

FACET (Flavourings, Additives and food Contact materials Exposure Task)

Area of research interest: [Chemical hazards in food and feed](#)

Study duration: 2008-09-01

Project code: FS231027 (A03071)

Conducted by: FERA (as part of a Consortium)

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Background

The original concept behind FACET was the creation of a food chemical exposure surveillance system, sustainable beyond the life of the project to meet the needs of EU regulatory authorities in the protection of consumer health. At the outset, there were a number of bottlenecks in exposure assessment. These included access to national food consumption databases, difficulty with food categorization, limited knowledge on food chemical occurrence, lack of data on food chemical concentration and on packaging substances. FACET was designed to address all of these issues with regard to the specific concerns of flavourings, food additives and food contact materials.

The overall impact of FACET, which will use a risk-management approach, will be evident at a number of levels including: protection of the consumer, fostering innovation in the food chain, driving the scientific approach and influencing international food regulatory affairs.

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Research Approach

FACET constitutes a tool for post market monitoring since it reflects the real exposure of a targeted population to a food chemical, taking into account the variability of concentration and the real occurrence for each food category.

In summary, there were eight research work packages, which are organised in three linked groups:

- The Chemicals group (four work packages: flavourings, additives, packaging materials and concentrations). This group had as its focus, the target chemicals as outlined in the call. Each sought to determine a list of target chemicals in their given area to ascertain relevant concentration data. These data were gathered independent of the group responsible for collecting occurrence data since both were different.
- The Foods group (three work packages: food intake, chemical occurrence and regional consumption modelling). This group operated together for several parts of their work package and formed a link with other member states. The food intake group linked with the chemicals group to agree definitions of food groups and intakes of such defined food groups and worked with the database group to create suitable database architecture for food intake data. This group worked closely with the Regional Modelling Group to create the necessary input into the regional models.

- The Database and Modelling groups (exposure modelling work package). Databases were constructed which will show connectivity between intake, occurrence and concentration for each chemical. These databases will exist in tiers corresponding to the complexity of the data.

As leader of the packaging materials work package, Fera steered this work and also had a seat on the committee steering the overall project. Fera will also had substantial roles in the work packages on regional consumption modelling and database and modelling.

There were 28 milestones and 30 deliverables listed in the full description of work . For some, Fera was responsible and for the majority, other project partners bore responsibility. The successful completion of this project was dependent on the collective responsibility of all parties.

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Results

The original idea behind FACET was the creation of a food chemical exposure surveillance system which was, sustainable beyond the life of the project to meet the needs of EU regulatory authorities in the protection of consumer health.

The major achievement of FACET has been the creation of a publicly available exposure assessment software system for deterministic and probabilistic modelling of food chemical intake.

Additional, important developments in the project include the establishment of a migration modelling framework for packaging materials into foods, the construction of a tiered food intake database with an integrated harmonized food categorization system and the collection of extensive concentration data for additives, flavourings and food packaging migratory compounds.

For flavourings, a total of 41 substances were selected. Concentration data were also collected for natural occurrence of the target substances. Furthermore, analytical investigations for certain flavouring substances in foods have been conducted. In relation to food additives, 32 priority additives designed to assess additive usage levels were identified by the additives and industry questionnaires.

Criteria for these priority additives included high risk additives (additives for which the theoretical estimated intake is higher than the ADI in the first approach), additives with or without ADI, additives used quantum satis or with maximum levels, and certain target additives selected or who had their ADI recently modified.

For food packaging, data collection on the chemical composition of food packaging materials along with information on the extent and conditions of use was undertaken. The inventory list contains 6,475 substances that are either single substances or are defined or non-defined mixtures of two or more substances. A new in silico QSAR approach has been developed, validated and used to evaluate the toxicological significance of exposure to packaging substances.

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Published Papers

1. Oldring, P.K.T., Castle, L. & Franz, R. (2009) Exposure to substances from food contact materials and an introduction to the FACET project. Deutsche Lebensmittel-Rundschau, 105, 501-07.
2. Hearty, A., Gibney, M.J., Vin, K., Leclercq, C., Castle, L., O'Mahony, C., Oldring, P.K.T., Volatier, J.L., McKeivitt, A., Tennant, D., McNamara, C. & Kettlitz, B. (2011) The

FACET project: a chemical exposure surveillance system for Europe. *Food Science and Technology*, 25(2), 26-29

3. Castle, L., Kelly, J., Jickells, S.M., Johns, S.M., & Mountfort, K.A. (2012) Exploring the sensitivity of the zone of inhibition test for leachable biocides from paper and board food contact materials, and improvements thereof. *Food Additives & Contaminants*, 29(1), 139-148
doi: 10.1080/19440049.2011.616951
4. The FACET exposure tool - Methodology used for light metal packaging for listing substances, their use in and migration levels from different coatings. P.K.T. Oldring, F. Savrij Droste, R. Whitaker, D. Smith, C. O'Mahony and L. Castle. *CoatingsTech.*, 2014, in press.
5. Development of the FACET modelling tool to assess exposure to chemical migrants from food packaging. P. K. T. Oldring, C. O'Mahony, J. Dixon, M. Vints, J. Meghan, C. DeQuatre and L. Castle. *Food Additives & Contaminants*, 2014, in press.
6. Estimates of dietary exposure to bisphenol A from light metal packaging, using food consumption and packaging usage data: a refined deterministic approach and a fully probabilistic (FACET) approach. P.K.T. Oldring, L. Castle, C. O'Mahony and J. Dixon. *Food Additives & Contaminants*, 2014, in press.

Research report

England, Northern Ireland and Wales

PDF

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