Domain: FOOD AND AGRICULTURE

The Domain Food and Agriculture covers all aspects of research in the field of agricultural and food sciences in its widest sense. This naturally encompasses a very wide number of subjects, and relates to a large number of areas of human activity. The primary aim of the Domain is to encourage networking of research in any field linked to these activities as well as the related demands and needs. The following examples illustrate aspects of actual research in this Domain. It is emphasized that they are examples, not a complete catalogue. The Domain actively seeks innovative and interesting proposals even if they may not at first sight fit neatly into a traditional category of research in food and agriculture.

The Biological Functions of Organisms: to advance understanding of the functions of organisms relevant to agriculture, food and nutrition, the domain will welcome proposals where fundamental science is an essential component of the topic. This will include biological science, animal science, veterinary science, plant science, microbiological science, soil science, genetics and breeding, agricultural system science or any other fundamental discipline related to food, agriculture & fisheries. Biotechnology - the use of the most recent techniques and applications that spring from their use - is also addressed.

Human Nutrition and the Food Chain covers the entire food chain leading to non-processed, semi-processed and processed foods and encompasses food and feed quality, food safety, functional foods, nutritional and consumer issues. It includes all the processes and techniques used in food technology that are needed to bring food to the consumer's fork.
Agriculture as a Human Activity: the domain addresses socio-economic aspects of food and agriculture and other relevant concerns, such as the relationships between agriculture, rural economy and rural development. Societal issues concerned with animal health (disease prevention in animals and people) and animal welfare are also included.

Agriculture and Environment: this relationship is also addressed by the domain. It includes issues such as sustainability, natural resources and conservation, biodiversity and genetic resources, biosafety, bioremediation, and bioenergy. Proposals may also address changes in European agriculture under the influence of major issues such as reform of the Common Agricultural Policy, global warming, world trade patterns and energy scarcity.

Since food and agriculture involve so many scientific disciplines, it is anticipated that successful proposals will vary widely in nature from closely focussed topics of a fundamental nature using the most innovative and up-to-date techniques (such as tools for genomics, proteomics and metabolomics) to multidisciplinary projects having a more holistic approach (such as new farming systems for the production of quality food).

Action 862: Bacterial Toxins for Insect Control

Entry into force : 21/01/2005
End of Action : 16/02/2010

The **main objective** of the Action is to increase the availability of new and improved bacterial antagonists and their toxins for use in biological control of insects in conventional and organic agriculture that will create economic value to the biocontrol industry and the growers.

More information can be obtained through the website:
http://www.cost862.com

or by contacting the Chair of the Action:
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Action 863: Euroberry research: from genomics to sustainable production, quality & health

2005 - 2010
Chair: Pr Bruno MEZZETTI (IT)

Berry production is an economically significant part of agriculture in most European countries. The main objective of the Action is to improve the quality and production of berries to benefit the health of the consumers and maintain profitable European production using sustainable systems.

More information can be obtained through the website:
http://www.euroberry.it/

or by contacting the Chair of the Action:
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Action 864: Combining traditional and advanced strategies for plant protection in pome fruit growing

2006 - 2011
Chair: Pr Karl STICH (AT)

The **main objective** of the Action is to increase the knowledge on the plant-biology involved in pome fruit health by establishing a network of scientists dealing with pome fruit growing and by creating an interface between basic and applied science for disease and pest management. The research topics will focus on plant-pathogen-interactions, germplasm-resources and breeding, production methods, and biotechnological approaches.

More information can be obtained through the website:
http://www.cost864.eu/

or by contacting the Chair of the Action:
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Action 866: Green care in agriculture

2006 - 2010
Chair: Pr Bjarne BRAASTAD (NO)

The **main objective** of the Action is to increase the scientific knowledge on the best practices for implementing green care in agriculture with the aim of improving human mental and physical health and the quality of life.

More information can be obtained through the website:
http://www.umb.no/greencare

or by contacting the Chair of the Action:
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Action 867: Welfare of fish in european aquaculture

2006 - 2011
Chair: Pr Anders KIESSLING (NO)

The **main objective** of the Action is to improve the knowledge on welfare of fish and formulate a set of guidelines embodying a common and scientifically sound understanding of the concept of welfare in farmed fish and to construct a range of targeted operational welfare indicator protocols to be used in the industry.

