

Bio-based materials used in food contact applications

Area of research interest: [Chemical hazards in food and feed](#)

Study duration: 2008-11-01

Project code: A03070

Conducted by: Central Science Laboratory

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Background

The use of biodegradable packaging and consideration of chemicals that could migrate into food was studied in an Agency-commissioned project (A03040), published in 2004. In recent years developing interest in sustainability has led to a major increase in the use of bio based materials in food contact applications. As development in this area continues it is still necessary for all materials being used to have been manufactured in such a way that they comply with the Framework Regulation (EC) No 1935/2004 for materials and articles in contact with food, that is, that they should not transfer their constituents to food in quantities that could endanger health, bring about an unacceptable change in the composition of the food or bring about a deterioration in the organoleptic properties of the food.

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Research Approach

A literature review was prepared describing the results of scientific studies previously carried out on these materials as well as establishing current usage and market share. In addition, analytical work was undertaken to identify possible migrants and assess migration potentials of individual substances and the overall migrate. Data generated from the specific migration of selected substances into foods and food simulants were compared. The applicability of the overall migration test methods for biobased materials was also assessed.

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Results

The identities of any potential migrants in the biobased materials were determined using a suite of analytical methods. Following a consideration of the nature of the substances and restrictions in the legislation placed on their use in food contact materials, migration studies were carried out into foods and food simulants for selected substances. These substances included oligomers (short chains of monomers that go to form polymer plastics), alkanes and fatty acids, which are expected breakdown products from organic derived plastics and plant based materials. Food simulants are used in the laboratory to provide a conservative estimate of the amount of individual substances that may migrate from packaging into food.

As paper/board food packaging materials are well established, and the migration from these materials has already been studied (for example, our project A03021 on chemical migration from recycled paper and board), they were not included in the scope of this project.

In one of our earlier projects, A03040, investigating the nature and extent of biodegradable polymers used in direct food contact applications, it was noted that 'The methods of test for migration, using food simulants, are likely to be directly applicable to testing most biodegradable polymers....'. The current project confirmed that this was correct. Where migration was observed, the simulants either approximated or overestimated the expected migration into foods. However, materials sensitive to humidity which were tested in an olive oil simulant needed to be dried first.

The main conclusion of the study is that there was little measurable migration from the materials tested.

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Additional Info

Agency-funded research A03040: 'Investigation of the nature and extent of biodegradable polymers in direct food contact applications' may be found at the link below

Research report

England, Northern Ireland and Wales

PDF

[View Biobased materials used in food contact applications: an assessment of the migration potential as PDF\(Open in a new window\)](#) (3.3 MB)

England, Northern Ireland and Wales

PDF

[View Investigation of the nature and extent of biodegradable polymers used in direct food contact applications as PDF\(Open in a new window\)](#) (197.15 KB)