

WORKING PARTY ON CHEMICAL CONTAMINANTS FROM FOOD CONTACT MATERIALS AND ARTICLES

DISCUSSION PAPER: FUTURE FOOD STANDARDS AGENCY-FUNDED RESEARCH ON CHEMICAL MIGRATION FROM MATERIALS AND ARTICLES IN CONTACT WITH FOOD

PURPOSE

This paper sets out the general background to FSA-funded research on chemical migration and the associated role of the Working Party. It seeks the views of the Working Party on possible future work.

By way of background this paper includes a list of research projects completed in the past year and currently in progress (Annex I), and gives brief details of further work which may be commissioned in FY 2002 (Annex II).

The paper also suggests topics for projects which could be commissioned in FY 2003 (Annex III). The examples given in Annex III are intended to stimulate discussion. **The Secretariat would welcome ideas from Members.**

Annex IV looks at the wider picture. **Members are requested to consider what priority should be given to the general areas of work identified as of equal priority in part I of Annex IV.**

**SECRETARIAT
OCTOBER 2001**

BACKGROUND

1. The Working Party advises the Food Standards Agency on the research and surveillance projects necessary to ensure that both consumers and industry in the UK are adequately protected from the migration of chemicals from materials and articles into food or drink. It also considers the results of such work.
2. The Food Standards Agency funds research and surveillance projects, by open competition, to underpin current and future policy on food contact materials. Periodically potential contractors receive Requirements Documents which invite bids for new scientific work. The criteria on which bids are selected include relevance to policy requirements, overall scientific quality and potential value for money.
3. The results of the projects inform policy work in a number of ways. At one level they serve to protect public health and to increase technical knowledge. At a more detailed level they inform reviews of European Commission (EC) draft Directives on food contact materials, e.g. on plastics or ceramics. The projects also inform UK input into discussion on future specific EC Directives anticipated in Directive 89/109, e.g. on paper and board, metals and alloys, elastomers and rubber. The results of projects also inform work at the Council of Europe to develop resolutions and guidelines on materials which are not yet covered by EC Directives.
4. The FSA's research work helps to provide a sound scientific basis for Council of Europe and EC proposals on chemical migration. It provides information about the nature and the levels of chemical migrants. It develops methods of analysis for the more important substances. It also increases understanding of the factors that influence chemical migration.

CURRENT RESEARCH PROJECTS

5. A list of Food Standards Agency-funded research projects on food contact materials and articles completed in the past year and projects currently in progress is at Annex I.

FUTURE WORK

PROJECTS FOR COMMISSIONING IN 2002

6. A list of projects, which may be commissioned in FY 2002, is at Annex II. Invitations for bids for these projects were issued in the latest Food Standards Agency Research Requirements Document, which was published in September this year. The deadline for bids has just passed.

PROPOSALS FOR PROJECTS FOR POSSIBLE COMMISSIONING IN 2003

7. Areas of work in which projects might be commissioned in FY 2003 need to be identified now for inclusion in the next Requirements Document. A number of possible topics are listed at Annex III.

STRATEGIC CONSIDERATIONS

8. Annex IV looks at this research programme in terms of likely future needs. In part 1 of this Annex there are several types of materials for which there are apparently similar net needs for information (laminates, coatings, elastomers, adhesives etc.). It would be very helpful if Members could comment on what priority should be given to research on these materials.

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ANNEX I: RECENTLY COMPLETED AND CURRENT RESEARCH PROJECTS

Recently reported projects*

PROJECT TITLE	Contractor
Certified reference material and migration test method for fatty contact in support of EC Directives	Central Science Laboratory, York (CSL)
Systematic evaluation of chemical migration during low temperature storage of packaged foodstuffs	CSL
Evaluation of the scientific basis of EC Directives 82/711 and 85/572 - migration into simulants versus foods	CSL

* Reports for these projects are available in the Food Standard Agency's Library, Aviation House, 125, Kingsway, London, WC2B 6NH

Current Research Projects

PROJECT TITLE	Contractor
Further research on chemical migration from food contact rubber and other elastomers	RAPRA Technology Ltd., Shrewsbury (RAPRA)
Definitive test for set-off of pigments and other non-volatile substances for flexible packaging	Laser Installations Ltd., Arbroath, Dundee University and CSL
Investigation of the migration of metals from glazed ceramic ware	CSL
Investigation of the migration of inorganic contaminants into dry food from packaging made from recycled paper and board	Imperial College, London

