

NUTRITION, FOOD AND HEALTH



Academy of Finland
Research Programme
ELVIRA 2006–2010

2006 - 2010

ELVIRA



ACADEMY OF FINLAND
RESEARCH FUNDING AND EXPERTISE

RESEARCH PROGRAMME ON NUTRITION, FOOD AND HEALTH 2006–2010



ELVIRA IN BRIEF

The ELVIRA research programme creates new knowledge aiming at significant societal and economical impacts. The underlying theme is health: how good health and well-being can be created and maintained with good nutrition; how tasteful foods supporting health-promoting nutrition can be developed and made better available; how consumers can be guided to choose wisely from a large food selection; and how this food selection can meet all the safety requirements.

A CHALLENGE OF HEALTHY NUTRITION

Nutrition affects all physiological processes important to maintaining human health. Therefore, nutrition is one of the key factors in the promotion of a healthy life and in the prevention of diseases. According to the National Nutrition Council of Finland, the most alarming nutritional problem currently facing Finns is obesity, which is common in all age groups. Obesity, in turn, is a strong risk factor for many diseases of major public health importance, including type 2 diabetes, coronary heart disease, hypertension, some forms of cancer, and musculoskeletal disorders.

The prevention of health problems costs much less than the treatment of diseases. Therefore, research directed at understanding the links between diet and health that helps to develop effective interventions and to especially find ways to change people's

lifestyles will have an important impact on nutrition and society in Finland.

The food industry is the largest industry sector in Europe and the fourth largest in Finland. As an employer the food industry is the third largest of all Finnish industry sectors. Success in global competition requires enhanced productivity and focus on innovative, knowledge-based and high-quality products. Healthy nutrition is a key competence factor for food industry. The development of innovative food products is not possible without strong high-level basic and applied research and active cooperation between different actors.

MULTIDISCIPLINARY COOPERATION

The multidisciplinary research programme covers almost the whole food chain from natural or



OBJECTIVES OF THE PROGRAMME

The main objectives of the research programme are:

- to create new knowledge aiming at significant societal and economical impacts, in addition to scientific impacts
- to establish new collaborative networks across disciplinary boundaries and within and among research institutions
- to reinforce cooperation and knowledge transfer between the scientific community, large and small enterprises and public authorities
- to promote researcher mobility
- to support the balanced structure of research teams, and especially increase the proportion of postdoctoral researchers.


Additional objectives include:

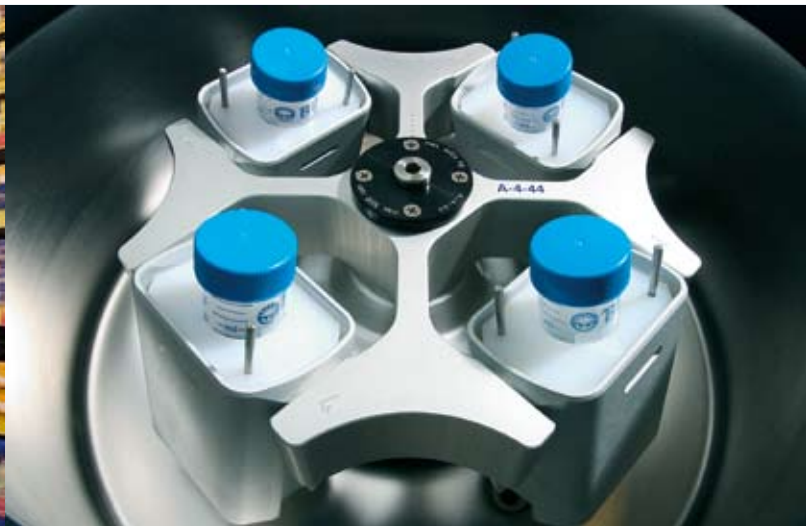
- to maintain and develop the current strengths of research and boost the areas that need further development
- to promote efficient training of researchers both in academia and industry
- to further strengthen the international competitiveness of Finnish research
- to develop an optimal environment for food, nutrition and health-related research
- to disseminate information on research results and to meet the information needs of society on a healthy, safe and balanced diet.

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Yliopistopaino, Helsinki 2007





agricultural products to processing and products in the food industry, and their safety and health impacts, as well as various issues related to consumer behaviour.

ELVIRA includes the following research themes:

- Consumer behaviour, lifespan and health
- Nutrition, genetic factors and metabolism
- Food, immunity, intestinal microbes and health
- Food-related risks and food safety
- Food processing and health

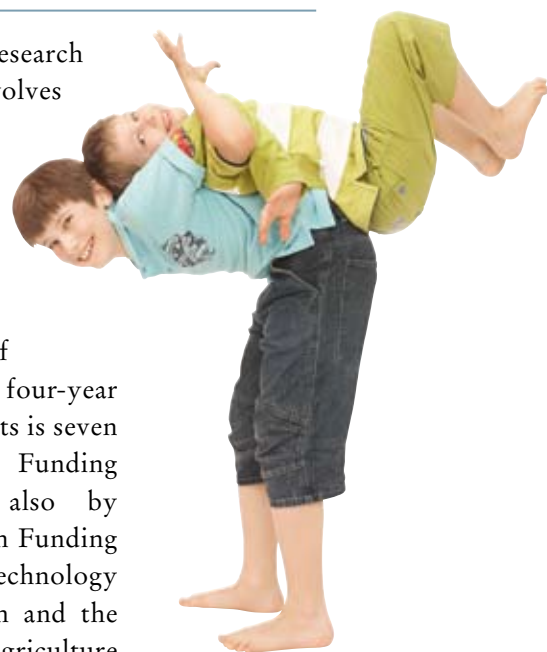
The outcome of the research should be instrumental to the public benefit and the development of the Finnish food industry.

