Review On Analysis Of Bisphenol A Diglycidylether (Badge) In Canned Food

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ABSTRACT: Objective: diglycidyl ether of bisphenol A (DGEBA) is constantly discharged at trace levels in food packed in metal cans with PVC lining. This represents a cause for concern because of potential effects of bisphenol a to human health. We compiled data on the analysis of diglycidyl ether of bisphenol A (DGEBA) in canned food published in the last 10 years. **Data sources:** Google Scholar, Pubmed and Medline, Journal of agriculture and food chemistry website, EHP website were used to search for articles published in peer-reviewed journals written in the English language since 1999. **Data extraction:** Information on diglycidyl ether of bisphenol A (DGEBA) concentrations in canned food the source of contamination, method used for analysis, detection limits , year of publication and method of analysis was extracted. **Conclusions:** Detrimental effects of diglycidyl ether of bisphenol A (DGEBA) on human beings are possible with the constant exposure through canned food. Indirect impact on human health from canned food cannot be ruled out when considering the potential risk of diglycidyl ether of bisphenol A (DGEBA). [Researcher. 2009;1(4):90-92]. (ISSN: 1553-9865).

KEYWORDS: Canned food, Bisphenol A, Food , diglycidyl ether of bisphenol A (DGEBA)

INTRODUCTION

Glycidyl ethers are basic components of epoxy resins which have been commercially available. Bisphenol A diglycidyl ether and its oligomers are major components of epoxy resins. Other glycidyl ethers, including phenyl glycidyl ether, are frequently incorporated into epoxy resin systems as reactive modifiers. Epoxy resins based on bisphenol A diglycidyl ether are widely used in protective coatings, including paints, in reinforced plastic laminates and composites, in tooling, casting and moulding resins, in bonding materials and adhesives, and in floorings and aggregates. Occupational exposure to bisphenol A diglycidyl ether may occur during its production, during the production of epoxy products and during various uses of epoxy products, but data on exposure levels are sparse [IARC, 1989].

John E. Biles et al [1999] reported migration of the diglycidyl ether of bisphenol A (DGEBA) to food from can coatings. Derivatives of DGEBA were also determined in some foods. Levels of DGEBA in the foods range from non-detected (<0.3 ppb) to 50 mg/kg. It was determined by liquid−liquid extraction or solid-phase extraction coupled with high-pressure liquid chromatography with fluorescent detector. Theobald A et al [2000] quantified levels of bisphenol-F-diglycidyl ether (BFDGE as part of a European survey on the migration, into oil from canned fish, of residues of epoxy resins. The analysis was performed using reverse phase HPLC with fluorescent detector. BFDGE could be detected in 12% of the fish, 24% of the cans and 18% of the lids. Only 3% of the fish contained BFDGE in concentrations above 1 mg/kg.

Hammarling L et al [2000] investigated the presence of BADGE and the chlorohydroxy compounds (BADGE.HCl and BADGE.2HCl) in various kinds of canned foods by HPLC with fluorescent detector. BADGE was found in levels up to 5.1 mg/kg in the food. The results indicated that the migration of BADGE.HCl and BADGE.2HCl, compounds with almost no data on toxicity, implies a greater problem than BADGE.H2O and BADGE.2H2O.

Berger U et al [2001] investigated a reversed phase high performance liquid chromatographic method combined with fluorescent and mass spectrometric detector in series was presented for the separation and quantification of bisphenol A diglycidyl ether (BADGE) and novolac glycidyl ether (NOGE) derivatives in food can coatings, tuna and oil. The highest values found were 20 micrograms/g in tuna and 43 micrograms/g in the oil phase.

Simoneau C et al [2002] investigated the migration of bisphenol-A-diglycidyl-ether (BADGE) into vegetable oil from processed and non-processed cans as a function of the process treatment and the temperature of storage. The results revealed that temperature processing had the largest effect on migration of BADGE. Storage temperature also affected migration from non-processed cans. The results of migration at higher temperatures were also correlated to the potential degradation of BADGE from oxidation products.

Leepipatpiboon N et al [2005] developed and validated a gradient reversed-phase liquid chromatographic method with fluorescence detection for bisphenol-A-diglycidyl ether (BADGE), bisphenol-F-diglycidyl ether (BFDGE). The method detection limits were 0.72-4.20 ppb and the method quantitation limits were 2.40-14.85 ppb. The validation data indicate excellent precision, acceptable recovery, and good robustness. This supports a good potential to further develop a standard method for the determination of migrations from interior can coatings into foodstuffs.

Petersen H et al [2008] elucidated the fate of BADGE and identified Food proteins as the main reaction partner with BADGE. The hydrolysis and hydrochlorination derivatives subject to European legislation make up only a fraction of the totally migrated BADGE.

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