

## What We Found

### Summary

Our investigation found that BPA is widespread in canned food purchased across the U.S. and Canada. Bisphenol A was detected in 46 of 50 samples tested (or 92%). 43 of 50 samples tested (or 86%) were above the level of quantification. (Laboratory equipment could detect the presence of BPA below 0.5 parts per billion (ppb), but not determine the exact amounts.)

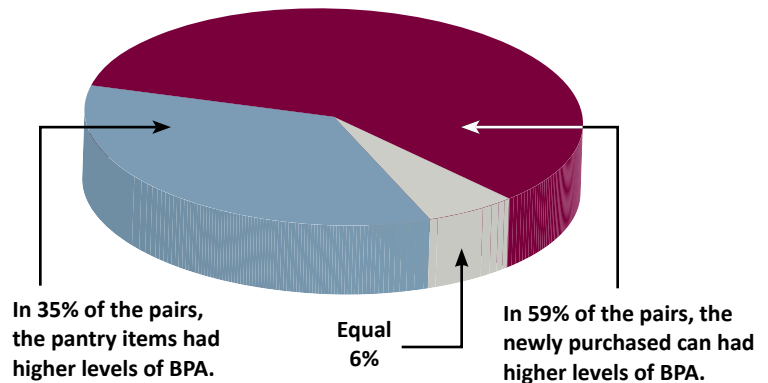
Detected levels of BPA ranged from below 1 ppb, to over a part per million (a thousand times more BPA than the lowest amounts found). To our knowledge, no other study has found such a high level of BPA, with the results in other studies topping out at less than 500 ppb. On average, the products contained 77.36 parts per billion of bisphenol A, with a middle value (median) of 35 parts per billion. A chart of all individual cans is presented in Appendix II.

### BPA in Pantries vs. BPA on Store Shelves

In our investigation, we were interested in exploring whether or not cans in household pantries (where they might sit on the shelf for months or longer) would have higher values than those newly purchased from stores. We found no consistent pattern, as can be seen from the following two examples:

- In some cases where two cans of the same product were tested, widely different levels of BPA were detected. For example, one can of Great Value Sweet Peas from Kentucky,

### No Correlation Found between Age or Canned Food and BPA Levels



which had a 2010 “best-by” date, had 6.5 ppb of BPA, while the identical product newly-purchased from Walmart with a “best-by” date of 2012 had 329.3 ppb—the second highest levels of any food in this study.

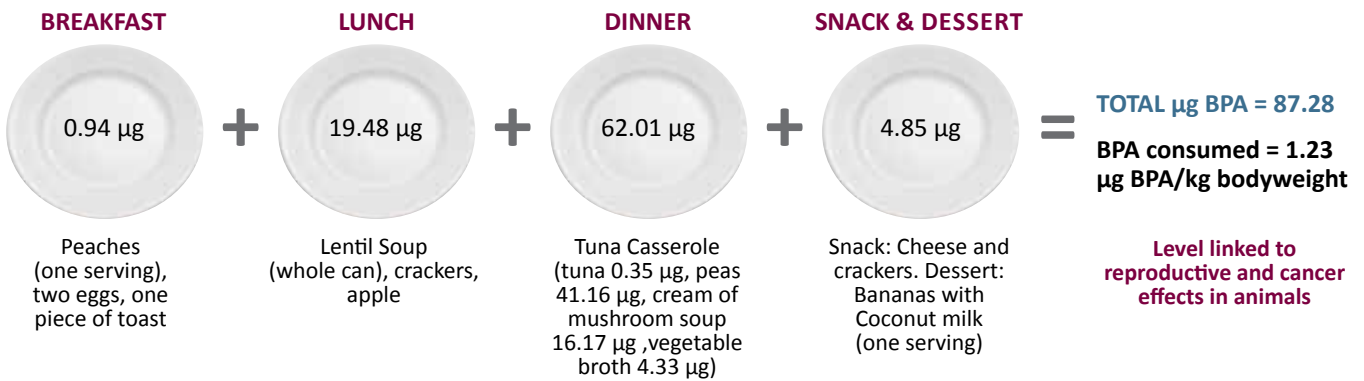
- In a number of cases, one can of a particular product contained roughly twice as much as the other, including Chef Boyardee Beef Ravioli (9.7 ppb from a Kroger’s in Michigan and 21.5 ppb from a Michigan pantry), and College Inn Vegetable Broth (18 ppb from a Connecticut pantry and 40.8 ppb from a Connecticut Stop and Shop).



