Priority 5: Food Quality and Safety

Workprogramme

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5.2 Introduction

The primary objective of this Thematic Priority is to improve the health and well-being of European citizens through a higher quality of their food, improved control of food production and of 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 the way that food from farming, including fishing and aquaculture, is produced, distributed, and consumed along the various stages of the food production chain and will include consideration of associated environmental factors and their influence on human health.

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 in achieving their aims, as appropriate. Accordingly, integrated research approaches that cross several of the research areas and adopt a "total food chain" approach will be anticipated.

The workprogramme 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 workprogramme and will be valid for all calls for proposals. Under the section "Technical Content", the topics selected for the first call in 2003 are followed by preliminary indications of topics anticipated for 2004.

5.3 Objectives, Structure and Overall Approach

The research areas as described for 2003 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 is based on several inputs such as the analysis of the expressions of interest submitted in 2002. This analysis gave substantial information and guidance on the most immediate and pressing research challenges in the food safety and quality domains. The views and opinions of the Programme Committee, Scientific Advisory Groups, and relevant Commission services have also been taken into account in selecting the appropriate research topics. The specific research topics

for the new instruments of integrated projects and networks of excellence embrace – within a food chain context – human nutrition, 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 the substantial participation of SMEs. Innovation related aspects need to be clearly addressed and well-defined dissemination and exploitation plans presented, showing the optimal use of projects 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 their participation within FP6, a strong mobilisation by all project consortia to include SMEs wherever appropriate must be ensured, in particular in the new instruments.

For proposals submitted to Priority 5 in 2003, there will be only one closing date.

5.4 Technical content

The workprogramme presented below introduces each area and gives a description of the topics for which project proposals are invited. For each topic the Workprogramme specifies whether a new or traditional instrument is to be used.

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 clear health benefits for consumers.

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.

5.4.1.1 Selected topics for 2003

- ***(T1) Food from low input and organic production systems: Ensuring the safety and improving quality along the whole chain – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The objective will be to improve the quality and safety, and to reduce the production costs from foods derived from lower input and organic food production systems. The activities will cover the full chain from consumer to farm. Multi-disciplinary approaches, including farmer participatory research, will be required. Novel procedures and technologies will be developed for improvements in processing,

handling, production, food safety and quality assurance procedures and standards. Research will include extensive surveys and socio-economic analyses of consumer attitudes and expectations, health benefits and the functioning of the food chain. Such research is necessary to ensure that technology development and transfer is based on an accurate and realistic business plan.

- ***(T2) Quality seafood for improved consumer health and well-being – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The objective will be to provide evidence from dietary intervention, epidemiological and toxicological studies concerning the benefits and risks of seafood for human health and well-being. Via comprehensive risk analysis, research will contribute to the development of safe, nutritious and high-quality tailor-made seafood products by addressing the whole chain from farmed and wild fish, including freshwater, to the consumer. This will enable consumer needs and expectations to be identified and met through dietary modulation, husbandry, modern genetic selection, and improved post-harvest technologies using sustainable and environmentally friendly production systems as well as validated traceability systems. The impact of fish feeds and aquaculture production systems on seafood quality and safety and hence consumer health and well-being will be particularly addressed.

- ***(T3) Pathogen free production systems – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

In order to maximise the safety of foods of animal origin, the aim will be to design and test novel approaches for the development of production systems that are as free as possible from human pathogens, for example *Salmonella* and *Listeria*. The systems will take into consideration the maintenance of high levels of animal welfare and the need to reduce, as much as possible, the use of antibiotics.

5.4.1.2 Indicative topics for 2004

- ***(T4) Improving the quality and safety of beef for the consumer – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The aim will be to improve the quality and safety of European beef by identifying those aspects of the production systems that influence quality, impact on consumption or may give rise to societal concerns. Multi-dimensional approaches covering safety, welfare, production and consumer expectations will be preferred.

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.

