



Contact:
Dr. Catherine Simoneau

Community Reference Laboratory



Food Contact Materials

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The Wrap Sheet

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I N F O R M A T I O N B U L L E T I N

Packaging: friend or not?

When people think about food safety, they rarely think about what is used to pack the food. With good reasons mostly, since the purpose of food processing equipment or packaging is to preserve foodstuffs so they last longer with a high quality.

Food packaging plays an important in protection from deterioration and towards the supply of high-quality food.

Yet these materials are in contact with foods, they must be also safe.

The EU provides specific laws and rules for food packaging ingredients just like it does in a sense for food additives, colorings etc. A specific EU Legislation specific to food contact materials (FCM) is setting numerous restrictions for substances used and potentially released from these materials. It

imposes limits for their transfer and their presence in foods from packaging. There are standards in place to make sure the constituents of food packing will not contaminate foodstuff.



We demand the convenience brought by packaging

The diversity of the materials and the complexity of foods poses a relevant challenge to the analytical chemist to assess the safety and compliance of

these materials in the current restrictions.

The JRC had recognised long ago the importance of the issue as an inherent part of the food safety frame. That is why since 1995, a dedicated activity was created and has been permanently implemented within JRC. This activity on the safety of FCM part of the IHCP serves the risk managers (the European Commission) to develop new laws or modify existing ones, but also the Risk Assessment EU body which is the European Food Safety Authority (EFSA), and even the European Committee for the standardisation of methods of analyses. In 2004 the JRC was nominated in the food legislation for official controls as Community Reference laboratory (CRL) for Food Contact Materials (FCMs).

Food Contact: All in my kitchen?

Materials and articles in contact with food (also called Food contact materials or FCM) refer to all materials and articles intended to come into contact with foodstuff, including packaging materials but also items such as kitchen appliances, cutlery, crockery, processing equipment and tubing. The term covers contact with water intended for

human consumption except fixed public or private water supply equipment.

These items are important in everyday life and kitchenware is a staple in modern homes. These are also made of a wide variety of substances which constitute the different types of materials including ranging from plastics, regenerated cellulose, paper and cardboard, glass and

ceramics, elastomers (natural and synthetic rubbers), metals, wood, textile, waxes, etc. Appropriate EU legislation regulating substances is a key element but the issue also needs a reliable and harmonised analytical control system.

The CRL-FCM plays a key role in facilitating this work by providing harmonised analytical methods, reference data and a

Did you know?



Your coffee cup is a food contact material subjected to the same laws as food packaging

Why are foods packaged?

Safe and high-quality food supplies rely on efficient protection from deterioration. Food packaging has an important role to accomplish in this matter, Foods are packaged to protect them and keep them in good condition while they are delivered to supermarkets and stores, stacked on shelves or stored at home.

What functions does packaging perform?

The primary packaging of the food contains it; preserves it, and protects it from biological

contamination by insects or germs. It also protects it from chemical contamination during the processing, distribution and shelf life of the product. It also provides mechanical protection to fragile foods like chips. In addition, it carries the identification and description of the contents; Packaging also provides visible evidence of product integrity or tampering. Finally it reduces household waste by providing only the edible part of foods.

The outer packaging (e.g. cartons) is an essential means

of transporting to retail stores large packed quantities for stacking on store shelves.

Do we really need the protection of packaging ?

Yes. Food safety absolutely requires it. A World Health Organisation study also indicated that in developed countries with modern storage, packaging and distribution systems, wastage of food is estimated at only 2-3%. In developing countries without these systems wastage is estimated at between 30% and 50%.

“A package must protect what it sells and sell what it protects “

Paper, cans, plastics.....and my foods

Why are there so many different packaging materials?

Packaging comes in a variety of shapes and materials and include flexible or semi rigid plastics, paper bags & board boxes, can coatings, ceramics, glass, and much more. Many types of materials can be used for food packaging ranging from plastics, regenerated cellulose, paper and board, glass and ceramics, elastomers (natural and synthetic rubbers), metals, wood, textile, waxes etc. Recent years have also seen the appearance and evolution of new materials such as biobased which are produced from renewable sources.

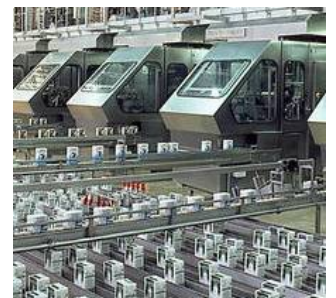
appropriate type of packaging for a product, depending on the nature and requirements of the product, the degree and nature of protection needed, the method of distribution, the shelf-life and the environmental impact.



food. The packaging material for a particular food must therefore be carefully selected with these considerations in mind. Whenever a food is placed in contact with a non-food material there is the potential for migration of some of its ingredients into the food. Considering foods are often subjected to sterilisation and high temperature while already in the package (e.g. cans) and that many packed foods have a long shelf life, both legislation and testing must be directed towards ensuring safety of the food.

Do packaging materials affect the food in them?

The packaging material has both to preserve the food and to protect it from deterioration, outside contamination or damage during distribution and storage; and the packaging material in direct contact with a food must not itself harm, or be harmed by, the



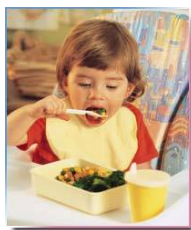
The many materials used for food packaging..



Most food products can be packed in a variety of alternative ways. Manufacturers choose the most appropriate



Who watches out for me?



How is consumer safety ensured?

