

# It's Not the Bean, It's the Bag

Understanding regulations can help protect products from “off” odors and tastes caused by packaging materials.

By Joseph Spinnato, PhD

**A**flatoxin B1. Ochratoxin A. Klebsiella. Enterobacter. The industry pays plenty of attention to the natural contaminants in coffee and tea that may affect quality. However, not everyone in the industry is paying attention to potential man-made contaminants that could migrate from food packaging materials and affect the taste and odor—called organoleptic properties—of products. But companies should be, because regulators are, and because a product problem could lead to a recall that will hurt the bottom line and the brand.

The U.S. Food and Drug Administration (FDA), in Section 402(a) of the Federal Food, Drug and Cosmetic Act, requires industries to avoid adulteration. Adulteration, according to the Act, is defined as a food additive (intentionally or unintentionally added) that makes the food unsafe or *unfit for consumption*, i.e., affects the taste, odor or appearance. This is reiterated in Section 174.5 of Title 21 of the Code of Federal Regulations (21 CFR § 174.5). In Europe, there is similar legislation. The Council of the European Communities in Article 3 of Regulation (EC) No 1935/2004, also known as Article 3 of the Framework Regulation, requires that all materials and articles be manufactured according to Good Manufacturing Practices (GMP). GMP requires that food packaging materials and articles do not transfer components to the food which could:

- endanger human health,
- bring about an unacceptable change in the composition of the food, and
- bring about a deterioration in the organoleptic characteristics of the food.

In addition to Europe and the U.S., China, the MERCOSUR nations (Brazil, Argentina, Paraguay, Uruguay, and

Venezuela), Canada and other countries, have laws mandating that food should not be adulterated by the food package, which would include imparting a taste or odor.

The question should be asked, what are the potential sources of a package that can affect the taste or odor of coffee and tea? Coffee and tea are packaged in a variety of materials such as metal, plastic, paper and flexible films. Then these “base materials” are further modified with coatings, inks, adhesives and overprint varnishes. Flexible food packaging can contain hundreds of individual chemical



components. Any of these materials could potentially transfer organoleptic constituents. Examples of the potential contaminants include unreacted monomers, residual solvents, manufacturing by-products, and photoinitiators used in the manufacture of ultraviolet-cured coatings, varnishes and laminating adhesives.

The majority of taste and odor issues are due to the migration of chemicals from the package into the food. To avoid the transfer of organoleptic properties to the food, the entire food packaging supply chain must be involved. The obvious first step is to avoid materials already known to

affect taste and odor. Manufacturers should also use materials which are less likely to migrate, e.g. multifunctional monomers, higher molecular weight materials, and other materials which are likely to stay bound to the polymer matrix.

It is also critical that manufacturers follow GMP. GMP that reduce the likelihood of adulteration could include 1) using highly purified raw materials, 2) monitoring the material to ensure it cures, 3) using manufacturing and processing fluids that are “food grade,” and 4) using equipment dedicated to food packaging. Another option is to test the material for potential taste and odor issues. ASTM (American Society for Testing and Materials) has developed several standard test methods to determine the transfer of taste and odor from package materials.

The U.S. and Europe require that food packaging manufacturers not supply products that can affect taste and odor of the food. There are many types of materials which can potentially impact a food’s organoleptic properties. Therefore, it is critical that the food packaging supply chain understand which materials can possibly influence the taste and odor of the food and implement practices and procedures that avoid adulteration. ☞

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