

Safety Evaluation of Post-Consumer Recycled PET Materials in Chilean Industry by Overall Migration Tests

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Abstract : One of the biggest problems in food packaging industry, especially with the plastic materials, is the fact that these materials are usually obtained from non-renewable resources and also remain as waste after its use, causing environmental issues. This is an international concern and particular attention is given to reduction, reuse and recycling strategies for decreasing the waste from plastic packaging industry. In general, polyethylenes represent most plastic waste and recycling process of post-consumer polyethylene terephthalate (PCR-PET) has been studied. US Food and Drug Administration (FDA), European Food Safety Authority (EFSA) and Southern Common Market (MERCOSUR) have generated different legislative documents to control the use of PCR-PET in the production of plastic packaging intended direct food contact in order to ensure the capacity of recycling process to remove possible contaminants that can migrate into food. Consequently, it is necessary to demonstrate by challenge test that the recycling process is able to remove specific contaminants, obtaining a safe recycled plastic to human health. These documents establish that the concentration limit for substitute contaminants in PET is 220 ppb (ug/kg) and the specific migration limit is 10 ppb (ug/kg) for each contaminant, in addition to assure the sensorial characteristics of food are not affected. Moreover, under the Commission Regulation (EU) N°10/2011 on plastic materials and articles intended to come into contact with food, it is established that overall migration limit is 10 mg of substances per 1 dm² of surface area of the plastic material. Thus, the aim of this work is to determine the safety of PCR-PET-containing food packaging materials in Chile by measuring their overall migration, and their comparison with the established limits at international level. This information will serve as a basis to provide a regulation to control and regulate the use of recycled plastic materials in the manufacture of plastic packaging intended to be in direct contact with food. The methodology used involves a procedure according to EN-1186:2002 with some modifications. The food simulants used were ethanol 10 % (v/v) and acetic acid 3 % (v/v) as aqueous food simulants, and ethanol 95 % (v/v) and isooctane as substitutes of fatty food simulants. In this study, preliminary results showed that Chilean food packaging plastics with different PCR-PET percentages agree with the European Legislation for food aqueous character.

Keywords : contaminants, polyethylene terephthalate, plastic food packaging, recycling

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