5.4.2.1 Selected topics for 2003

- ***(T5) Validated food information database for Europe – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE (NE preferred)***

The objective will be to achieve a durable integration of all available food composition data in order to provide a single comprehensive pan-European database based on the harmonisation and extension of European food information systems. After developing and testing a standard for the database entry, the relevant foods, including traditional foods, will be prioritised before they can be integrated into a consistent, readily available information resource. A large range of nutrient and non-nutrient analyses may need to be provided when data are lacking. The database should contain consistently evaluated and documented data on food composition including biologically active compounds as well as references to the analytical methods used in establishing the relevant concentrations. Targeted dissemination of information to food and health scientists, all agrifood industry, stakeholders, consumers and regulatory authorities should be ensured.

- ***(T6) Influence of nutrition and lifestyle on healthy ageing aimed at preventing adult degenerative disease – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

The research will involve epidemiological studies on the influence of diet and lifestyle on healthy ageing, aimed at preventing adult degenerative disease, particularly focusing on cardiovascular diseases and also addressing malnutrition of the elderly.

5.4.2.2 Indicative topics for 2004

- ***(T7) Epidemiology of food allergy – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

Epidemiological studies based on well-defined allergens and well-developed allergy markers will focus on and characterise the prevalence of food allergy in countries not previously studied.

- ***(T8) Influence of gene-nutrient interaction on the development of chronic diseases – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The general objective will be to achieve a better understanding of the influence of food intake and composition on the development of obesity and related diseases, thereby providing the scientific basis for improving health through diet.

- ***(T9) Nutritional and lifestyle habits of adolescents throughout Europe, including production of functional foods with sensory properties attractive to adolescents – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

The research will comprise epidemiological and sociological studies aimed at understanding nutritional and lifestyle habits of adolescents throughout Europe. Dissemination activities promoting positive lifestyle habits, particularly focused on healthy foods will be required.

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 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.

5.4.3.1 Selected topics for 2003

- ***(T10) Functional genomics in relation to food, nutrition and health – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE (NE preferred)***

The objective will be to apply genomics, transcriptomics, proteomics and metabolomics to assess the genetic variation between individuals in relation to nutrient-gene interaction. Expected results include technological platforms for the integration of facilities and databases. This applies in particular to bioinformatics; a nutrigenomics-based nutrition and health education programme for consumers; and dissemination through open conferences, workshops, training courses, and contacts with consumer organisations.

- ***(T11) Lipid metabolism and the metabolic syndrome – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

Routes for the modification of dietary fats affecting risk factors for the metabolic syndrome will be investigated. This will take account of the genotypic variation between individuals in dietary responsiveness via controlled human dietary intervention studies involving measuring a wide range of risk factors and functional biomarkers. Optimised sources and blends of fatty acids (e.g. plants for food and feed, farm animals, fish) that show increased proportions of existing and novel protective unsaturated fatty acids will be developed through genetic engineering, plant breeding, animal nutrition and processing strategies.

- ***(T12) Health risks from heat treated foods and food products – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

The research will explore different hazardous compounds which could be formed by heat treatment and other processing methods of foods, based on international collaboration and including communication issues. Their mechanisms of formation, the development, improvement, validation and harmonisation of methods of analysis, bio-availability, toxicity, biomarkers of exposure and effect as well as exposure assessment will be involved. Reduction and elimination technologies, milder processing conditions and comparative risk assessment studies should also be addressed.

- ***(T13) Food safety, risk assessment and communication – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

Ongoing and emerging food safety and nutritional issues along the food chain will be identified based on an in-depth analysis of national and regional food safety perspectives. The research will aim towards developing risk assessment and communication strategies founded on perceptions of risk assessors and various risk assessment approaches. It will include modelling techniques, empirical studies on how consumers and experts perceive food safety and nutritional issues leading to recommendations for labelling formats, nutritional campaigns and successful communication approaches. Training programmes, technology transfer, and bench

marking will be promoted amongst consumers and stakeholders throughout the food chain.

5.4.3.2 Indicative topics for 2004

- ***(T14) Programming effects of early nutrition on long-term health – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The research should aim at reducing the incidence of chronic diseases, for example cardiovascular diseases, obesity, and diabetes by establishing their origins and predisposition during early life and by introducing early nutritional intervention and aspects of children's diet.

