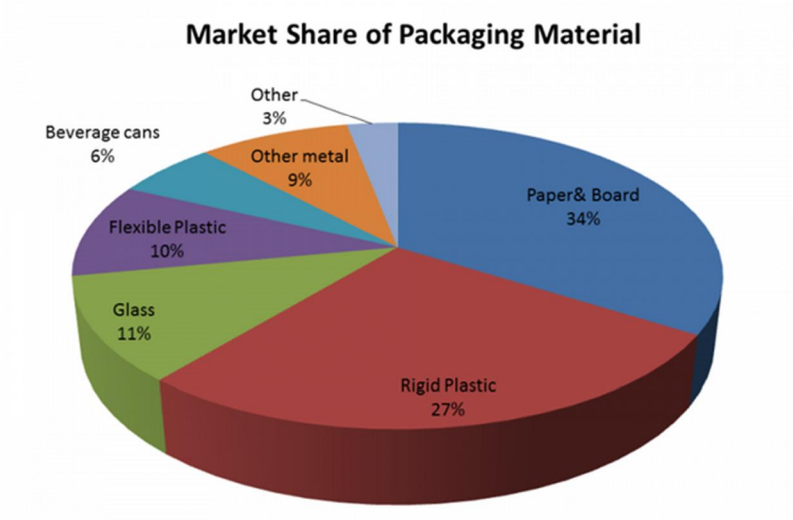
Food Packaging and health

Food Packaging Materials

Food packaging protects foodstuffs, but it can also be a source of chemical food contamination. The layer that is in direct contact with the foodstuff is called "food contact material". Various different types of food contact materials are commonly used, each with different properties.

Packaging for foodstuffs comes in many different forms, based on technical requirements throughout the supply chain, as well as marketing needs (like brand identity or consumer information) and other criteria. The layer that is in direct contact with the food or beverage is called “food contact material”.

October 5, 2012 Jane Muncke



For some types of food packaging the food contact material determines the name: a plastic bottle is made of plastic and has this material type in direct contact with the foodstuff. For glass jars the materials in contact with the foodstuff are glass and coated metal from the closure. In the case of beverage cartons the direct food contact layer is not carton, but laminated plastic. For aluminum cans a coating is in direct contact with the beverage. Some types of paper can also be coated (for example with a grease-proof coating).

The term food contact material applies to food (and beverage) packaging, but also to any other materials that come into contact with food, either during storage, processing and filling, or consumption (like cooking utensils).

In general, any food contact material should not release chemicals into the food at quantities that can harm human health.

Paper and board Material

Paper and board are versatile materials used to package foods. Paper packaging can e.g. be made of parchment paper or have the shape of bags to package loose foods. Carton board is commonly used for e.g. liquid and dry foods, frozen foods and fast food. Corrugated board finds broad application in direct contact with food (e.g. pizza boxes) and as secondary packaging.

Paper and board are made of natural fibers of bleached or unbleached cellulose or are, alternatively, recycled from recovered materials. Chemical additives are needed in the manufacture of paper and boards to achieve different technical functionalities. They are either added to the pulp during production or coated onto the surface afterwards. Additives can be mainly categorized into functional additives and processing aids. The first group of additives is used to modify the properties of the paper. They typically remain in the paper and include sizing agents, wet and dry strength resins, softeners, dyes, and pigments. Processing aids are used to improve the paper making processes and are not, or only in traces, transferred into the final product. Common processing aids are defoamers, biocides, felt cleaners, and deposit control agents.

Paper and carton are permeable barriers. Especially low molecular weight and volatile additives, but also non-volatile compounds and external contaminants can migrate from and through the packaging into the food. Well-known migrants from paper and board include mineral oils, photo initiators, phthalates, and per- and poly fluorinated substances.

Recycled paper and board often contain mineral oils and many other substances which may migrate into foods at levels exceeding safe thresholds. The source of these contaminants is usually the “raw” material, i.e. the recovered paper and board treated with various chemicals, many of which are not intended to come into contact with food, or which exceed acceptable levels. Although recycling of paper and board is essential for a society aiming at the circular economy, the safe use of paper and board for FCMs remains a challenge: The identification and toxicological assessment of the migrants from recycled paper and board was judged to be unrealistic. Additionally, each manufacturer may produce a new cocktail of migrants with each new batch of recycled paper and board. After this topic was brought to public awareness in 2011, many food companies stopped using recycled paper and board and switched to materials made from virgin fibers. Alternatively, functional barriers can be used to reduce the migration from recycled paper

and board into food. Such barriers can either be integrated into an internal plastic bag or coated onto the internal surface of the paperboard box.

In Europe, food contact materials are generally regulated under the EU Framework Regulation EC 1935/2004 on materials and articles intended to come into contact with food, which allows for further regulation being made on paper and board materials. Up to this date no specific regulation on paper and board food contact materials has been enacted under European Community law. In 2002, Resolution ResAP(2002)1 on paper and board materials and article intended to come into contact with foodstuffs was adopted by the Council of Europe (CoE). However, the Report of the EFSA Scientific Cooperation (ESCO) Working Group on non-plastic Food Contact Materials includes an inventory list of substances used in non-plastic food contact materials, including paper and board. While this report may be used to inform other panels within EFSA, it does not aim to produce a Scientific Opinion, which could inform action by the European Commission. In 2012, a voluntary Industry Guideline for the Compliance of Paper and Board Materials and Articles for Food Contact was published by the Confederation of European Paper Industries (CEPI) and the International Confederation of Paper and Board Converters in Europe (CITPA). In 2015, the German Federal Institute for Risk Assessment (BfR) released a recommendation on paper and board in contact with food.

In the U.S., paper and paperboard components are regulated as indirect food additives under the Code of Federal Regulation (21 CFR 176). Alternatively, food contact substances used in paper and board may also be acknowledged by an effective Food Contact Substance Notification (FCN). Substances that have been affirmed as Generally Recognized as Safe (GRAS) for use in food packaging, subject of the Threshold of Regulation (ToR), or sanctioned prior to 1958 are exempted from regulation.

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