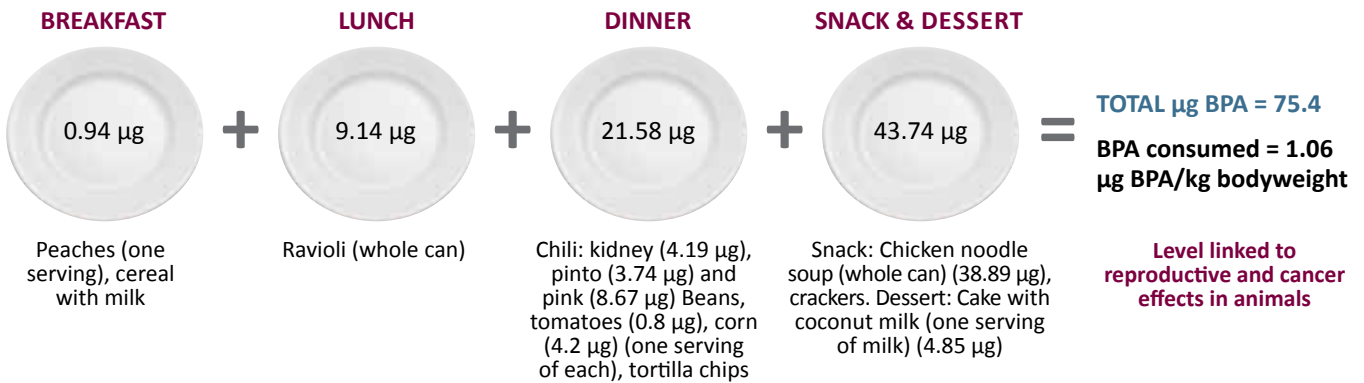
### Daily Estimated Exposure to BPA Reaches Levels Shown to Cause Harm in Laboratory Studies

To better understand how a person’s health might be impacted by consuming a normal diet that includes canned foods, we estimated daily exposure to BPA using different hypothetical menus. The table below shows three days of meals and the BPA exposures that could result based on the data from these product tests. We based our calculations on the weight of an average 20- to 29-year-old woman, according to the CDC<sup>50</sup> (71kg or 156.5 lb), and imagined this woman was in the first trimester of pregnancy since exposure to BPA in the womb is of particular concern. We divided the amount of BPA in micrograms (µg) by her weight (kg) to obtain a weight-adjusted exposure value. **These hypothetical diets show that a pregnant woman may be exposed to potentially harmful levels of BPA that have been shown to alter fetal development in laboratory animals, as evidenced in the table on page 11.**

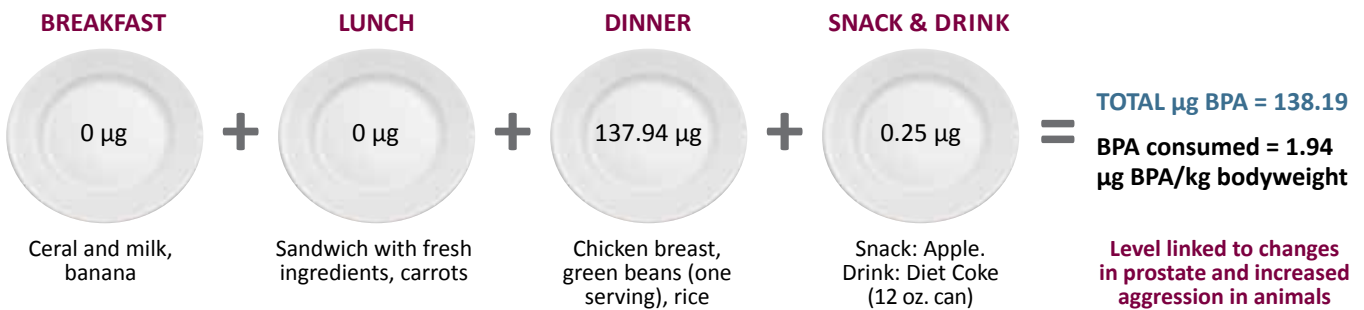
#### DAY 1



#### DAY 2



#### DAY 3



**Case Study: Alma Feldpauch**



Alma Feldpauch participated in a 2009 biomonitoring project in Washington State. Alma was pregnant at the time of the biomonitoring study, and she had tried to avoid the chemicals that she knew, as a scientist, could have harmful

health effects for herself and her baby. She had stopped drinking from plastic bottles, but was not aware of BPA in can linings. “I find it disturbing that some chemicals are not listed in product ingredient lists,” says Alma. She was glad when Washington State passed restrictions on BPA in baby bottles, but thinks the federal government needs to also protect the public from unwanted chemical exposure. “I don’t use plastic baby bottles or canned baby food for my son,” she says. “But chemicals are so ubiquitous, it’s hard to avoid them.”

Thirty-four samples were paired, with either identical items from both store and pantry (28 items or 14 pairs) or similar items (six items or three pairs). As the chart above shows, there was not correlation with the length time an item was stored after purchase and the levels of BPA found in the food, which implies that amount of BPA contamination is a result of manufacturing or production.

Many factors could contribute to this variation, including BPA contamination of the food prior to canning, differences in the amount of BPA in can linings, and differences in can processing or storage temperatures. Given the variability of the results, the information in this report should not be considered representative of a specific brand or kind of food, but rather an indicator of the contamination that is possible in a variety of products. Essentially, this study reveals that it is very difficult to know when a particular can could have higher or lower amounts of BPA, and further highlights the need to find safer solutions to BPA for all canned food.