- ***(T15) Microbes, the immune system and gut health – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The objective is to address the scientific basis for the development of foods with specific functions for improving human health and well-being and promoting mental function and for studies on microbes and prebiotics contributing to specific functional health benefits including effects on the human immune system.

- ***(T16) Improving and enhancing the nutritional value and health benefits of cereals – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The objectives are to develop nutritionally optimised cereal foods and new ingredients from cereals. The natural variation, breeding potential, process-induced changes and human metabolism of bioactive compounds derived from cereals will be established and the underlying physiological mechanisms related to human health or disease prevention identified.

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 assure traceability of genetically modified organisms, and other products based on recent biotechnology developments, from raw material origin to purchased food products.

5.4.4.1 Selected topics for 2003

- ***(T17) Development of reliable traceability methods and systems to establish the origin/ mode of production of food products – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The objective will be to address the demand for harmonised, reliable, rapid and cost-effective methodologies and protocols needed to prevent fraud and to assure consumer confidence in the quality and safety of foods. Both product-specific and general traceability systems, e.g. based on natural tracers within the plant or animal product, will be developed in order to assess and guarantee the authenticity and specificity of food products. This will strengthen the traceability research base within Europe and will act as a centre for demonstration, and training of stakeholders involved in this sector. It will also promote exchange of best practice and transfer of knowledge between different food production sectors.

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.

5.4.5.1 Selected topics for 2003

- ***(T18) Prevention and control of zoonoses including food borne diseases – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE (NE preferred)***

The aim is to create a durable integration of key research groups of complementary disciplines, both medical and veterinary, in the field of food safety, particularly focussing on emerging diseases and classical zoonoses (including food borne disease and water-related zoonoses) covering such aspects as epidemiology, pathogenesis, detection and control, and risk assessment. This should support cost effective prevention and control strategies. By taking into account consumer demands and producer requirements, risk assessment approaches will be facilitated.

- ***(T19) Prevention, control and management of prion diseases – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE (NE preferred)***

The aim will be to structure research activities carried out by major laboratories involved in transmissible spongiform encephalopathy research. The joint programme of research activities will focus on prevention, control, treatment and risk analysis of TSEs. It will also include research into diagnostic tests, strain typing methods and new markers identified using proteomic approaches. Research expertise will be integrated, particularly from the areas of epidemiology, pathogenesis, transmission, inactivation and therapeutics. Structuring activities will cover the development of common tools and models, training and exchange of personnel.

- ***(T20) Development of quantitative risk assessment strategies based on probabilistic, genomic and profiling approaches including a risk-benefit evaluation for novel foods – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

The objective will be to develop quantitative risk assessment strategies based on probabilistic and profiling approaches, and on functional genomics. Such approaches

will allow the assessment and analysis of beneficial and adverse effects of novel foods, essential elements of future efforts to communicate meaningful information on benefits, risk, uncertainties and costs to consumers.

5.4.5.2 Indicative topics for 2004

- ***(T21) New approaches towards monitoring and preventing chemical contaminants in food products – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The objective will be to monitor and prevent occurrence of multiple contaminants or mixtures of components such as pesticides, toxins, drugs and endocrine disrupters in foods. This will be achieved by utilising advanced sample preparation techniques and emerging biotechnological screening approaches based on developing novel biomarkers with diagnostic, prognostic characteristics/capabilities and fingerprints thereof. Confirmatory technologies will be improved and developed to support their validation. The research should create cost effective systems to detect contaminants based on recognised criteria. The activities should be linked to extensive demonstration, dissemination and exploitation strategies for various end-users.

- ***(T22) Development of cost effective control and prevention strategies for emerging and future foodborne pathogenic microorganisms throughout the food chain – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The objective will be to reduce the prevalence of newly emerging foodborne pathogens by examining and understanding the factors that enable their establishment and viability throughout the food chain including animal feed, and drinking water and water used for food production. It will build on an improved knowledge of host-pathogen-interaction and will utilise genomic and modelling tools and microarray techniques to predict the occurrence of emerging pathogens.

