

Assessment of consumer exposure to substances migrating from food contact materials

Laurence Castle
The Food and Environment Research Agency, York (UK)
on behalf of WP4 partners



Partners in WP4 – Packaging migration

- Fera - Food and Environment Research Agency, York
- FIG - Facet Industry Group, Brussels
- FABES Ltd, Munich
- Fraunhofer IVV, Freising
- Innventia, Stockholm
- USC - University of Santiago de Compostela, Santiago de Compostela
- INCDTIM - National Institute for R&D of Isotopic and Molecular Technologies, Cluj-Napoca
- JRC - Joint Research Centre, Ispra



Composition of the Facet Industry Group (packaging)

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FIG consists of 12 European trade associations

Packaging materials covered:

- paper and board
- plastics – rigid and flexible
- metal – rigid and flexible
- inks, waxes and adhesives

FIG contributed €0.5M in cash and €2M in kind.

FACET covers all retail packaging including some vending and take-aways (packed at the point of sale)



WP4 (Packaging) had 3 sub-WPs

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4.1 Packaging composition and usage

What is food packed in, what chemical substances are present and what are the contact conditions (t / T / SA:M) that sets the migration level

4.2 Migration modelling

For each eating occasion, use properties specific to each food type and each packaging material, along with the time and temperature conditions of contact, to calculate the migration concentration

4.3 (Quantitative) Structure Activity Relationships

Hazard identification based on the molecular structure of the chemical



Food contact materials; session outline

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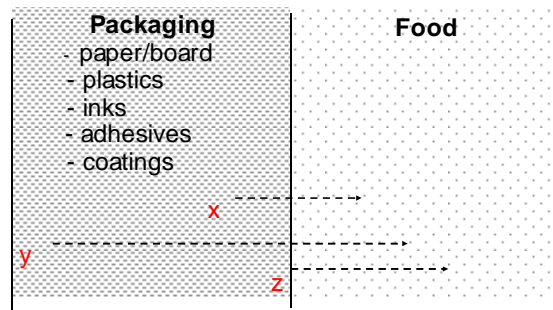
1. Laurence Castle, FERA, UK
Scene setting, what was needed & how was it all put together
2. John Dixon, Facet Industry Group, BE
Packaging composition and usage
3. Roland Franz, Fraunhofer IVV, DE
Development of the migration model
4. Laurence Castle
Use of QSAR modelling for migrants
5. Cian O'Mahony, Crème Global, IE
Software description and demo
6. All
General questions and discussion



Chemical migration from packaging

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Constituents of packaging are not added to foods



