food-linked environmental hazards; understanding of exposure pathways, estimation of cumulative, low dose and combined exposures; long-term effects; definition and protection of susceptible subgroups; environmental causes and mechanisms responsible for the increase in allergies; impact of endocrine disrupters; chronic chemical pollution and combined environmental exposures, transmission of illnesses linked to water (parasites, viruses, bacteria, etc.).

The research activities carried out within this thematic priority area will include exploratory research at the leading edge of knowledge on subjects closely related to one or more topics within it. Two complementary approaches will be utilised: one receptive and open, the other proactive.

T5.4.8.1 Investigating the cause of allergy (IP)

The aim will be to explore potential preventable causes explaining the rise of immune-mediated health problems, such as food allergies (excluding food intolerances), utilising, where possible, non-invasive testing methods and taking full advantage of genomics/proteomics techniques. Investigation should focus on complex interactions between changes in environment, food or lifestyle. "Classic" hypotheses (e.g. hygiene hypothesis) and novel hypotheses (e.g. related to changes in lifestyle – hyperpermeability hypothesis) should be investigated. The primary focus will be on the causes, rather than triggers, of allergy onset. However, determination of thresholds which elicit sensitisation and allergic reactions to food allergens in support of recent food labelling legislation should be carried out. SME involvement in the development of detection methods and test kits and other aspects of the study is encouraged. Involvement of new Member States would help to exploit geographical and lifestyle differences within Europe. Involvement of non-EU countries could be advantageous. The proposed project should aid in implementing the Commission's Environment and Health strategy.

T5.4.8.2 Investigation of potential health impacts of long-term exposure to disinfection by-products in drinking water (STREP)

The aim is to investigate potential human health risks (e.g. cancer, premature births, miscarriage, birth defects, reproductive effects) associated with long-term exposure to low levels of disinfectants (such as chlorine) and disinfectant by-products occurring in water for human consumption and use in the food industry. The studies should comprise risk/benefit analyses including quantitative assessments of risk associated with microbial contamination of drinking water versus chemical risk and possibly comparing alternative treatment options. The main outcome will be improved risk assessment/management. SMEs specialised in measurement of water contamination and third country participants would be encouraged to take part.

T5.4.8.3 Pathogens in drinking water sources (STREP)

The objective is to gather knowledge on emergent microbial pathogens in drinking water sources. Human health impacts of emergent micro-organisms should be further investigated. If necessary, new methods or methods derived from existing applications

to detect and quantify yet non-identifiable micro-organisms should be developed. The successful consortium would be expected to include significant industrial participation including SMEs.

5.5 Specific Support Actions

The objectives of specific Support actions (SSAs) under this priority are to help implement the European Research Area (ERA), support, stimulate and facilitate the participation and cooperation of SMEs and participants from third and candidate countries, and improve policy support and dissemination/exploitation of results. SSAs contributing towards the “EU Strategy for Life Sciences and Biotechnology” are also invited. Specific support actions under these objectives can include conferences, seminars, studies and analyses, working and expert groups, operational support, and dissemination of information and communication, or combinations thereof.

Mentioned below, for each horizontal objective, are a number of strategic actions, which serve as examples. This list is not exhaustive and any proposal that fits one or a number of the horizontal objectives may be submitted under this call. The topic of the SSA proposal has to fall within the general objectives and scope of the Thematic Priority “Food quality and safety” as described in the decision on the specific programme¹⁴.

In view of the particular focus of this call towards improving international cooperation with third countries a particular emphasis is given to SSAs contributing to international cooperation with INCO target countries and with countries having signed bilateral S&T cooperation agreements with the EU¹⁵. Well-balanced and substantial participation of third countries and/or INCO target countries within the project activities and budget is therefore recommended and encouraged. During the evaluation of proposals particular attention will be given to projects ensuring a substantial participation of these countries, both in terms of activities and budget.