- ***(T23) Development of cost-effective tools for risk management and traceability systems for zoonotic agents and marine biotoxins in seafood – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

The objective will be to develop cost-effective tools based on HACCP procedures including various modelling approaches, genomics and packaging techniques. Using existing and modified rapid and reliable methods and traceability knowledge will be anticipated.

5.4.6 Area: Safer and environmentally friendly production methods and technologies and healthier foodstuffs

The objective is to develop lower input farming systems (agriculture and aquaculture) based on systems such as integrated production, and organic agriculture. It will emphasise the use of plant and animal genomics, biotechnologies, and other innovative technologies, for improved transformation processes 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. Following the fork-to-farm approach, research on production methods should aim to meet these consumer requirements.

5.4.6.1 Selected topics for 2003

- ***(T24) High throughput analysis of plant composition and metabolism for optimising end-product quality in the plant food chain – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The aims are to improve the health value of crops, using new technologies for a phenotyping platform for plant breeding. A further aim is to facilitate the analysis of substantial equivalence. Using species chosen from the major European food crops this research will develop; a set of core technologies for profiling and identifying all plant metabolites implicated in human health and disease; elucidate the biosynthetic pathways of the metabolites and their metabolism in the human body; identify useful plant molecular markers and genes and investigate effects on the content of these metabolites of growing conditions, storage, transport and processing. In addition to the necessary skills in genomics and post genomics, in human medicine, nutrition and toxicology, teams should include expertise in sociology, economics, policy, and communication. A plant-food health bioinformatics portal should be created for improved dissemination and interaction. Emphasis is placed on the importance of interpreting and diffusing research results and promoting rational consumer choice.

- ***(T25) Improved strategies in animal welfare for improved food quality – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The objective will be the integration of European research groups with the aim of building on European strength in the field of animal welfare and, ultimately, of improving production methods (such as the definition of improved housing, husbandry and slaughter protocols) that take into account consumer demands for high standards of animal welfare, health and food quality. New knowledge will be generated on objective indicators of welfare status, novel methods of ameliorating welfare problems while improving food quality and safety and on addressing consumer perceptions and concerns. Integration will be addressed by linking together a wide range of stakeholders and will stimulate a science-society dialogue on welfare issues in farming through educational initiatives and information platforms.

- ***(T26) Genomics of host-pathogen interactions in animals – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE (NE preferred)***

The objective will be the durable integration of research groups involved in functional animal genomics. A common technological platform will promote the use of genomic tools to clarify the mechanisms of the interactions between the host (of all livestock species, including those used in aquaculture) and pathogen (including bacteria, viruses, parasites and prions). The research will concentrate on diseases (including zoonoses) of livestock (including aquaculture), but will also include comparative studies relevant to human host-pathogen interactions. The joint plan of activities will also provide the link between genomics and the production of resources that will make a real difference to animal and human health, as well as improving the quality of animal products.

- ***(T27) Improved crop protection systems based on biological control methods for safer low input production systems – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

The aim will be to develop safer and high quality foods through improving crop protection systems based on biological control agents and/ or semiochemicals for the

control of pests, diseases and weeds in food crops. The work will harmonise methodologies for monitoring the effectiveness of existing and new biological control agents and of semiochemicals. Special emphasis will be placed on short- and long-term effects of such methods on food safety and quality and on risk assessment for non-target organisms and the environment. The results will include an economic appraisal of these strategies from production to application, and quality standards for their production and use.

- ***(T28) Antibiotic resistance in animals, plants and humans – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

The aim will be to co-ordinate the critical evaluation of the role of antibiotic use in animal and plant production and in the prophylaxis and treatment of disease in humans, on the level of antibiotic resistance in bacteria. In particular, it will assess the importance of the transfer of resistance to microorganisms in humans from where this resistance is thought to have first occurred through the use of antibiotics in animals, plants or other humans.

