

EU Project QLK1-CT2002-2390



Modelling migration from plastics into foodstuffs as a novel and cost efficient tool for estimation of consumer exposure from food contact materials

Roland Franz,
Fraunhofer IVV,
Freising
GERMANY



Fraunhofer Institut
Verfahrenstechnik
und Verpackung

EU Project QLK1-CT2002-2390

First of all:

**Thank you all
for your interest
in our project and
for coming!**



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Contents

- **Why did we get into this project?**
[or:
Why was the project unavoidable?]
- **Intention & structure of the project**



Why the project?

Migration tests should be

simple and reproducible

**and have therefore been carried out
so far using in the first place**

food simulants

and not foodstuffs.



Why the project?

On the other hand:

EU legislation foresees that for compliance

the concentration (migration)
in food

is the crucial one compared to the
food simulant test.



Why the project?

And:

Exposure estimation or assessment should (must) be based on

**the concentration (migration)
in food**

**and not on migration values in
food simulants.**



Why the project?

Consequently,

a **correlation** is needed between
food simulants and **foods**

**which is the intention of
EU Directive 85/572/EEC.**

**However, problems were getting more
and more evident over the years**



Why the project?

... for instance
with these examples:
(where migration is
given as relative
values:
food / olive oil)

(Source: EU Report 19376 EN)

Food item	RF	Relative migration default	measured
Chocolate spread	X/3	0.33	up to 1
Chocolate	X/5	0.2	up to 1
Salami	X/4	0.25	up to 0.88
Cocoa powder	X/5*	0.2	up to 0.85
Mayonnaise (low fat)	X/3	0.33	up to 0.83
Mayonnaise	X/3	0.33	up to 0.80
Peanuts	X/5*	0.2	up to 0.52
Butter	X/2	0.5	up to 0.57
Cheese (low fat)	X/3*	0.33	up to 0.19
Whole milk	(A)	n.a.	up to 0.27
Irish cream liqueur	(C)	n.a.	up to 0.45
Flour	(NT)	0	up to 0.42
Buiscuit (rich tea)	(NT)	0	up to 0.58
Bread	(NT)	0	up to 0.08



Why the project?

More recent examples from the ,ITX crisis‘ [photo initiator in printing inks transferred to food via set-off] revealed again weaknesses of the 85/572/EC system



Why the project?

**ITX and EHDAB
levels in
“cloudy” drinks
(fruit juices/nectars)**

Product	Pack size(ml)	ITX (µg/l)	EHDAB (µg/l)
Apple/acerola juice	200	45	16
Apricot nectar	200	63	33
Orange juice	200	136	46
Orange juice	200	201	88
Multivitamin drink	200	30	17
Multivitamin juice	200	249	125
Peach nectar	200	95	35
Pear juice	200	70	24
Pineapple juice	200	32	10

**... altogether 45 products measured
with found concentrations for**

- ITX between 20 ppb and 250 ppb**
- EHDAB between 10 ppb and 125 ppb**

(Source: EFSA opinion
on ITX and EHDAB in FCM,
dated 7 December 2005)



Why the project?

ITX and EHDAB levels in “clear” drinks (fruit juices/nectars)

Product	Pack size (ml)	Juice content (%)	ITX (µg/l)	EHDAB (µg/l)
Apple juice	1000	100	< 5	< 5
Apple juice	1000	100	< 5	< 5
Apple pear drink	1000	6	< 5	< 5
Cherry drink	1000	35	< 5	< 5
Cranberry & Raspberry	1000	21	< 5	< 5
Cranberry drink	1000	25	< 5	< 5
Elder flower drink	1000	22	< 5	< 5
Fruit drink	1000	20	< 5	< 5
Juice/alcohol drink	1000	15% alcohol	< 5	< 5

... altogether 17 products measured and in all cases found concentrations were not detectable, i.e. < 5 ppb

(Source: EFSA opinion on ITX and EHDAB in FCM, dated 7 December 2005)



Why the project?