More information can be obtained through the website:
http://www.fishwelfare.com

or by contacting the Chair of the Action:
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Action 868: Biotechnical functionalisation of renewable polymeric materials

2006 - 2010
Chair: Pr Georg GÜBITZ (AT)

The main objective of the Action is to generate a synergistic approach for utilisation and upgrading of different biomaterials; to assess the potential of enzymes for surface functionalisation as well as the production of recombinant biopolymers with special functions and together with advanced and sustainable clean processing technologies generate new added-value polymer products with a broad application range.

More information can be obtained through the website:
http://www.cost868.TUGraz.at

or by contacting the Chair of the Action:
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Action 869: Mitigation options for nutrient reduction in surface water and groundwaters

2006 - 2011
Chair: Dr Wim CHARDON (NL)

The **main objective** of the Action is to undertake a scientific evaluation of the suitability and cost-effectiveness of different options for reducing nutrient loss to surface and groundwaters at the river basin scale, including their limitations in terms of applicability under different climatic, ecological and geographical conditions.

More information can be obtained through the website:
http://www.cost869.alterra.nl

or by contacting the Chair of the Action:
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Action 870: From production to application of arbuscular mycorrhizal fungi in agricultural systems: a multidisciplinary approach

2007 - 2011 Chair: Dr. Jacqueline BAAR

The Action takes a multidisciplinary approach to increase the knowledge needed for implementation of arbuscular mycorrhizal fungi in agricultural systems, in order to reduce agricultural inputs and reduce losses to the environment.

More information can be obtained through the website:
http://www.cost870.eu/

or by contacting the Chair of the Action:
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Action 871: Cryopreservation of crop species in Europe

2006 - 2010
Chair: Dr Bart PANIS (BE)

The Action wants to improve and apply technologically advanced techniques for plant genetic resources conservation of crops that are grown and/or conserved in Europe with the main emphasis on long-term conservation through cryopreservation.

More information can be obtained through the website:
http://www.biw.kuleuven.be/dtp/tro/cost8

or by contacting the Chair of the Action:
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Action 872: Exploiting genomics to understand plant-nematode interactions

2006 - 2010
Chair: Dr John JONES (UK)

The **main objective** of the Action is to develop a coordinated approach to exploitation of genomics information that is appearing for plant parasitic nematodes and host crops.

More information can be obtained through the website:
http://cost872.scri.ac.uk

or by contacting the Chair of the Action:
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Action 873: Bacterial diseases of stone fruits and nuts

2006 - 2011
Chair: Dr Brion DUFFY (CH)

The Action aims at developing strategies to prevent biological invasion and spread of bacterial diseases of stone fruits and nuts that will be used for the design of integrated approaches for plant health management.

More information can be obtained through the website:
http://www.cost873.ch

or by contacting the Chair of the Action:
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Action 928: Control and exploitation of enzymes for added-value food products

2006 - 2010
Chair: Pr Johanna BUCHERT (FI)

The **main objective** of the Action is to develop tailored bioprocessing technologies for especially cereal, berry, fruit and vegetable and proteinaceous (dairy, meat, fish) food raw materials in order to obtain higher quality food products.

More information can be obtained through the website:
http://virtual.vtt.fi/virtual/cost928

or by contacting the Chair of the Action:
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Action 929 - A European network for environmental and food virology

2006 - 2010
Chair: Dr Nigel COOK (UK)

The Action wants to construct a network of expert European scientists, who will cooperate to promote the study of, and to tackle the issues associated with, food- and environmentally transmitted pathogenic viruses.

More information can be obtained through the website:
http://www.cost929-environet.org

or by contacting the Chair of the Action:
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Action FA0601 - Fish reproduction and fisheries

2007 - 2011 Chair: Dr. Francisco SABORIDO REY

Most of the European marine fish resources are overexploited. Despite the technical measures implemented, many depleted stocks have failed to recover. There is increasing awareness that the

traditional indicators of stock viability are inadequate because the capacity of the population to annually produce viable eggs and larvae is extremely important for stock viability and recovery. In addition, egg production is also influenced by ambient environmental conditions, the exact effects of which are still not quantified. Currently there are a number of research projects specifically examining the linkages between fish reproductive success and the subsequent population dynamics. In addition to these projects there is a need for increased cooperation between researchers, standardisation and cross calibration of the different protocols being used, enhanced exchange of ideas, demonstration of the latest advances and the creation of a common research platform that can provide fisheries managers with realistic tools for fish stock recovery. The main objective of the Action is to establish a network of researchers to co-operate on the improvement of knowledge on fish reproduction in relation to fisheries and the enhancement of the current assessment methodology in order to promote sustainable exploitation of marine fish resources.