Achieving the ERA objectives

Examples are:

- SSAs analysing the feasibility in preparation for a Technology Platform,
- Networking of national research activities/ programmes on biotechnology, agriculture¹⁶ and food for developing countries,

¹⁴ See the relevant section of the Specific Programme: Council decision adopting a specific programme for research, technological development and demonstration: "Integrating and strengthening the European Research Area" (2002-2006) (2002/834/EC) of 30.09.02 at <http://www.cordis.lu/fp6/find-doc.htm>

¹⁵ For a list of INCO target countries see Annex. The countries having signed bilateral cooperation agreements with the EU are: Argentina, Australia, Brazil, Canada, Chile, China, India, Mexico, Morocco, Tunisia, Russia, South Africa, Ukraine, United States (as on December 2004).

¹⁶ The term “agriculture” along this text covers also fishing and aquaculture.

DRAFT

- Economic analyses of the potential transition costs towards a bio-economy and the impact of public policies measures in lowering these costs, in particular the impact of further research and technology development on production costs of bio-based products.

Promoting SME participation

Examples are:

- Networking regional biotechnology clusters in the enlarged European Union and beyond (e.g. western Balkans, Russia...),
- Initiatives and tools to facilitate uptake of new technologies by SMEs.

Stimulating international cooperation

- Whereas participation of INCO target and other third countries is welcome in all SSA proposals, this heading includes those initiatives that have a primary objective of stimulating international cooperation.
- Initiatives addressing global aspects of biotechnology, agriculture and food research and development, such as world-wide food quality and safety, conservation of natural agricultural and forestry resources – including water, soils and genetic resources – and biodiversity, responding to global challenges such as climate change, poverty alleviation and sustainability. The participation of at least one partner from third countries, particularly INCO target countries, is compulsory for SSAs addressing international cooperation. During the evaluation of proposals particular attention will be given to projects ensuring a substantial participation of these countries, both in terms of activities and budget. Particular examples are:
 - International platform on global challenges in biotechnology, agriculture and food research, including the addressing of emerging risks. This platform should include relevant third countries world-wide, particularly those having signed bilateral S&T cooperation agreements with the EU.
 - Review of international research activities on the potential impact of global warming and climate instability on sustainable agriculture and the total food chain: research already carried out, scenarios and research needs.
 - Global sustainability initiative on research and technology applications in the field of agriculture and biodiversity.¹⁷
- Initiatives aimed at networking and training national contact points from INCO target countries for biotechnology, agriculture and food research
- Initiatives in the field of biotechnology, agriculture and food research, aimed at stimulating RTD cooperation with countries having signed bilateral S&T cooperation agreements with the EU (cooperation platforms, fora, networks, international workshops, brokerage events, etc.), in particular with the following

¹⁷ It should include activities aiming to maintain/increase/protect "agricultural" biodiversity (animal breeds, crop varieties and specific micro-organisms associated with animals and crops), to improve knowledge, management and control of "associated" biodiversity (pollinators, pests, natural enemies) and to respect "external" biodiversity (wild fauna and flora).

countries: Argentina, Australia, Brazil, Chile, China, India, Mexico, Morocco, New Zealand, Russia, South Africa, Tunisia, and Ukraine.

- Initiatives aimed at promoting bi-regional dialogues through research activities and networks in the field of biotechnology, agriculture and food sciences and technologies, in particular the following geographical areas:
 - EU – western Balkans,
 - EU – Mediterranean,
 - EU – Black Sea Region,
 - Southern and Western Asia.

Initiatives supporting policy development

Expert groups, workshops and other actions supporting policy development. In particular, the following examples:

- Review and dissemination of research on organic agriculture for the benefit of developing countries. It should include an analysis of needs and constraints of developing countries in the field of organic agriculture, taking into account the changes in organic standards and import requirements following the EU Action Plan for Organic Food and Farming¹⁸ as well as recommendations for future research. (The review should cover production, trade and certification issues and should address the needs of different stakeholders of the sector).
- An initiative contributing to promote the debate and social dialogue in EU Member States and candidate countries on the practice of the slaughter of animals by certain religious methods (*shechita* or *halal* methods). The initiative should review national legislation and research in this field, as well as analyse the scale of this practice in Member States and associated states. Special attention should be given to socio-economic and consumer aspects. The involvement of religious authorities, consumer associations and NGOs is encouraged.