ITX and EHDAB levels in milk and soy beverages

Product	Fat content (%)	ITX (µg/l)	EHDAB (µg/l)
UHT milk	3.8	142	71
UHT milk	1.5	177	92
UHT milk	0.1	54	27
Soy milk	1.5	219	134
Soy milk vanilla	1.5	170	90
Soy milk & juice	0.6	137	71
Chocolate milk	2.9	295	148

It should be noted that water and 10% ethanol would give 'not detectables' (< 5ppb)

(Source: EFSA opinion on ITX and EHDAB in FCM, dated 7 December 2005)



Why the project?

Further
advantageous
circumstances
were that...

... enormous progress has been made over the last decade in **migration modelling**, in particular for mono-plastics in contact with food simulants, but also for multi-layer plastics.

... essential developments have been made in the area of **certified or certifiable reference plastics films** in relation to migration relevant specifications.





www.foodmigrosure.com

Modelling Migration from Plastics into Foodstuffs as a Novel and Cost Efficient Tool for Estimation of Consumer Exposure from Food Contact Materials

Total project costs: 2.35 Mio €
EU contribution: 1.19 Mio €

Project coordinator:

Dr. rer. oec. Franjo
Fraunhofer IVV
Process Engineering and Packaging IVV
Giggenhauser Str. 35
85354 Freising, Germany
E-mail: franjo.franz@ivv.fraunhofer.de

Project sponsor:

Contact: cec@ivv.fraunhofer.de
Starting date: 1st January 2003
Duration: 43 months
End of project: 30th September 2007
Project partners:
Project cost: 2.35 Mio €

Scientific Officer: Mrs. Dyanne Bennink, European Commission DG Research
E-mail: Dyanne.Bennink@cec.eu.int



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Project partners

9 Partners from 7 European countries including 1 European Association

No. LOGO	Partner
(01) FhG IVV	Fraunhofer Institute for Process Engineering and Packaging, Freising, DE
(02) DEFRA-CSL	Central Science Laboratory, Dept. Food Environment & Rural Affairs, York, GB
(03) IFA	IFA Lebensmittel-Forschungsinstitut, Freising, DE
(04) FIRA	Fira International, Leatherhead, GB
(05) EC-JRC-IHCP	EC Joint Research Centre, Inst. Health and Consumer Protection, Ispra, IT
(06) IHT	Institute of Food Technology, University of Stuttgart, Stuttgart, DE
(07) TUV IFCT	Vienna University of Technology, AT
(08) NESTLÉ RC	Nestlé Research Centre, Lausanne, CH
(09) CEFIC-FCA	European Chemical Industry Council, Food Contact Additives Panel, Brussels, BE



The idea

The basic equation to calculate FCM related exposure:

$$Exposure = \frac{\sum C_i \cdot P_i \cdot M_i}{\sum C_n}$$

via migration modelling

where:

C_i = consumption rate of a particular food i

P_i = relative packaging usage of a given FCM for a particular food i

M_i = migration rate from a given FCM into a particular food i

n = number of foodstuffs considered for the exposure estimation

Main Objective

FOOD
MIGROSURE

.... was to develop an into-food migration model as a novel and economic tool that may be applicable in two different ways:

(1) As a stand alone tool to estimate exposure related migration within the conventional frame conditions of the EU food regulatory evaluation system thus applying a worst case exposure scenario, i.e.:

$$Exposure = \sum M_i$$

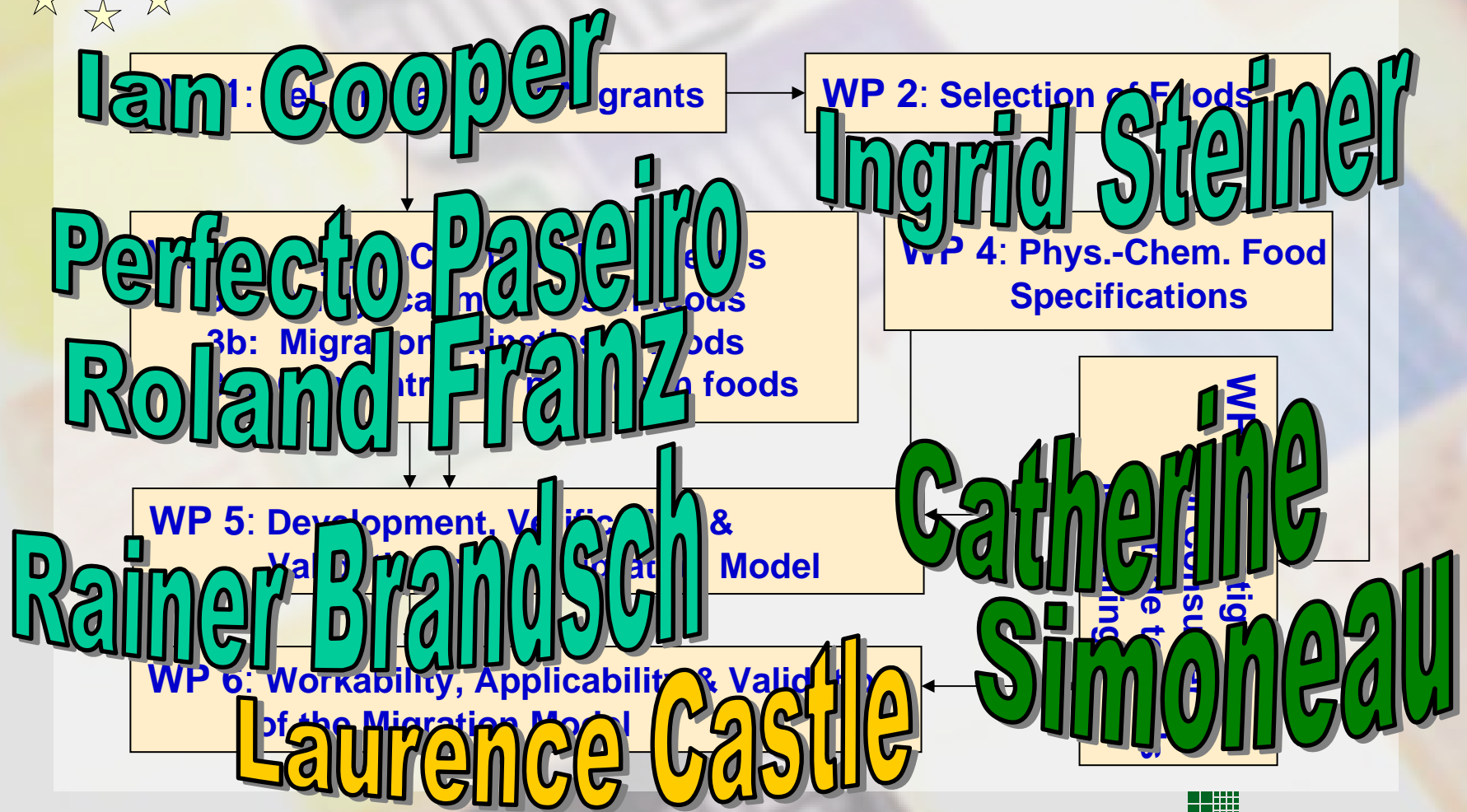
(2) In conjunction with statistical data obtained from food consumption and plastics packaging surveys to estimate realistic or worse-case exposure for any situation of interest, i.e.:

$$Exposure = \frac{\sum C_i \cdot P_i \cdot M_i}{\sum C_n}$$





Project structure



Expected Benefits

.... for EU Commission and EFSA

In general:

Supporting present and future EU legislation for FCM

In particular:

- Scientific/technical basis for actualisation of Directive 85/572/EEC issues
- Bringing more light into the dark related to meet specific restrictions (SMLs) on the level of foodstuffs
- Supporting and plausibilisation of exposure estimations
in context with petitions and setting specific restrictions



Expected Benefits



.... for Industry

Packaging industry:

- Early (in the packaging development process) and food type specific compliance evaluation
- Cost efficient compliance ensurance

Food industry:

- Improving or even establishing independent house-internal quality assurance tools and this in a better product specific way
- More knowledge about diffusion and partitioning processes or organic compounds in foods



Expected Benefits

.... for the Consumer
including 'consumer protectors'

- **Better and more effective surveillance of FCM**
- **(Further) familiarisation with the idea of 'Migration Modelling' and increasing acceptance of calculated migration values**
- **(Somewhat) cheaper packed foodstuffs?**

And with the possible effect of ...

**decreasing the FCM related conflict potential and
generating more confidence in FCM safety?**





www.foodmigrosure.com

Thank you,
also on behalf of the
FOODMIGROSURE
project team



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