More information can be obtained by contacting the Chair of the Action:
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Action FA0602: Bioactive food components, mitochondrial function and health

2007 - 2011 Chair: Dr. Jaap KEIJER

Good functional mitochondria are essential for a healthy organism and dysfunction leads to disease. The performance of mitochondria can be influenced by diet and dietary components. This provides opportunities for the improvement of human health and represents development opportunities for the food industry and science. Despite its importance world-wide, research in this area is extremely limited. This COST action will set up a structure to bring the mitochondrial research community and the nutrition research community together and build an integrated European research community aimed at understanding the interdependency between bioactive food components and mitochondrial function. Better understanding of this interaction may lead to important economic and social benefits by improving health, boosting industrial innovation and sustaining European competitiveness in this field.

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Signatories: new Action (signatures in progress)

Action FA0603: Plant proteomics in Europe (EUPP)

2007 - 2011 Chair: Dr. Jenny RENAUT

Plants, as all other living organisms depend on proteins to perform most of their vital functions. The name protein comes from the Greek πρώτα ("prota"), meaning "of primary importance". Proteins are the functional molecules that drive metabolic and regulatory pathways in a cell. Proteomics, i.e. the large-scale analysis of proteins in biological systems at a certain time point, aims to identify all proteins present and to characterize their qualitative and quantitative modifications, for example in response to environmental changes. Proteomics is a relatively recent technology currently undergoing fast development and growth, logically complementing the genomic and transcriptomic studies as well as the other emerging field of metabolomics. Although protocols have been developed to perform proteomic analysis in the human, animal and microbial domains of life, the plant kingdom still awaits a systematic approach for proteome analysis. This proposal aims to build up expertise in plant proteomics through an integrated network of European scientists. Tools for proteome analysis in fundamental and applied plant research areas will be developed and shared, to generate fundamental information about plant metabolism, investigate responses to environmental constraints and assess food quality. This proposal will also increase public understanding for new technologies, critical for further development by the industry.

More information can be obtained through the website:
http://www.costfa0603.eu

or by contacting the Chair of the Action:
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Action FA0604: Triticeace genomics for the advancement of essential European crops (TritiGen)

2007 - 2011 Chair: Professor Alan SCHULMAN

Europe faces the challenge of delivering safe, high-quality, and health-promoting food and feed as well as bio-products in an economical, environmentally sensitive, and sustainable manner across environments that face climatic change and increasing abiotic and biotic stresses. Triticeae cereals (wheat, barley, rye) are essential in human and domestic animal nutrition and are arguably the most important crops for European agriculture. Existing germplasm resources and current breeding methods alone are insufficient for understanding the mechanisms underlying important traits and for catalysing a quantum leap in yield, sustainability and quality improvement. Major advances in crops will require a broad suite of direct genomics approaches, built on relevant data from model plants (rice, Brachypodium). Such a strategy is massively complex and can only be carried out efficiently at the international level. The four Working Groups will arrange workshops, Short Term Scientific Missions, a website, and joint databases and publications.

More information can be obtained by contacting the Chair of the Action:
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Action FA0605: Signaling control of stress tolerance and production of stress protective compounds in plants

2007 - 2011 Chair:

Unravelling signalling steps and metabolic pathways controlling abiotic stress tolerance of plants, provides essential tools for coping with the accumulating negative effects of climate changes in breeding, agriculture and environmental protection. Improvement of efficacy of plant stress tolerance is essential for successful combating salinization, frost damage and desertification in European and also in other non-COST participating countries. Drought, salt and cold tolerance traits of crops are controlled by biological regulatory mechanisms governing the production of highly effective stress-protecting metabolites, including polyamines and proline. The major goal of this Action is to stimulate cutting-edge collaborative research towards understanding the regulatory mechanisms of abiotic stress signalling pathways leading to the production of major stress-protective plant compounds. By stimulating scientific exchange among molecular geneticists, biochemists, plant physiologists and breeders, the network program aims at the identification of key regulators of plant abiotic stress responses and their essential stress-protective end-targets.

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