Investigations into how glass fibre reinforced plastic (GRP) vats can be repaired to minimise migration of styrene into food	CSL
Methods and searchable spectroscopic libraries to identify substances migrating above a 1ppb threshold	CSL
Identification of stages in the production of paper and board packaging materials where hazards to food safety may occur	CSL
Migration test protocols for electroplated and dipped metal-ware intended for food contact	CSL
Investigation into the effects of the freeze thaw cycle on chemical migration from packaging into foods	CSL
Investigation of the migration of chemicals from agglomerate, natural cork and synthetic stoppers	CSL
Study of packaging materials used for dietary staples	PIRA International, Leatherhead
Migration from recycled paper and board to dry foods. Research into the factors involved, leading to practical avoidance and amelioration measures	CSL
A systematic investigation into chemical migration from inks and associated coatings used on the food contact surface of packages	CSL
Strategy for assessing risk and assigning priorities to chemicals used to make food contact materials. A tiered approach with progressive refinement to calculate exposure levels	CSL

Collation and review of information on the use of unusual and non-traditional types of wood used as food contact materials	Leatherhead Food Research Assoc. and TRADA Technology Ltd., High Wycombe
Determination of the potential for transfer from secondary packaging to foods and development of guidelines to reduce transfer to levels of no concern	King's College, London
Investigation into the migration of metals and coating materials from kitchenware products	CSL
Investigation of the significant factors in elemental migration from glass in contact with food	Glass Technology Services, Sheffield
Development of multi-methods for determining the migration of additives included in the proposed 6th amendment of Directive 90/128/EEC	RAPRA, TNO Netherlands
Investigation of chemical migration into take-away foods	CSL
Investigation into the applications of food contact laminated materials; examination of migration potential and recommendations for safe use	RAPRA

ANNEX II: RESEARCH PROPOSALS PUBLISHED IN ISSUE 6 OF THE FOOD STANDARD AGENCY'S REQUIREMENTS DOCUMENT

The effects of storage, temperature, damage and cooking on the migration of bisphenol A from can coatings.

Little is known about the effects on bisphenol A migration from can coatings, of long term storage, temperature, damage and cooking food inside cans. Further work is required to determine the effect of these parameters, both individually and in combination, on the levels of migration of this compound from can coatings into both foods and food simulants.

Migration of bisphenol A from polycarbonate plastic food contact materials and articles

Bisphenol A is used to make polycarbonate plastics. This material, noted for its toughness, is used in a range of food contact applications, including large water bottles, baby bottles, microwave ovenware, mugs and pitchers, tableware and storage containers. The European Union (EU) specific migration limit is currently 3 mg/kg of food for bisphenol A used in plastics in contact with food. The Tolerable Daily Intake is being reviewed by the Scientific Committee on Food.

To ensure consumer protection, work will be undertaken to determine the levels of migration of bisphenol A from polycarbonate food contact materials and articles, during normal conditions of use. Methodology defined in law for migration testing will be used. Previous research has developed a robust method of analysis for this substance. This research should provide valuable information to aid the review of this substance in the EU.

LC-MS method development for the screening of nonvolatile and polar compounds present in paper and board and plastic food contact materials

There is a continued need for simpler and improved methods for characterisation of materials and migration measurements, it is important that a means exists to identify and quantify 'unknowns'. Advances in LC-MS techniques have led to a rapid increase in the use of this technique for nonvolatile and polar compounds, but the transfer of established LC-UV methods to LC-MS is not always straightforward in terms of mobile phase compatibility. The purpose of this proposal is to produce LC-API-MS methods for the determination of a suite of 'difficult' compounds, identified as possible migrants from paper & board & plastics, at low detection levels. These methods would then be modified for transfer to particle beam LC-MS such that both techniques (LC-API-MS & LC-PB-MS) could be used in combination for the screening and identification of unknowns.

An investigation of the breakdown products of curatives and antidegradants used to produce food contact elastomers

The chemistry of rubber formulations is complex. Because of the reactive nature of these materials, the compounds present in finished rubber materials may include breakdown products and cross-reactants of the starting ingredients. It is believed that, in particular, curatives and antidegradants used in food contact elastomers may be particularly likely to react. The reaction products may migrate.

This project would entail theoretical prediction of the breakdown products and curatives in relation to a draft Council of Europe Inventory list, followed by practical work to test if reaction products actually migrate.

