

FOODINTER

Food interactions : effects on health, consumer perception and impact on agro-food industries

DURATION OF THE PROJECT

Phase 1: 01/01/2007 – 31/01/2009
Phase 2: 01/02/2009 – 31/01/2011

BUDGET

720.706 €

KEYWORDS

Food Safety, Endocrine disruptors, mycotoxins, novel foods, chemical risk, cell-based assays, risk perception

CONTEXT

Nowadays, we are moving towards an increasingly complex food chain and consumer habits are changing dramatically. In this context, dietary supplements (e.g. vitamins, amino acids, anti-oxidants), para-pharmacy products, and functional food (e.g. phytosterols or omega-3 fatty acids enriched food) are of increasing interest. These products lie between food and drugs. Moreover, interactions between active substances and other compounds (drugs, contaminants, food constituents) are poorly documented. Therefore, food safety issues become even more complex than ever. In addition, it is necessary to study how new consumption habits are evolving. Aspects such as information, risk perception, and communication to the authorities, agro-food companies, health professionals and consumers will be considered.

WP 3: risk assessment and communication (ULg and CERVA-CODA)

Interactions between scientists and stakeholders (and more largely society) is a condition of credibility and efficiency. In the field of food consumption, this objective is important because food safety depends not only on production and control, but also on consumption practices and good information must therefore be promoted. One important aspect is the definition of risks: we assume that risks linked to contaminants and interactions between food, functional food, dietary supplements and para-pharmaceuticals are poorly integrated by consumers. An originality of this project is to build a specific setting to develop dialog between scientists and stakeholders. Agro-food industry is one among the important stakeholders: representatives of food industry have to be interviewed to describe the ways they treat these risks. Citizens also need to be consulted using specific protocols.

PROJECT DESCRIPTION

Objectives

The objective of this project is to contribute to the risk assessment linked to the consumption of dietary supplements, para-pharmacy products and functional foods. Interactions between active substances, natural compounds, transformation products, environmental contaminants, will be studied at the intestinal level. Taking into account new consumers' habits, the project will focus on the impact of these interactions on human health. It will increase knowledge and fill some gaps regarding health claims and drawbacks that could be linked to these new habits in human nutrition.

Methodology

This project consists of three work packages:
WP 1: Preliminary information collection (ULg, UCL and CERVA-CODA)
WP 2: Biochemical and chemical analyses of contaminants and dietary supplement and functional food (ULg, UCL, UA, UGent and CERVA-CODA) and their interaction.

This research includes innovative analytical protocols and their validation, quick detection methods and predictive *in vitro* models pertaining to chemical safety (endocrine disruptors, toxins, plant protection products, dioxins, hormones, polycyclic aromatic hydrocarbons, ...). Interactions studies will be performed using existing *in vitro* models (based on culture of various cell types, prokaryotes and eukaryotes, and of isolated receptors) with mixtures of active substances at concentrations not yet studied until now and very close to the real situation in human nutrition. Extrapolation from the *in vitro* observations to the real dangers for human will be attempted.

INTERACTION BETWEEN THE DIFFERENT PARTNERS

The five partners will be organized in an interdisciplinary network. The partners will conduct complementary activities and their integration will be managed by the coordinator. The technical coordination activities are intended to ensure there is good communication and collaboration between partners and that the project deliverables are completed in a timely manner.



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EXPECTED RESULTS AND/OR PRODUCTS

- Database with exhaustive listing of dietary supplements, contaminants, food components and para-pharmacy products (their toxicology and beneficial effects)
- Overview of legislation (plants allowed in preparations, health allegations and labelling).
- Reports of the consulted panels of consumers and industries.
- Collection of samples: pure substances (analytical standards, ...), commercial preparations (dietary supplements, herbal preparations, ...), fractions obtained after preparative chromatography of crude extracts
- Optimized methods, protocols and performance characteristics for all assays and analytical methods
- Data on chemical contamination levels of dietary supplements available on the Belgian market
- Data on intestinal absorption and biotransformation of selected substances, alone or in mixtures.
- Data on pro- or anti-inflammatory effects of selected substances, alone or in mixtures.
- Data on biological effects detected with eukaryotic cell based assays (endocrine disrupting and dioxin-like activity)
- List of ingredients for which possible effects have been identified in the in vitro studies
- Prioritization of the possible risks for the consumers' health taking into account uncertainties linked to extrapolation to the real world
- Practical recommendations on work still to be done to better characterize the risks identified above
- Report with recommendations specifically addressed to the public authorities, agro-food and pharmaceutical industries and consumers
- Report on risk communication specifically addressed to the public authorities, agro-food and pharmaceutical industries and consumers

PARTNERS - ACTIVITIES

ULg

- CART (Centre of Analysis of Residues in Traces) is specialized in setting up and development of analytical tools, both biochemical and physicochemical, for residues and contaminants in the food chain.
- **SEED** (Socio économie environnement et développement) research unit is specialized in the field of environment. Themes are now extended to questions such as sustainable agriculture and food quality.

UCL

The Group of Cellular, Nutritional and Toxicological Biochemistry (BCNT) within the ISV (*Institut des sciences de la vie*) is working in the field of cell and physiological biochemistry and pharmaco-toxicology, by means of cell culture systems with mammalian cells as well as on human nutrition, biochemistry of lactation and animal nutrition.

CERVA-CODA

The department "Quality & Safety" contributes to a pro-active policy as regards safe food production, animal health, and public health on the federal and international levels.

UA

The research group Ecophysiology, Biochemistry and Toxicology (EBT) conducts research concerning the adaptation of aquatic and terrestrial organisms to their environment and the effects of environmental contamination on organisms, populations and communities

UGent

The Laboratory of Food Analysis develops new and innovative analytical techniques, such as rapid immuno-based field tests and also confirmatory chromatographic techniques in the field of analysis of chemical contaminants in food.

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Follow-up Committee

For the complete and most up-to-date composition of the Follow-up Committee, please consult our Federal Research Actions Database (FEDRA) by visiting <http://www.belspo.be/fedra> or <http://www.belspo.be/ssd>