There are three aspects: the law made by the European Union and the ministries, there are the national food agencies that always watch for risk, and there are

“enforcement” laboratories acting much like the police and conducting checks on products.

Europe and many other countries have developed strict controls, based on extensive testing, for the use of ‘food contact’ materials; and these help to ensure that a correct choice is made and that substances can be used as “food contact substances” They must be found safe for their intended use. To that effect there are not only

national laws specific to materials entering in contact with foods, but also harmonised European laws; Packaging manufacturers or a food producer must ensure compliance with the law. These laws can authorise the use of substances, based on extensive toxicological tests as well as chemical tests showing that consider the amount of substance expected to migrate into food without causing any health concerns.

“Robust analytical tools and methodologies facilitate the assessment of the safety of consumer product to give consumer trust”

What we do at JRC

Science to drive new laws

The mission of our activities is to support EU policies in the field of FCM and food safety, In support of current and future EU legislation on FCM the JRC performs research on migration of chemicals from FCM, their potential reaction in such materials or with foodstuffs upon migration. They also monitor new developments in expanding areas such as biomaterials, active packaging, recycled materials as in co-operation with other Units within JRC or adequate sources when necessary.

CRL- FCM”: towards official controls

Millions of testing measurements are performed in Europe every year. The results of these meas-

urements influence important decisions in industry and food safety control. Testing results should therefore be reliable and comparable everywhere. This can only be realized by standardisation, harmonisation and assuring the quality of measurements. As CRL for FCM a prime objective is to build confidence in the comparability of measurements by the production and dissemination of internationally accepted quality assurance tools, including validated methods, reference materials, reference measurements, interlaboratory comparisons and training. The CRL functions with a supporting network of European National Reference Laboratories (NRLs) nominated by their competent authorities.

The CRL-NRL network

The main objective of this network is to connect European scientists in the area of food contact materials in order to:

- 👉 Solve problems faced by enforcement laboratories in the field of food contact safety
- 👉 Exist as a network of scientific institutions supporting the food and chemical community policies
- 👉 Foster science based development, validation and harmonisation of modern analytical tools for the quantification of substances released from FCM

We see the creation of this European Network of Food contact laboratories as a response to face these challenges on a European



Some achievements....

- 👉 Laboratory work on method development and metrology in chemistry for existing and future polices.
- 👉 Development test materials and calibrants for official control purposes,
- 👉 Development of databanks
- 👉 methods of analysis
- 👉 Development of guidelines on testing and sampling, and method performance
- 👉 Validation of methods towards standardisation by the European Committee for Standardisation (CEN)
- 👉 Exposure assessment or expert contributions to the European Food Safety Authority (EFSA)
- 👉 Organisation of trainings courses, for official controls, inspection and other bodies



Workshop for journalists

Community Reference Laboratory



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Contact:

Dr. Catherine Simoneau

EUROPEAN COMMISSION,
DG-JOINT RESEARCH CENTRE
INST. FOR HEALTH & CONSUMER PROTECTION
UNIT PHYSICAL AND CHEMICAL EXPOSURE,
T.P. 260
ISPRA VA 21020

ph: +39.0332.785889

fax: +39.0332.785707

e-mail: catherine.simoneau@jrc.it

*“Harmonised analytical tools for
consumer trust in safer food packaging”.*



The CRL-FCM aims to be a one-stop portal supporting the European Commission, the industry and the enforcement laboratories and connecting aspects of science and data from exposure assessment (European Food Safety Authority - EFSA), to standardisation (CEN) through to enforcement and stakeholders in the food and feed industry.

The technical issues can be tackled in a more transparent way, making the regulatory framework more efficient, manageable and flexible, and therefore boosting public confidence by having in place a strong pan-European network of expertise.



Let's see a typical example....

One striking example was the work on plasticisers for glass jars. Plasticisers are used in closure gaskets for the metal lids used to seal glass jars and bottles in order to form the airtight seal needed to prevent microbiological contamination of baby foods, and other foods such as sauces and condiments. While the plasticiser is necessary to have this mechanical plasticising role, it also has a potential for migration into the food both during sterilisation and storage because the quantities used are up to 40% in order to provide the elasticity of the gaskets to seal the jars hermetically. Following some national data, the JRC conducted an EU wide survey and shown fairly high levels of certain plasticisers in foods, including in baby foods. So the JRC

started by comparing and implementing methodologies for the analysis of these plasticisers in gasket from lids of glass jars, then once the method was checked that it was working well, the JRC conducted a EU survey analysing products, monitoring in particular baby foods to generate an exposure



Samples of the first survey in baby foods

assessment for infants consuming commercial infant foods.

The JRC then gave the data and an evaluation to the European Food Safety Authority (EFSA, the EU body responsible for Risk assessment). The exposure assessment was published under the EFSA. The recommendation was used as basis for creating new laws regulating lids in two legislations (Directive 372/2007/EC and further in Directive 19/2007/EC).

For the correct implementation of these new Directives, the JRC then provided support by providing training for laboratories, and organising comparative testing to assess how well official controls laboratories performed in the EU for these types of analyses.

For example, As Community Reference Laboratory (CRL) nominated for the EU, the CRL FCM also participated to the training in Thailand and China, and organised 4 “proficiency trainings” for its network of EU official controls national reference laboratories to assess the performance of laboratories in the EU and evaluate the need offering ad-hoc training if necessary.

The impact was that in a cycle of 2 years, the work strategically encompassed from the implementation of methods in the laboratory to exposure assessment of target high consumers) leading to recommendation in consumer protection.