Linking with new Member States and associated candidate countries

Facilitating the integration of new Member States and associated candidate countries in European research in areas such as biotechnology, agriculture and food, through networking, conferences, workshops or other activities. Particular attention should be given to the participation of candidate countries (Bulgaria, Croatia, Romania and Turkey). An example:

- Food safety and quality research platform of candidate countries for EU accession.

¹⁸ http://europa.eu.int/comm/agriculture/qual/organic/plan/index_en.htm

Dissemination/exploitation of research

Examples are:

- Assessment of results of FP4 and FP5 non-food agro-industrial research and biomaterials projects in terms of their economic utility, taking into account rising fossil fuel prices, and dissemination and technology transfer of selected results (study plus support measures),
- European database on endocrine disrupters: setting-up of a publicly available and user-friendly database of hormone-disrupting compounds that have been investigated or are being investigated in Commission-funded FP4, FP5 and FP6 research projects and, where applicable, national research programmes in Europe. Account should be taken of ongoing endeavours in constructing databases in this field in Europe.

Contributing to the “EU Strategy for Life Sciences and Biotechnology”¹⁹

Example:

- Initiatives to address the cultural and social attitudes towards food across Europe in order to assist and enhance the communication and implementation of results of food-related research (including effects, inter alia, of gender and age).

SSA proposals that fall under public procurement laws, such as prospective studies, impact assessment, actions supporting legislation, etc., cannot be financed under an open call for proposals.

Detailed financial plans, including co-financing or contributions in kind of third parties, should be submitted with the proposal. In the case of applications for networking or other support services, the financial plans should also indicate how sustainable functioning of these services is to be achieved once EU support comes to an end.

5.6 Links to other Research Topics

Fundamental knowledge in genomics (including human/animal/plant) is covered by the first priority, as is its applications to human health²⁰. Applications to food are covered by the fifth priority (for example relating to nutrition/better quality food). Other issues related to life sciences are addressed under the sixth priority²¹ or covered, as appropriate, by policy oriented research²². This includes the common agricultural policy (CAP) and the common fisheries policy (CFP) as well as Community policies related to health and environment.

¹⁹ http://europa.eu.int/comm/biotechnology/introduction_en.html

²⁰ <http://www.cordis.lu/fp6/lifescihealth.htm>

²¹ <http://www.cordis.lu/fp6/sustdev.htm>

²² <http://www.cordis.lu/fp6/support.htm>

5.7 Implementation Plan and Related Issues

The selected topics may be open only for the call indicated, and it is envisaged that, for topics utilising the integrated project or network of Excellence instruments, up to one project will be funded for each topic. There may be competition between proposals submitted on different topics and proposals submitted on the same topic. This may result in some topics not being supported.

Number of participants and budget per instrument for each area in the fourth call for proposals

Instrument	Number of participants	Indicative budget per group of instruments
Integrated projects	See general Rules for Participation	€3m
Networks of excellence	See general Rules for Participation	
Specific targeted research projects	See general Rules for Participation	€4m
Coordination actions	See general Rules for Participation	
Specific Support actions	See general Rules for Participation	€8m

ROADMAP – Thematic priority 5 “Food quality and safety”

Type of Activity		Indicative budget		Type of instrument Open in each call
Focussing and integrating Community research		Date of publication in OJ: [date]		
Thematic Priority	Area	Deadline for submitting proposals		
		September 2005²³	January 2006	IP – Integrated projects NoE – Networks of excellence STREP – Specific targeted research projects CA – Coordination actions SSA – Specific Support actions
5. Food quality and safety	Total food chain	€3m	€42m	IP, NoE, STREP, CA, SSA
	Epidemiology of food-related diseases and allergies			
	Impact of food on health			
	“Traceability” processes along the food production chain			
	Methods of analysis, detection and control			
	Safer and environmentally friendly production methods and technologies and healthier foodstuffs			
	Impact of animal feed on human health			
	Environmental health risks			

²³ Deadline for stage one of 2-stage evaluation. See section 5.8.

