The Analysis of Laboratory and Consumer Water Sources for the Presence of BPA and Phthalates

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Abstract

The goal of the present study was to examine the phthalate and bisphenol A (BPA) levels of several popular commercial bottled waters in comparison with municipal tap water and various samples of laboratory water from commercial sources and from de-ionized filtration systems. In addition, the study attempted to discover whether the phthalate and BPA levels increased after being heated one week at temperatures equivalent to those reached inside an automobile during the summer (60° C). Samples were extracted and tested for phthalate and BPA levels by GC-MS. The concentration of phthalates and BPA found in all the commercially bottled water samples and the municipal water sources were either non-existent or well below EPA RfD (oral reference dosage) guidelines. The EPA, defines the RfD as: '…an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. The RfD is generally expressed in units of milligrams per kilogram of bodyweight per day (mg/kg/day).' In addition, the exposure of bottled water to heat did not significantly increase the concentration of phthalates. BPA was not detected in any of the bottled water or municipal water sources. The water samples taken from consumer Point-of-Use (POU) systems varied greatly in the level of phthalates and BPA depending on the type of system and the amount of water flushed from the system prior to the sample being taken. Samples taken from a stationary POU system had increased levels of phthalates compared to samples taken after the stationary water was flushed from the system. Samples taken from one of the POU systems were found to contain small amounts of BPA, well under the guidelines of the EPA's RfD.

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