

SURVEILLANCE OF BISPHENOL A AND PHTHALATES IN MATERIALS IN CONTACT WITH FOOD AND CHILDREN TOYS IN CYPRUS*

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In recent years a variety of chemicals have been found to disrupt the endocrine systems, and there is strong evidence that chemical exposure has been associated with adverse developmental and reproductive effects on fish and wildlife in particular locations. Bisphenol A (BPA) and 6 phthalate esters (DEHP, DBP, BBP, DINP, DIDP, DNOP) are among a number of chemicals that may have the potential to interact with hormone systems in the body. BPA is an organic compound used to make polycarbonate plastic and epoxy resins, along with other applications. The phthalate esters are another class of chemicals that are mainly used as plasticizers (substances added to plastics to increase their flexibility, transparency, durability, and longevity). They are used primarily to soften polyvinyl chloride (PVC) which is used in a variety of industrial product applications.

According to the EFSA's opinion of 2006, polycarbonate feeding bottles are the main source of exposure to BPA for infants. Taking into account this opinion, EU Commission took a preventive measure regarding the use of BPA in polycarbonate infant feeding bottles on the basis of the precautionary principle and put into force Regulation (EU) No 321/2011 (amending EU Regulation No 10/2011 for plastic food contact materials) as regards the restriction of use of Bisphenol A in plastic infant feeding bottles.

The purpose of the surveillance (conducted during 2003-2010) was to investigate: (i) the presence of BPA in polycarbonate plastics such as: baby feeding bottles, bottles of water, cans with epoxy resin coating, (ii) the levels of phthalate esters in cling films, gaskets and soft children toys made of PVC material and (iii) their compliance to the relevant legislation.

The sampling was performed by the relevant Competent Authorities [(i) Public Health Inspection Services- Ministry of Health for BPA via Regulation (EU) No 321/2011 and Regulation (EU) No 10/2011 and (ii) Department of Labour Inspection, Ministry of Labour and Social Insurance for phthalate esters via REACH Regulation 1907/2009] in big stores and the market. In some cases, a combination of both random and target-oriented sampling was performed. The design of the sampling plan was based upon violations from the relevant legislation and previous known problems, prioritization of the risk, information from the EU RASFF and RAPEX System,

frequent used articles and toys by the consumers and especially higher risk population groups (e.g. children).

The determination of BPA was performed by an accredited method, using High Pressure Liquid Chromatography and a UV detector (HPLC-UV) at 280 nm. In case of non compliant samples, the presence of BPA was confirmed by another detector (fluorescence, FLD). Phthalate esters were determined using HPLC –UV and their presence was confirmed by Gas Chromatography coupled with Mass detector (GC-MS) using full scan and sim mode analysis.

The results of the surveillance for feeding bottles, cans and water bottles for BPA during 2003-2010 showed that all samples were compliant with the requirements of the relevant legislation, with almost no detectable levels of BPA < 15kg/L (SML=0, 6 mg/kg).

The results of the analysis for the specific migration of phthalate esters in cling films during 2005-2008 showed that all samples were compliant with the requirements of the relevant legislation. For gaskets the results showed that the percentage of non compliant samples (for DEHP and DINP) was 7% and 25% for 2008 and 2009, respectively.

The results for phthalate esters in children toys during 2008-2010 showed that the percentage of non compliant samples was significantly high and ranged between 10-61% (61, 50, and 10% for 2008, 2009 and 2010, respectively). In particular, the levels ranged between 0.12-31.7% w/w for DEHP, 0.4-48% w/w for DINP and 0.12-6.4% w/w for DBP and the maximum permitted limit is 0.1% w/w. All the non compliant samples originated from third countries (China, Taiwan etc).

The results indicate the need of constant surveillance and control especially for phthalates esters in PVC children toys and gaskets in the market. The results are notified to the Competent Authorities for taking the appropriate measures, i.e. withdrawal from the market, information of consumers and notification to the relevant rapid alert systems in the EU (RASFF and RAPEX), according to the requirements of the relevant legislation.

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