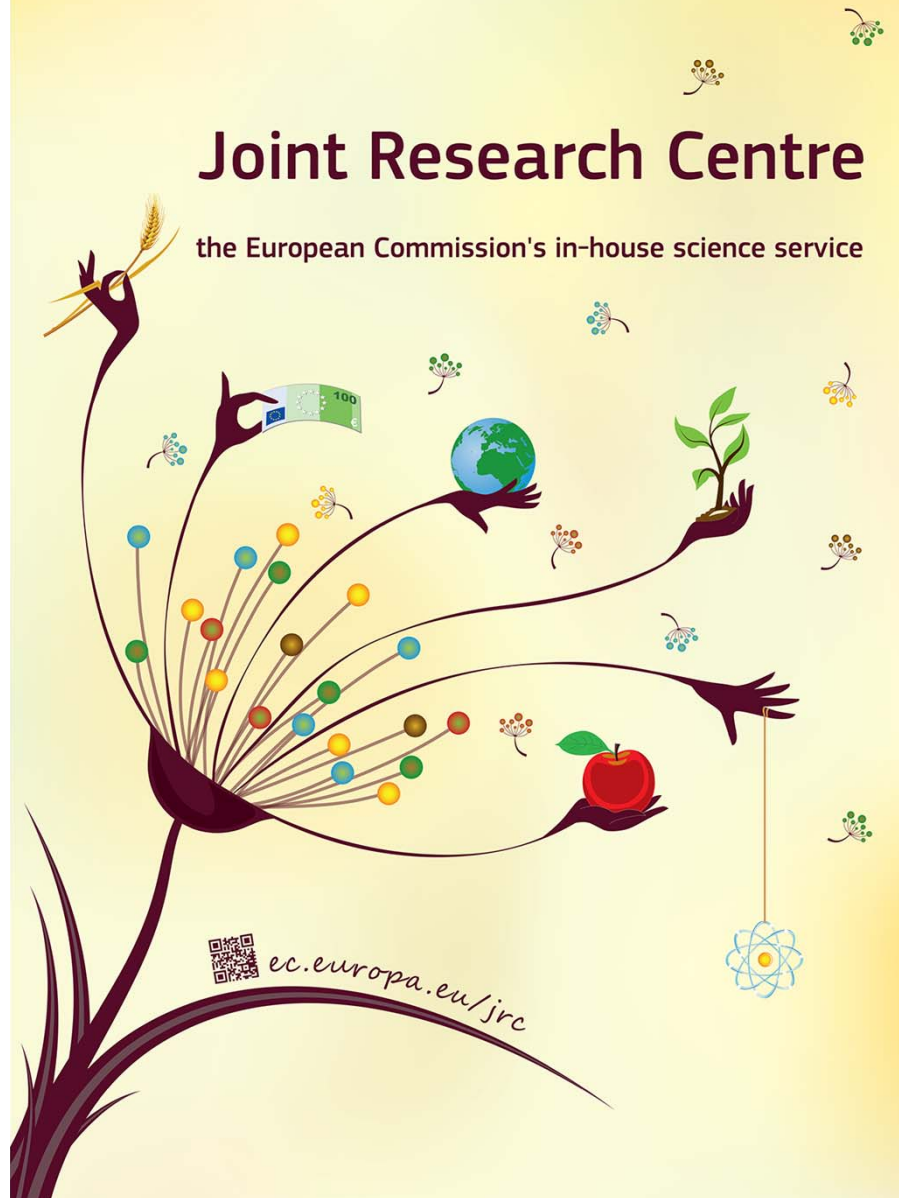


Joint Research Centre

the European Commission's in-house science service



Food Contact Materials- challenges and achievements

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FCM: a technologically driven sector



FCM = packaging + food machinery + kitchenware



Conventional :

- Plastics, including multilayers
- Regenerated cellulose, Paper and board,
- Glass and ceramics,
- Elastomers, Metals, Wood, textile, waxes etc.



Sustainable (biobased, recycled, etc)

Innovative (active, intelligent, nano)

Role as JRC and EU Reference Laboratory

**Risk
management
(SANTE)**

*As FCM activities since 1995
Serving sectorial policies on
release of substances from
food contact materials*

Work

migration testing, scientific
support for FCM legislation

Ad-hoc contributions to EFSA
for exposure assessment

Official controls

**Member State
Authorities and
Enforcement
Laboratories**

*As EU Reference Laboratory
nominated in 2004*

EUURL
European Union Reference Laboratory
for Food Contact Materials



Work

Supporting Regulation 882/2004 on
official food controls Member State
authorities and enforcement
Laboratories (NRLs)



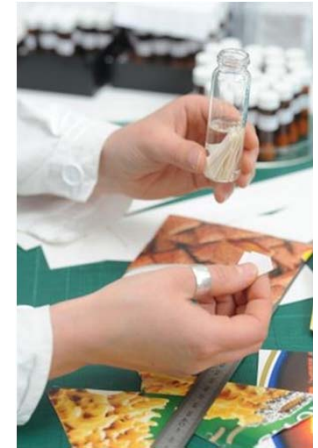
EURL role: challenges and limitations

Official controls in support to EU legislations

- FCM: 17 materials framework– only 3 are EU harmonised
- Main area for EURL : plastics (materials and articles)
- Others: various national legislations -> JRC policy work

Limits: as Specific Migration limits (SMLs)

- Need to simulate migration + quantification (polymers)
- 6 simulants, 4 testing modes, >1000 substances
- Test materials are polymers back engineered to reach SML
- Need also be homogeneous and pass stability (antioxidants..)