**Canned Foods With the Highest Levels of BPA**

(above 100 ppb):

- DelMonte French Style Green Beans: 296.2 ppb (store) and 1,140 ppb (pantry)
- Great Value (Walmart’s in-store brand) Sweet Peas: 329.3 ppb (store)
- Healthy Choice Old Fashioned Chicken Noodle Soup: 323.6 ppb (pantry)
- Healthy Choice Old Fashioned Chicken with Rice Soup: 172.4 ppb (store)
- Campbell’s Cream of Mushroom Soup: 130.4 ppb (pantry)
- Campbell’s Chicken Noodle Soup: 120.7 ppb (pantry) and 127.5 ppb (store)

**Canned Foods With the Lowest Levels of BPA**

(below 2 ppb—values below the 0.5 ppb level of quantification are estimates, indicated by an asterisk. ND means BPA was not detected.):






- Coca-Cola—diet, caffeine-free: ND (store) and 0.4 ppb\* (pantry)
- Coca-Cola—diet: ND (pantry) and 0.7 ppb (store)
- Coca-Cola Classic: 0.2 ppb (store) and 0.4 ppb\* (pantry)
- Star-Kist Tuna: 0.7 ppb (pantry) and 1.6 ppb (store)
- DelMonte Yellow Freestone Peaches in Light Syrup: 1.2 ppb (pantry)
- Muir Glen Organic Fire Roasted Crushed Tomatoes: 1.9 ppb (pantry)

DAILY BPA EXPOSURE IN (µg/kg body weight)	HEALTH EFFECTS OBSERVED IN LABORATORY STUDIES <sup>51</sup>
0.0001	Alterations in cell signaling pathways <sup>52</sup>
0.025	Persistent changes to breast tissue, predisposes cells to hormones <sup>53</sup>
0.025	Permanent changes to genital tract <sup>54</sup>
0.2	Decreased antioxidant enzymes <sup>55</sup>
0.25	Altered development of fetal mammary glands <sup>56</sup>
1	Long-term adverse reproductive and carcinogenic effects <sup>57</sup>
2	Increased prostate weight <sup>58</sup>
2	Increased aggression <sup>59</sup>
2.4	Weight gain and early onset of puberty <sup>60</sup>
2.4	Signs of early puberty, increased anogenital distance <sup>61</sup>
2.4	Decline in testicular testosterone <sup>62</sup>
2.5	Predisposes breast cells to cancer <sup>63</sup>

## Alternatives to BPA Can Linings

The good news is that there are a number of ways to preserve food without using bisphenol A. The chart below explores a number of the BPA-free canning methods currently used in the marketplace today. A number of companies are working to develop safer BPA-

free can linings that can be used as a direct replacement for the BPA-based epoxy now in widespread use. This research and development is a direct response to consumer demand for safer products, and the extensive scientific evidence documenting health problems linked to BPA exposure.

Alternatives to BPA Can Linings			
Type of Product	Examples	Description/Benefits	Information needed <sup>64</sup>
<b>Metal Can lining: Polyester Coatings</b> 	Toray Polyester, PET (polyethylene terephthalate) Film	Polyester coatings have been used instead of BPA in can linings since the 1990s, when Japanese can manufacturers voluntarily reformulated their can coating process due to public concern about BPA. One technology uses polyester coatings in place of BPA liners, eliminating BPA from the product. <sup>65</sup> Another uses BPA-based epoxy to glue a PET lining, which reduces BPA leaching by 95%. <sup>66</sup>	Companies are reluctant to disclose use of epoxy adhesives, making evaluating the technology difficult.
<b>Metal Can Lining: Baked-on Resins (oleoresins)</b> 	Eden Foods Canned Beans	Natural oils and resins can be used as an alternative to BPA linings. Oleoresin is a natural mixture of an oil and a resin extracted from various plants, such as pine or balsam fir. <sup>67</sup> This product works for low-acid foods, like beans, not high-acid foods. These linings have only a slightly higher cost than BPA-based linings. <sup>68</sup>	More information about the primer used as a base for these resins is needed.
<b>Glass Jar</b> 	Tomato Sauce	Glass is generally regarded as inert in products like this. Linings of metal lids are lined with BPA-based epoxy at this time. However, less BPA leaches into food.	Manufacturers should reveal the chemicals used for lid linings
<b>Aseptic Packaging (multi-layer boxes)</b> 	Tetra Pak	Aseptic boxes are made of 70 percent paperboard, with thin layers of low density polyethylene (LDPE) and aluminum foil. <sup>69</sup> They are used widely in Europe and are used in the U.S. for juice, soups, tomatoes, liquid dairy products, and wine. Unlike other alternatives here, recycling of these boxes is not widely available. <sup>70</sup>	Manufacturers should fully disclose all materials used for each of the layers.
<b>Polyethylene/ Polypropylene Plastic Jars</b> 	Fruit Cup	Some manufacturers have started packaging fruits in plastic containers that do not use BPA in any part of the product. <sup>71</sup>	Manufacturers should disclose the chemical additives that are mixed with the polyethylene and/or polypropylene.