“High-quality and innovative research that in the long run helps consumers to make healthy and safe food choices”

FUNDING

The ELVIRA research programme involves 15 multi-disciplinary research projects.

The funding of the Academy of Finland for the four-year research projects is seven million euros. Funding is provided also by Tekes – Finnish Funding Agency for Technology and Innovation and the Ministry of Agriculture and Forestry.





ELVIRA RESEARCH PROGRAMME

FUNDED PROJECTS

Analysis of Psychrotrophic Specific Spoilage Microbial Communities in Packaged Meat Products by Metagenomics and Culture-dependent Approaches
Johanna Björkroth, University of Helsinki
Petri Auvinen, University of Helsinki

Aqueous Processing of Oats and Barley:
In situ Enhancement of Folate and Associated Bioactive Compounds while Maintaining Soluble Dietary Fibre Physiologically Active
Vieno Piironen, University of Helsinki
Matti Korhola, University of Helsinki
Hannu Salovaara, University of Helsinki

Augmentation of Immune Responses against Hepatitis C Virus by Probiotic Bacteria
Hannu Mykkänen, University of Kuopio

Eating Patterns among Conscripts in the Finnish Defence Forces: Exploring Formation of Food Choices and Intervening to Promote Healthy Lifestyle
Antti Uutela, National Public Health Institute
Antti Häkkinen, University of Helsinki
Harri Pihlajamäki, Centre for Military Medicine

Effectiveness and Feasibility of Activating Counselling Methods and Videoconferences in the Dietary Group Counselling of Subjects with a High Risk of Type 2 Diabetes
Jaana Laitinen, Finnish Institute of Occupational Health

Dietary, Lifestyle, and Genetic Determinants of Obesity and Metabolic Syndrome
Pekka Jousilahti, National Public Health Institute
Johan Eriksson, National Public Health Institute
Ari Haukkala, University of Helsinki
Leena Peltonen-Palotie, University of Helsinki

From Genomes to Probiotic Functions: Stripping *Lactobacillus rhamnosus* Using Expression Proteomics, Host Interactomics and Immunoproteomics
Nisse Kalkkinen, University of Helsinki
Tapani Alatossava, University of Helsinki
Pekka Varmanen, University of Helsinki

From Secretome to Interactome:
 Molecular Analysis of Probiotic Mechanisms of *Lactobacillus rhamnosus* GG (LGG)
Airi Palva, University of Helsinki
Seppo Salminen, University of Turku
Willem de Vos, Wageningen University

Gene-Diet Interactions in the Development of Atherosclerosis and Osteoporosis
Olli Raitakari, Turku University Hospital
Mika Kähönen, University of Tampere
Terho Lehtimäki, University of Tampere
Leena Räsänen, University of Helsinki

Infections Caused by Foodborne Bacteria – Retrospective Study on Association of Morbidity and Mortality of Finns, Prospective Study on Tracing of Domestic Cases and Risk Assessment
Anja Siitonen, National Public Health Institute
Markku Kuusi, National Public Health Institute
Sinikka Pelkonen, Finnish Food Safety Authority
Pirkko Tuominen, Finnish Food Safety Authority

Management of Gluten Intolerance: Novel Insights in Occurrence, Immunogenetics, Food Processing and Safety
Markku Mäki, University of Tampere,
Juha Kere, University of Helsinki
Pekka Männistö, University of Helsinki
Hannu Salovaara, University of Helsinki

Structure Engineering Concepts for Light Products
Raija Lantto, VTT Technical Research Centre of Finland
Maija Tenkanen, University of Helsinki

Systems Biology Approach to Understand Dietary Modulation of Gene Expression and Metabolic Pathways in Subjects with Abnormal Glucose Metabolism
Matti Uusitupa, University of Kuopio
Matej Orešič, VTT Technical Research Centre of Finland

Tailored Engineering of Dairy-based Protein Polymer Structures and Effects on Satiety Signals
Karin Autio, VTT Technical Research Centre of Finland
Karl-Heinz Herzig, University of Oulu
Leila Karhunen, University of Kuopio

Understanding Pathogenicity, Epidemiology and Antimicrobial Resistance of *Campylobacter jejuni* and *coli*, Significant Foodborne Pathogens
Marja-Liisa Hänninen, University of Helsinki
Hilpi Rautelin, University of Helsinki

FURTHER INFORMATION

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