Task: Derive occurrence and concentrations in the foods as eaten

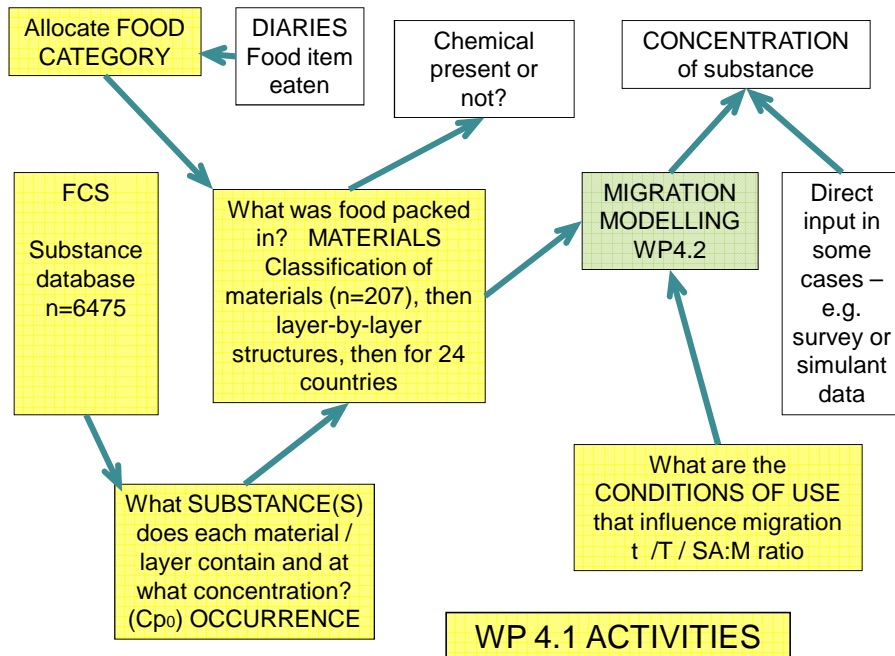


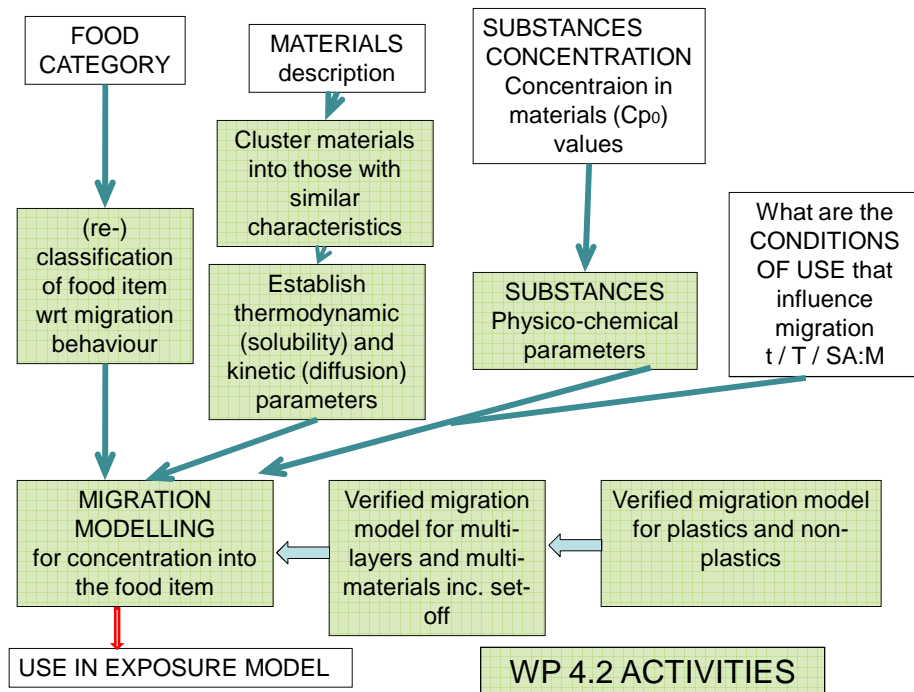
Food Contact Substance database

~ 6,475 substances from inventory lists of all FCMs
Decernis checked the list as they did for the EFSA-ESCO task

Want to cover all substances used therefore strong requirement for migration modelling

CAS no., MW, log Pow, SMILES code, dual-use flag, etc
The FACET database fits with the DG-SANCO database covering EU-regulated FC-substances
~ 674 substances have use data in the FACET tool





Material codes & packaging structures

- 207 basic material codes, plus 224 ink-related codes (inks for different substrates and printing processes)
- Compositional information provided on all these materials - occurrence (substances used yes/no, market shares, concentrations in the material e.g. min, max, typical)
- Can coatings – extraction data in place of C_{po} and migration modelling
- These materials are then combined layer-by-layer to make packaging structures (up to 7 layers in the migration model) with layer order and thickness.

F / M1 / M2 / M3 / etc



Migration modelling needs:

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Kinetic: diffusion coefficients of substances

- in materials and in foods

Thermodynamic: partition coefficients of substances

- between materials and between materials / foods

- Including the temperature-dependency



FACET contains:-

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- Database of FCM substances for all sectors along with phys/chem properties
- Information on material composition (occurrence, concentrations)
- Information on packaging usage by food type (market shares, layer-by-layer descriptions)
- National food consumption databases
- Migration calculation module for multi-layer and multi-material food packaging
- Exposure assessment module
- Extensive consideration and statement of uncertainties
- QSAR tool to estimate hazard of food contact substances using OECD toolbox



Options

- User brings own migration data
- The pre-loaded compositional information is used to calculate migration levels for the existing materials and structures and t/T conditions etc in the databases.
- The user can enter a new or an existing substance and link it with new or existing packaging applications (materials, structures, foods).



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