- ***(T29) Disease risk from alternative and enriched cage and free-range systems – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

The aim will be to evaluate the risk of increased contamination of eggs, increased disease in farmers (e.g. respiratory disease) and other potential disease risks resulting from a move to more welfare-friendly egg production systems that will replace the classical, un-enriched battery cage. Classical cages are due to be phased out in 2012 and it is important to understand any potential risks of this move on human health.

- ***(T30) Simulation modelling for improved crop establishment in low input systems – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

The aim will be to produce safer, high quality food from more environmentally friendly production methods through improvements in weed control and the use of fertiliser and water in integrated and organic agriculture, especially during the critical phases of crop establishment. By developing comprehensive computer models of seedling and weed establishment, as well as of soil, water and nutrient dynamics, and by scenario testing and experiments, new knowledge will be derived and implemented.

5.4.6.2 Indicative topics for 2004

- ***(T31) Soil microbial community management for safe production under biotic and environmental stress conditions – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The objective will be to improve food safety and quality by developing new cropping systems to promote low-input agriculture in less favoured regions and under difficult environmental conditions.

- ***(T32) Exploitation of plant biodiversity to reduce pesticide application for disease control – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The outcome will be the development of disease resistant plants that will lead to a decrease in the use of plant protection products and the associated risks for human health and the environment.

- ***(T33) Generic platform to improve the immunological basis for protection against animal disease – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

This will form an important base for the development of improved vaccines against livestock disease, including zoonoses, by providing an improved immunological setting for future vaccine production.

- ***(T34) Plant flavonoids and their impact on food quality, nutrition and health – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

The goal of the research will be to study the biosynthesis, genetics, natural variation, the effect of plant growth environment, agronomic practices and food processing on the composition and concentration of plant flavonoids in food crops and their role in human health.

- ***(T35) Recycled organic wastes from the food chain in environmentally friendly healthy food production – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

The overall objective will be to increase the utilisation and sustainable management of organic wastes from food production and processing while contributing to improved food quality and safety and reducing the environmental impact of the waste. New commercial opportunities resulting from innovative high-added value applications of recycled/reused by-products shall be promoted.

- ***(T36) Sustainable aquaculture for a high-quality and safe product – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

The objective will be to develop a platform providing protocols for sustainable, ethical, safe, and high quality products from aquacultural production systems.

- ***(T37) GMO co-existence analysis – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

The aim is to improve understanding of the factors that are important in the coexistence of GM crops with other farming systems by coordinating relevant ongoing work on: fitness of GM crop plants and their progeny, biological and mechanical aspects of reducing GM adventives below the 0.1% threshold, rapid and accurate methods to monitor low levels of GM adventives in seeds or crops, and statistical work on most probable number, socio-economic and geographic impact assessments.

- ***(T38) Use of genetic resistance as a tool to control plant pathogenic viruses – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

The aim is to co-ordinate relevant work ongoing on the sources, mechanisms and durability of genetic resistance to plant viruses, the use of genetically engineered resistance and the resistance management in different production systems resulting in reduced pesticide usage.

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.

5.4.7.1 Selected topics for 2003

- ***(T39) New strategies to improve grain legumes for food and feed – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

Grain legumes can provide high quality plant proteins for animal feed and human food, but at present they are underused. The genetic improvement of grain legumes requires work on optimising feed to meet the nutritional requirements of livestock, on the reduction of mycotoxins, and on dietary intervention (including legumes as components of functional foods), toxicology, and risk analysis in human health. In addition, a particular effort is required in plant breeding, including genetic engineering. To identify genes and alleles that contribute to the desired traits, the most recent developments, such as "t.i.l.l.in.g." (targeting induced local lesions in genomes) should be deployed. Thus a multidisciplinary approach is essential, with contributions from biochemistry, from plant and crop physiology and agronomy, plant genomics and breeding, and from human nutrition and health.

- ***(T40) Alternatives to antimicrobials in feeds – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

This research will examine the potential of using plant extracts and other natural substances not considered harmful for human or animal health, as alternatives to antimicrobials, including antibiotics, used as prophylactic and growth promoting agents in livestock. It will aim to produce definitive platforms for the rational production of useful products and to link together current research groups working in this field.