Limitations => if it could be done, it would have been done....

- Commercial PT rounds NEVER been offered for SM on materials

Challenges: gaps in enforceability of plastics for test methods for compliance

Plastics: >1000 substances regulated relying on:

- Having the correct **calibrants** and access to them
- Having **methods** of analysis

There are only 28 CEN methods (no Codex, no ISO,...)

Petitions go back to 1970s with no methods (about 260 OK)

Only about 300 substances available as calibrants

Tip of the iceberg: non harmonised areas represent > 9,000 substances

Work of JRC as link EFSA-COM since 1996 for methods and substances petitioned can feed into support to the EURL



JRC strategy as EURL

Overarching principles:

- New topics since so much to cover and NO control plans
- Priorities are decided by the network of NRLs
- Collaborations with professional associations
- Combine exercises to serve also as “validation” – precision criteria over flexible method descriptions
- In cycle of 3 yrs (pilot/precision- confirmation PT yr1-2)
- Use EURL platform to develop guidances (year3)

In practice:

- ILCs (2-4/yr since 2005)



A wide coverage of ILCs

Cannot test on every food: "simulants"

- ⇒ new inception of PPPO as simulant for dry foods in 2011
- ⇒ JRC validated methods to use PPPO in testing
- ⇒ Conducted PT to derive precision criteria for 6 surrogates
- ⇒ First time ever validation of migration + quantification
- ⇒ Developed a protocol for polymer surrogate



Compliance testing without experiments: Modelling

- ⇒ Diffusion modelling accepted for compliance
- ⇒ JRC guidance on applicability of models
- ⇒ Trainings to NRLs (2002, 2006, 2010) and PTs on 3 softwares
- ⇒ Now used also by NRLs/ OC for checks for screening purposes

$$-\frac{\partial c}{\partial t} \Big|_{\text{total}} = -D \left(\frac{\partial^2 c}{\partial x^2} + \frac{\partial^2 c}{\partial y^2} + \frac{\partial^2 c}{\partial z^2} \right) + \left(v_x \frac{\partial c}{\partial x} + v_y \frac{\partial c}{\partial y} + v_z \frac{\partial c}{\partial z} \right) + k_p c^n + k_d c$$

$$\frac{\partial c}{\partial t} = D \cdot \frac{\partial^2 c}{\partial x^2}$$

PPPO: Poly(2,6-diphenyl-p-phenylene oxide), ie. Tenax®

$$t_2 = t_1 * \text{Exp}((-E_a/R) * (1/T_1 - 1/T_2))$$

Practical enforceability: harmonising correct interpretation of EU law for testing

Technical guidelines = bridge legislation and lab work

- Sampling and test conditions for kitchenware (2009)
- Sampling and testing of polyamide and melamine kitchen utensils subjected to a specific measure on imports in 2011 imposing random controls of 10% consignments

Worldwide use and effect:

⇒ ILCs showed improvement from 63% to 100% (both NRLs and OCLs up to 66 participants)

⇒ 3rd countries imports non-compliant to safety limits decreased from 11% to 1%



Mixing JRC and EURL towards development of policies: example of ceramics

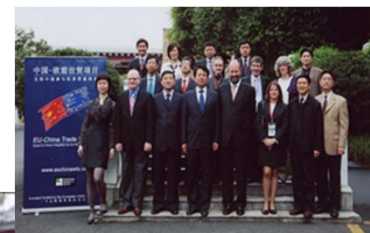
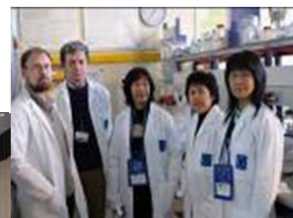
- Ceramics: 1985, only 2 metals (release Pb and Cd)
- New: rim, crystal, bakeware, 10 metals, lower limit (by 400)
- Solve technical questions BEFORE policy discussions:
 - What can migrate? New testing approaches?
 - Simulations at room temperature possible for bakeware?
- Key= collaborations with stakeholders (>4500 tests samples)
- Goal: pragmatic options (food safety, trade, feasibility)
- 2015: ILC on 8 metals and 55 participants fed into ISO TC 166
- 2016: migration ILC, rim tests, crystalware, bakeware.
- Mixed stakeholder open group



Scientific and technical capacity building

Trainings for NRLs

- Third countries, e.g. Thailand, China, Vietnam, Singapore, Indonesia, Turkey, etc
- DG SANTE Food and Veterinary Office,
- EU China Trade Project (China) – since 2008



Keeping up: always different topics!



Inks, UV curing agents



epoxy resins



baby bottles



dry foods, multilayers
materials



gaskets and
plasticisers



Kitchenware (China
imports)



Ensuring FCM safety in innovation based on "science with a purpose"

Consumer

Demands convenience, quality, protection

Industry

Innovation - (functional, safe, smart/intelligent, sustainable), compliant in a global market

Consumer groups, media

Acceptance, public perception

Official Controls

Enforcement compliance

CEN/ISO

Standardisation

European Food Safety Authority

Risk assessment

DG SANTE Member State Competent authorities

Risk Management, EU harmonisation

Council of Europe

Input in non-harmonised areas





European
Commission



*Thank you
for your attention!*

Joint
Research
Centre