5.8 Call Information

Call information – Integrated Projects and Networks of Excellence

1. **Specific Programme:** Integrating and strengthening the European Research Area
2. **Activity:** Priority thematic area of research “Food quality and safety”
3. **Call title:** Thematic call in the area of “Food quality and safety”
4. **Call identifier:**²⁴ FP6-2005-FOOD-4-A
5. **Date of publication:**²⁵
6. **Closure date(s):**²⁶ September 2005
For those proposals passing the first stage evaluation, there will be a deadline of January 2006 for full proposals.
7. **Total indicative budget:** 83 million € broken down as follows

Instrument ²⁷	EUR million
IP and NoE	83
STREP and CA	0
SSA	0

8. Areas called and Instruments:

Area	Topic	Instrument
5.4.1 Area: Total food chain	T 5.4.1.1	IP
	T5.4.1.2	IP
5.4.2 Area: Epidemiology of food-related diseases and allergies	T5.4.2.1	NoE
5.4.3 Area: Impact of food on health	T5.4.3.1	IP
5.4.4 Area: Traceability processes along the production chain	T5.4.4.1	IP
	T5.4.4.2	IP
5.4.5 Area: Methods of analysis, detection and control	T5.4.5.1	NoE
5.4.6 Area: Safer and environmentally friendly production methods and technologies and healthier foodstuffs	T5.4.6.1	NoE
5.4.7 Area: Impact of animal feed on human health	void	void
5.4.8 Area: Environmental health risks	T5.4.8.1	IP

²⁴ The call identifier shall be given in the published version of this call.

²⁵ The director-general responsible for the publication of this call may publish it up to one month prior or after its envisaged publication date.

²⁶ When the envisaged publication date is advanced or delayed (see previous footnote), closure date(s) will be adjusted accordingly, if needed, in the published call for proposals.

²⁷ IP = Integrated project; NoE = Network of excellence; STREP = Specific targeted research project; CA = Coordination action; SSA = Specific support action.

9. Minimum number of participants:²⁸

Instrument	Minimum number of participants
IP, NoE	3 independent legal entities from 3 different MS or AS, with at least 2 MS or ACC. Where topics strongly encourage participation of INCO target countries, proposals must include at least one participant from an INCO target country in addition to the minimum participation required.

10. Restriction on participation: None.

11. Consortia agreements: Participants in IPs and NoEs are required to conclude a consortium agreement.

12. Evaluation procedure:

- The evaluation shall follow a two stage procedure, the second stage of which will include a remote evaluation.
- For the first stage, proposals should consist of no more than 20 pages using a minimum of a 12 point font
- For proposals which pass the first stage, coordinators will be asked to submit a full proposal by the given deadline (section 6, above)
- Proposals will not be evaluated anonymously.

13. Evaluation criteria:

- See Annex B of the work programme for the applicable criteria (including their individual weights and thresholds) per instrument.
- For the first stage evaluation, the criteria scored will be:
 - For integrated projects: Relevance; Potential Impact; S&T Excellence. The overall threshold will be a score of 12 out of a total possible 15.
 - For networks of Excellence: Relevance; Degree of Integration and the Joint Programme of Activities. The overall threshold will be a score of 8 out of a total possible of 10
- For the second stage evaluation the criteria and the individual and overall thresholds will be as described in Annex B of the work programme.

14. Indicative evaluation and contractual timetable:

- Evaluation results: Results from the first stage will be available in October 2005 and final results are estimated to be available within some 4 months after the January 2006 closure date.
- Contract signature: It is estimated that the first contracts related to this call will come into force before the end of 2006.

²⁸ MS = Member States of the EU; AS (incl. ACC) = Associated States; ACC = Associated candidate countries. Any legal entity established in a Member State or associated state and which is made up of the requested number of participant may be the sole participant in an indirect action.