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.

5.4.8.1 Selected topics for 2003

- ***(T41) Human health implications of exposure to chemical residues in the environment – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

Research will focus on novel or improved analytical techniques for the measurement of inorganic and organic chemical residues, radioactive isotopes and pharmaceuticals in food, water, and the environmental sources linked to the food chain; improved assessment of health effects on humans, in particular sensitive groups. Emphasis will be placed on low dose exposure and non-linear dose response relationships. Harmonisation of the capacities in exposure research should be included in order to produce a series of validated and integrated predictive models for use in assessment frameworks for regulatory risks and for the control of chemical exposure to human.

- ***(T42) Allergy and asthma – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The objective will be the durable integration of experimental and clinical research groups in the field of allergy. Important fields for research coordination are the role of the foeto-maternal interface and early life events in the development of allergies; environment including outdoor and indoor pollution; food; lifestyle; infections; and genetic susceptibility. New knowledge will be gained on genetic polymorphisms and susceptibility biomarkers, novel diagnostic tests, and novel treatment based on a sound understanding of the environmental and molecular mechanisms of allergy. Integration will occur through electronic communication, creation of common databases to monitor new trends and to optimise the dissemination of knowledge, developing and harmonising guidelines, carrying out multicentre, multidisciplinary studies on diagnostics and therapeutics, and through training.

- ***(T43) Neurotoxic effects of environmental contaminants – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

Research will aim at developing and providing methods, procedures, and models to detect and characterise environmental factors contaminating food (e.g. persistent organic pollutants and pesticide residues) affecting neuro-endocrine control systems in humans and animals. Special emphasis will be given to neurobehavioural development and neurodegenerative disease. The focus will be on interdisciplinary research approaches engaging neurologists, endocrinologists, (eco)toxicologists, pharmacologists and other relevant specialists.

- ***(T44) Effects of environmental exposure to complex chemical mixtures – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

Research will focus on gathering evidence of possible links between combined chemicals exposure related to the food chain and human health effects, including mechanisms, with emphasis on cancers and other chronic diseases and various vulnerable subgroups of the population. Where relevant, effect markers and diagnostic tests will be developed allowing individualised assessment of risks in humans.

5.4.8.2 Indicative topics for 2004

- ***(T45) Environmental factors influencing puberty onset – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The aim will be to identify factors playing a role in the development of precocious puberty. Research will focus on the role of the environment, diet, and endocrine disrupting chemicals on puberty development.

- ***(T46) Cancer risk correlated to environment, diet and genetic factors – INTEGRATED PROJECT OR NETWORK OF EXCELLENCE***

The overall objective will be to verify the usefulness of existing as well as to develop novel biomarkers and bioindicators for assessing environmental cancer risk by classical and molecular epidemiology, taking into account modulating effects of diet, smoking, alcohol consumption and individual susceptibility.

- ***(T47) Food and fertility – SPECIFIC TARGETED RESEARCH PROJECT OR COORDINATION ACTION***

Research will focus on examining the role of chemicals contaminating the environment and food, such as pharmaceutical residues on human fertility.

5.5 Specific Support Actions

In this Thematic Priority emphasis will be placed on Specific Support Actions with the following objectives:

- Realising ERA objectives
- Promotion of SME participation
- Stimulating international co-operation
- Linking with Candidate Countries
- Supporting policy development
- Stimulating exploitation
- Contributing to the EU Strategy for Life Sciences and Biotechnology: Specific Support Actions will be funded as necessary to implement any of the thirty actions listed in the Action Plan attached to COM(2002)27. Particular attention will be paid to support those actions relating to the resource base: investing in education and training, research, exploitation of intellectual property, the capital base and networks in Europe; to Governing Life Sciences and Biotechnology: social scrutiny and dialogue, consideration of ethical values and societal goals and to those actions relating to the European response to Global Challenges: international collaborations, biotechnology and the developing world.