Active packaging - current trends and potential for migration

Work is needed to define and evaluate the size of the market currently occupied by active packaging, the type of packaging involved, the active ingredient(s) and also the types of food packed in this way. Based on the results of this study, analytical work might be undertaken to determine the levels of potential migrants in the packaging and the levels migrating during normal conditions of use and under worst case scenarios.

Investigation of the nature and extent of biodegradable polymers in direct food contact applications

Developments in biodegradable materials are now beginning to make the use of these polymers for food packaging a practical reality. A number of European projects have been undertaken in this area. However, no projects have been reported which specifically address the identification of possible migrants and testing requirements for biodegradable food contact materials. This therefore remains an outstanding need, as these materials are likely to be used more widely.

Use of food packaging in the home

Market research on the use and re-use of food contact materials in the home is required. Information is sought on the use of packaging in domestic situations including transport, storage (ambient, refrigerated, and frozen), food preparation, cooking and food presentation. The research should provide information on the uses of packaging in situations other than those for which it may have originally been intended. Subject to information from this market research a further project then would investigate the effect of such use on chemical migration.

ANNEX III: PROPOSALS FOR PROJECTS FOR POSSIBLE COMMISSIONING IN FY 2003

Substances migrating from ion-exchange resins

Ion-exchange and adsorbant resins may be used in the processing of some foodstuffs or their ingredients. There is currently a draft proposal to amend the framework directive for materials and articles intended to come into contact with foodstuffs (89/109/EEC) to include the whereas clause: "The ion-exchange resins should be considered materials and articles intended to come into contact with foodstuffs, and therefore should be added to the lists of materials to be regulated". This suggests that in the future ion exchange resins might be counted as food contact materials. It is envisaged that investigations are required to determine the nature and extent of substances migrating from ion-exchange resins as a basis for establishing future controls.

Latex protein as a potential migrant from food contact materials

There is some evidence that latex protein is transferred to food during handling by processors wearing latex gloves¹. There are also two published case studies of an allergic reaction in latex sensitised people². This might be considered by some to be only a small amount of evidence. But others would point to this representing a real problem for some consumers. What are the Working Party's views? Should further work to study the transfer of latex protein be undertaken, or should this possibility be addressed legislatively in that alternatives to latex gloves are fairly readily available?

Use of basketware as a food contact material?

Baskets made from straw or willow are used for bread, cakes, fruit, and sweets, both in the home and in cafes & restaurants. The project on wood doesn't include willow. Has any work been done on possible chemical migrants from this wood or from straw? Baskets can be manufactured both on a small scale for craft fares and on a large scale for purchase from department stores.

¹ Beezhold D.H., Reschke J.E., Allen J.H., Kostyal D.A. and Sussman G.L. Latex protein: A Hidden "Food" Allergen? Allergy & Asthma Proc., 21, 5, 2000

² Schwartz H.J. Latex: A potential hidden "food" allergen in fast food restaurants.

ANNEX IV: STRATEGIC OUTLOOK ON FSA-FUNDED RESEARCH ON MATERIALS AND ARTICLES IN CONTACT WITH FOOD

LIKELY POLICY NEEDS FOR RESEARCH OUTPUTS IN NEXT 5 YEARS

Part 1: By type of material:

	Policy need	Main focus	Info. Available now	Net need for new information 2001 - 2006
Paper & board	++++	Council of Europe (CoE)/EU	+++	+
Laminates/ coatings	+++	CoE	++	+
Elastomers	+++	CoE	++	+
Adhesives	+++	UK	++	+
Recycled packaging	+++	EU/CoE	++	+
Plastics	++++	EU	+++	+
Inks	++	CoE	+	+
Secondary packaging	++	UK	+	+
Kitchenware	++	UK	+	+
Wood	++	CoE	+	+
Glass	++	UK	+	+
Ceramics	++	UK	+	+
Cork	++	CoE	++	NIL
Metals/alloys	+	CoE	+	NIL

Part 2: By main area of policy work:

Council of Europe (CoE)	++
UK	++
European Union (EU)	++
Codex Committee on Food Additives & Contaminants	NIL
Bilateral relations with countries outside Europe	+

Part 3: By type of research output:

More cost-effective methods of protecting consumers	++++
Increasing awareness by industry sectors that they need to control chemical migration	+++
Stimulating/helping review processes	++
New analytical methods	++