Call Information – Specific Targeted Research Projects, Coordination Actions and Specific Support Actions

1. **Specific Programme:** Integrating and strengthening the European Research Area
2. **Activity:** Priority thematic area of research “Food quality and safety”.
3. **Call title:** Thematic call in the area of “Food quality and safety”.
4. **Call identifier:**²⁹ FP6-2005-FOOD-4-B
5. **Date of publication:**³⁰
6. **Closure date(s):**³¹ September/October 2005
7. **Total indicative budget:** 42 million € broken down as follows

Instrument ³²	EUR million
IP and NoE	0
STREP and CA	34
SSA	8

8. Areas called and Instruments:

Area	Topic	Instrument
5.4.1 Area: Total food chain	void	void
5.4.2 Area: Epidemiology of food-related diseases and allergies	T5.4.2.2	STREP
5.4.3 Area: Impact of food on health	T5.4.3.2	STREP
	T5.4.3.3	STREP
5.4.4 Area: Traceability processes along the production chain	void	void
5.4.5 Area: Methods of analysis, detection and control	T5.4.5.2	STREP
	T5.4.5.3	STREP
5.4.6 Area: Safer and environmentally friendly production methods and technologies and healthier foodstuffs	T5.4.6.2	CA
	T5.4.6.3	CA
	T5.4.6.4	STREP
	T5.4.6.5	STREP
5.4.7 Area: Impact of animal feed on human health	T5.4.6.6	STREP
	T5.4.7.1	STREP
5.4.8 Area: Environmental health risks	T5.4.8.2	STREP
	T5.4.8.3	STREP
5.5 Specific Support actions	(See Section 5.5 for details)	SSA

²⁹ The call identifier shall be given in the published version of this call.

³⁰ The director-general responsible for the publication of this call may publish it up to one month prior or after its envisaged publication date.

³¹ When the envisaged publication date is advanced or delayed (see previous footnote), closure date(s) will be adjusted accordingly, if needed, in the published call for proposals.

³² IP = Integrated project; NoE = Network of excellence; STREP = Specific targeted research project; CA = Coordination action; SSA = Specific support action.

9. Minimum number of participants:³³

Instrument	Minimum number of participants
STREP and CA	3 independent legal entities from 3 different MS or AS, with at least 2 MS or ACC. Where topics strongly encourage participation of INCO target countries, proposals must include at least one participant from an INCO target country in addition to the minimum participation required.
SSA	1 legal entity from a MS or AS.

10. Restriction on participation: None

11. Consortia agreements: Participants in STREPs, CAs, and SSAs resulting from this call are encouraged, but not required, to conclude a consortium agreement.

12. Evaluation procedure:

- The evaluation shall follow a single stage procedure, which may include a remote evaluation stage.
- Proposals will not be evaluated anonymously.

13. Evaluation criteria: See Annex B of the work programme for the applicable criteria (including their individual weights and thresholds and the overall threshold) per instrument.

14. Indicative evaluation and contractual timetable:

- Evaluation results: estimated to be available within some 4 months after the closure date.
- Contract signature: It is estimated that the first contracts related to this call will come into force before the end of 2006.

³³ MS = Member States of the EU; AS (incl. ACC) = Associated States; ACC = Associated candidate countries. Any legal entity established in a Member State or associated state and which is made up of the requested number of participant may be the sole participant in an indirect action.

II. GENERAL ANNEXES

A) Overview of Calls for Proposals foreseen in this Work Programme (see relevant work programme part for details)

For the latest version of Annex A see the document entitled “Overview of calls for proposals” on the website http://www.cordis.lu/fp6/sp1_wp.htm

B) Common evaluation criteria for evaluating proposals

For the latest version of Annex B see the document entitled “Common evaluation criteria for evaluating proposals” on the website http://www.cordis.lu/fp6/sp1_wp.htm

C) List of Groups of target countries for specific measures in support of International Cooperation

For the latest version of Annex C see the document entitled “List of groups of INCO target countries” on the website http://www.cordis.lu/fp6/sp1_wp.htm