

Proposed activity for year four of the four-year surveillance programme for chemical migrants from food contact materials:

The migration of selected ink components from printed packaging materials into foodstuffs

The Food Standards Agency has an on-going 4 year rolling programme of surveys on migrants from food contact materials and articles. To date work undertaken in this series includes:

Migration of formaldehyde and hexamethylenetetramine, expressed as formaldehyde, from melamine-ware (Food Survey Information Sheet (FSIS) 04/08).

Migration of primary aromatic amines from nylon kitchen utensils (FSIS 01/10).
Measurement of aluminium and other metal concentrations in foods packaged in aluminium-containing materials or articles (FSIS in preparation).

The fourth survey in this series is now planned and it is intended that this will be on the migration of selected ink components from printed packaging materials into foodstuffs.

Purpose and Objectives

This four year rolling survey is part of Research Programme A03 – Chemical Contaminants from Food Contact Materials. The information generated by this programme is used to help provide an evidence base for the Agency's work on contamination of food by chemicals that may migrate from packaging, cookware, and other materials and articles that are intended to come into contact with foodstuffs. The programme's requirements fit into the Agency's current strategic plan under the Food Safety target – that food produced and sold in the UK is safe to eat.

(<http://www.food.gov.uk/multimedia/pdfs/strategy20102015.pdf>).

The programme helps to develop Food Standards Agency policy in this area, including the need for relevant controls to ensure that any chemical migration does not pose a risk to consumers' health and proposals for any research or further targeted surveillance. All of the results of this research and survey programme are published. Information derived from the programme is circulated widely to stakeholders.

The purpose of this latest survey is to study the migration of selected ink components such as photoinitiators and plasticisers from printed food-packaging materials into foodstuffs. Even though inks and lacquers are applied to the outside of packaging materials, low molecular weight substances such as photoinitiators and plasticisers may permeate through the material and subsequently migrate to foods. They may also transfer via set-off, which is the unintentional transfer of ink from a printed surface to another surface in contact with it (e.g. on a reel or in a stack). The final list of substances to be monitored will be agreed with the Agency based on use of these substances, a review of the

scientific literature and evidence of them as potential or established migrants. A maximum of 20 substances will be included.

It is intended that 350 foodstuffs packaged directly or indirectly in printed cartonboard will be purchased from retail outlets in the UK. In addition work will be undertaken to determine the occurrence of mineral hydrocarbons in some of the printed cartonboard packaging materials. Mineral oils are commonly used in inks used in newspaper printing and if foods are packaged in cartonboard prepared from recycled fibres (containing newspaper recyclate) then there may be the potential for them to migrate to the foods. This will include 50 samples of recycled and 20 samples of virgin printed cartonboard for comparison. If the presence of MHCs is found to be a problem then a follow-up survey on their migration into foods may be commissioned.

Background

Printing inks are not subjected to specific legislation at EU level, however as a final component of a packaging material they must meet the requirements of the Framework Regulation (EC) No 1935/2004 and should be used according to the rules laid down in Commission Regulation (EC) No 2023/2006 on Good Manufacturing Practice (GMP), Annex I of which specifically deals with printing inks. Thus for printing inks applied to the non-food contact side of a material or article GMP should in particular ensure that substances are not transferred into food by set-off or transfer through the substrate.

Mineral oils are commonly used in inks used in newspaper printing. If foodstuffs are packaged in cartonboard prepared from recycled fibres (containing newspaper recyclate) then these MHCs may be present and have the potential to migrate into the packaged foodstuffs. The use of mineral hydrocarbons in plastic packaging materials is subject to Commission Directive 2002/72/EC as amended, relating to plastic materials and articles intended to come into contact with foodstuffs. However, these controls do not cover cartonboard packaging materials, these materials are again covered by the Framework Regulation 1935/2004.

Substances should not transfer or migrate from printed surfaces into foods, however in recent years foods have been contaminated with some such substances (isopropyl thioanthone (ITX) and benzophenone for example). This survey will look at a suite of possible migrants and help to provide evidence that consumers are protected from such contamination or underpin any food safety action that the Agency may need to take to prevent such transfer/migration from taking place.

Survey design

Analytical multi-method(s) will be developed for the determination of the selected printing ink compounds in cartonboard and foodstuffs and for the determination of saturated and aromatic mineral hydrocarbons in cartonboard. Packaging samples will be screened by one or both of Gas Chromatography-Mass Spectrometry (GC-MS) and Liquid Chromatography-Time of Flight (LC-TOF)-MS depending on the selected analytes. The method used for targeted analysis of the foodstuff will be either GC-MS or LC-MS/MS depending on the analyte and matrix. In-house reference materials will be used and validation data derived in accordance with the harmonised IUPAC guidelines for single-laboratory validation of methods of

analysis and the EU report 'Performance Criteria and Validation Procedures of Analytical Methods used for Compliance and Controls of Food Contact Materials' prepared within the EURL-NRL network. The survey will only commence after a satisfactory blind check exercise has been carried out.

The sampling plan will be agreed in accordance with the Agency's survey guidelines. 350 foodstuffs packaged in printed paper/board containing materials will be purchased, including at least 50 recycled materials. Samples will be purchased from major supermarket chains and independent outlets across the UK, taking into account regional variability. Foods packaged directly in printed paper and board or recycled paper and board, as well as foods for which printed paper and board or recycled materials are present in the form of secondary packaging (i.e. not in direct contact with the foodstuff), will be included. Samples with a known functional barrier between the printed packaging and the food will be avoided.

All foodstuffs where the selected ink components are detected in the associated packaging materials at a level of potential migration interest will be analysed. The worst case migration will be calculated as 100% transfer of that measured from the packaging to the food. Foods will only be analysed for the specific printing ink compound(s) detected in the associated packaging.

Sample purchase should begin in spring 2011, with the findings published in late summer 2011.