5.6 Links to other Research Topics

Fundamental knowledge in genomics (including human/ animal/ plant) is covered by the first priority, as well as its applications to human health. 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 priority or covered, as appropriate, by policy oriented research. This includes the common agricultural policy (CAP) and the common fisheries policy (CFP) as well as Community policies related to health and environment.

5.7 Implementation Plan and Related Issues

The selected topics will be open only for the call indicated. In addition, some topics may not be supported.

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

Instrument	Number of participants	Indicative budget per group of instruments
Integrated Projects	See general Rules for Participation	128 M€
Networks of Excellence	See general Rules for Participation	
Specific Targeted Research Projects	See general Rules for Participation	32 M€
Co-ordination Activities	See general Rules for Participation	
Specific Support Actions	See general Rules for Participation	7 M€

ROADMAP – Thematic priority 5 "Food quality and safety"

Type of Activity		Indicative budget Date of publication in OJ: *[date]*				Type of instrument Open in each call
Focussing and integrating Community research		Deadline for submitting proposals				**IP** – integrated project **NE** – network of excellence **STREP** – specific targeted research project **CA** – coordination action **SSA** – specific support action
Thematic Priority	**Area**	**April 2003**	**February 2004**	**January 2005**	**December 2005**	
5. Food quality and safety	Total food chain	€167M	€161.7M	€160M	€160M	IP, NE, 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					

5.8 Call Information

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**: [1]
5. **Date of publication**[2]: 17 December 2002.
6. **Closure date(s)**[3]: 15 April 2003 at 17.00 (Brussels local time).
7. **Total indicative budget**: 167 Million €, broken down as follows

Instrument[4]	EUR (millions)
IP and NOE	128
STREP and CA	32
SSA	7

8. **Areas called and Instruments**:

Area	Topic	Instrument
5.4.1 Area: Total food chain	T1	IP or NOE
	T2	IP or NOE
	T3	STREP or CA
5.4.2 Area: Epidemiology of food-related diseases and allergies	T5	IP or NOE (NOE preferred)
	T6	STREP or CA

[1] The call identifier shall be given in the published version of this call.
[2] The director-general responsible for the publication of this call may publish it up to one month prior or after its envisaged publication date.
[3] When the envisaged publication date is advanced or delayed (see previous footnote), closure date(s) will be adjusted accordingly in the published call for proposals.
[4] IP = Integrated project; NOE = Network of excellence; STREP = Specific targeted research project; CA = Coordination action; SSA = Specific support action

5.4.3 Area: Impact of food on health	T10	IP or NOE (NOE preferred)
	T11	IP or NOE
	T12	STREP or CA
	T13	IP or NOE
5.4.4 Area: "Traceability" processes along the production chain	T17	IP or NOE
5.4.5 Area: Methods of analysis, detection and control	T18	IP or NOE (NOE preferred)
	T19	IP or NOE (NOE preferred)
	T20	STREP or CA
5.4.6 Area: Safer and environmentally friendly production methods and technologies and healthier foodstuffs	T24	IP or NOE
	T25	IP or NOE
	T26	IP or NOE (NOE preferred)
	T27	STREP or CA
	T28	STREP or CA
	T29	STREP or CA
	T30	STREP or CA
5.4.7 Area: Impact of animal feed on human health	T39	IP or NOE
	T40	STREP or CA
5.4.8 Area: Environmental health risks	T41	IP or NOE
	T42	IP or NOE
	T43	STREP or CA
	T44	STREP or CA
5.5 Specific Support Activities	(See Section 5.5 for details)	SSA

9. Minimum number of participants[5]:

Instrument	Minimum number of particpants
IP, NOE, STREP and CA	3 independent legal entities from 3 different MS or AS, with at least 2 MS or ACC.
SSA	legal entity from a MS or AS

10. Restriction on participation: None.

11. Consortia agreements:

- Participants in IP and NOE are required to conclude a consortium agreement.
- Participants in STREP, CA, and SSA 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

[5] 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.

- 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 2003.