

# Rotisserie Chicken

## GOALS

The goals of this project were to:

- Assess the levels of plastic and food packaging chemicals—bisphenols, phthalates, phthalate replacements, and PFAS—in the packaging and meat of grocery store rotisserie chickens from 10 popular supermarkets, club stores, and big-box stores.
- Assess the health risks to children and adults from the dietary intake of these chemicals from rotisserie chicken, using the most health-protective limits.
- Determine the sodium content of the chickens and compare the analyzed levels with the values declared by the manufacturer on product labeling or on the official website.
- Weigh purchased whole chickens and compare the weights with the declared net weight on the package label.
- Evaluate the flavor and texture of the rotisserie chickens.

## TEST APPROACH AND METHODS

We purchased 10 to 13 rotisserie chickens from each retailer, each in its original packaging, for our tests.

All samples purchased from each retailer were weighed to obtain an average weight per bird.

Two samples of each chicken and its packaging materials were sent to an accredited laboratory for testing. The chickens were purchased from two unique store locations on two separate occasions. The samples were prepared and analyzed in accordance with the following methods:

- Bisphenol screen (BPA, BPF, and BPS) - J. Chromatogr. A 1306 (2013): 44-5/LCMSMS

- Phthalate Screen by GC-MS/MS based on GB 5009.271-2016
- Sodium by ICP-OES based on AOAC 2011.14
- PFAS by LCMSMS FDA CAM version 010.03 Mod.

We reviewed all the test results and quality control data provided by the contract lab for accuracy and clarity, and checked for errors.

Three of the samples were tasted by CR's sensory experts. These samples were purchased from up to three unique store locations on three separate occasions. Samples were kept warm in insulated coolers and delivered to CR's headquarters for testing, and the chickens were blind tasted upon arrival. Other samples were used for photography or frozen and kept for reference.

## DATA ANALYSIS

We determined the average of phthalates and phthalate replacements in the two samples tested from each retailer. We defined total phthalates as the sum of average concentrations of BBP, DBP, DiBP, DCHP, DEP, DEHP, DnHP, DMP, DiNP, and DNOP.

To estimate the average concentration of a bisphenol, phthalate, or phthalate replacement in a product, we applied a method used by many risk assessors,<sup>1</sup> including the Environmental Protection Agency.<sup>2</sup>

If a PFAS, bisphenol, phthalate, or phthalate replacement was measurable above the method reporting limit (MRL) in any of the samples of the product, the samples that had measurable test results below the MRL were assumed to have a concentration of half the MRL for that bisphenol, phthalate, or phthalate replacement.

<sup>1</sup> Jianping Xue, Valerie Zartarian, Sheng-Wei Wang, et al., "Probabilistic Modeling of Dietary Arsenic Exposure and Dose and Evaluation with 2003-2004 NHANES Data," *Environmental Health Perspectives*, 118, no. 3 (2010): 345-350.

<sup>2</sup> "Regional Guidance on Handling Chemical Concentration Data Near the Detection Limit in Risk Assessments," *Environmental Protection Agency*, <https://www.epa.gov/risk/regional-guidance-handling-chemical-concentration-data-near-detection-limit-risk-assessments>.

If the bisphenol, phthalate, or phthalate replacement was not measurable in any of the samples tested of the product, we assumed a concentration of zero for all the samples of that product for the bisphenol, phthalate, or phthalate replacement. This approach to risk assessment appropriately considered important uncertainties about potential levels of undetected risk in samples with test results below the MRL.

### RISK ASSESSMENT

We estimated a U.S. child's (20 kg, or 44 pounds) and adult's (70 kg, or 154 pounds) intake of the tested bisphenols and phthalates from a serving of each product and, where appropriate and applicable, compared the intake estimates with the exposure limits in the table at right.

### NUTRITIONAL ASSESSMENT

The sodium values from our test were compared with the levels listed on the Nutrition Facts panels on the product packages or provided by the manufacturer when available.

Health-Based Exposure Limits Selected for Risk Assessment				
Chemical	EPA RfD ug/kg bw/d	EFSA TDI ug/kg bw/d	ECHA RfD ug/kg bw/d	Lowest intake associated w/endpoints of concern ug/kg bw/d
BPA	50	0.2	N/A	N/A
BBP	200	500	500	0.06 - 0.58
DBP	100	10	6.7	0.19 - 2.86
DiBP	N/A	10*	8.3	0.08 - 0.51
DEHP	20	50	34	0.03 - 242.5
DiNP	N/A	150	N/A	N/A
BBP, DBP, DEHP, DiNP (Group Phthalates)	N/A	50	N/A	N/A

EPA=Environmental Protection Agency; EFSA=European Food Safety Authority; ECHA=European Chemicals Agency.

\*EFSA's TDI for DBP assigned to DiBP because of their similar chemical structures.