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Clean Label Project:

WIC-Endocrine Disruptor Study

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Background and Overview:

California's Women, Infants, and Children (WIC) program plays a vital role in supporting the nutritional needs of low-income families across the state. While WIC-approved foods are designed to provide essential nutrients to vulnerable populations, little is known about their potential contamination with endocrine disrupting chemicals (EDCs)—substances that can interfere with hormonal systems and pose serious health risks, particularly during critical stages of development.

Emerging research links EDC exposure to a range of adverse health outcomes, including developmental, reproductive, neurological, and immune effects. These risks are especially concerning for pregnant women, infants, and young children, who are more susceptible to the effects of these chemicals. Communities served by WIC are already disproportionately burdened by environmental health disparities, and the presence of harmful chemicals in everyday food items could further compound these inequities.

Clean Label Project engaged in this process in part through funding by the Rose Foundation for Communities and the Environment to address a critical gap in food safety by evaluating California WIC-approved products for the presence of high levels of EDCs. By identifying high levels of harmful substances in products frequently consumed by low-income families, we aim to inform and empower affected communities, health professionals, and policymakers. Our goal is not only to raise awareness, but also to drive systemic change—ensuring safer food access for all families, particularly those historically underserved.

Through transparent research, multilingual public engagement, and actionable recommendations, this initiative strives to improve the health and well-being of women, infants, and children across California by reducing harmful exposures and advocating for safer, more equitable food systems.

Executive Summary:

This project aimed to assess the presence of endocrine disrupting chemicals in California WIC-approved food products. These foods are a cornerstone of nutrition support for low-income families across the state, and ensuring their safety is essential for protecting vulnerable populations—particularly pregnant women, infants, and young children—from harmful chemical exposures.

Clean Label Project analyzed a wide range of WIC-approved products, including fresh, frozen, canned fruits and vegetables, and other commonly consumed items. All samples were tested by an ISO-accredited analytical chemistry laboratory for the presence of phthalates, a class of EDCs known to interfere with hormonal development and function. Canned products were additionally tested for bisphenol A (BPA), a chemical widely used in can linings and associated with similar health concerns.

All tested products were found to be compliant with California Proposition 65 regulatory standards for phthalates and BPA, meeting the state's pass/fail criteria. Our analysis, however, revealed several noteworthy trends and areas of concern that warrant further attention.

Key takeaways from the findings include:

- **Phthalate Contamination was Found in Common WIC-Approved Foods but Only One Exceeded Established CA Prop 65 Limits in One Serving**

  Several products—particularly canned and plastic-packaged items—contained detectable levels of phthalates, including DEHP and DINP. These chemicals are known endocrine disruptors and raise concern, especially in foods commonly consumed by women, infants, and children.

- **Some Products Could Exceed California Prop 65 Exposure Thresholds**

  A small number of products—based on typical serving sizes—could exceed California's No Significant Risk Level (NSRL) for chemicals like DINP and DEHP. For example, less than one full serving of some canned or bulk items could lead to exposure above the state's safety threshold.

- **Food Packaging Plays a Key Role in Chemical Contamination**

  Patterns emerged linking packaging type to contamination risk. Items packaged in plastic bags, cans, and jars were more likely to contain detectable levels of phthalates or BPA, highlighting the importance of considering not just what's in the food, but how it's stored and sold.

- **Easy & affordable Alternatives.**

  Protecting your family doesn't have to be hard—or expensive. From food packaging to storage containers, a simple sweep of your kitchen cabinets can uncover easy swaps that help reduce exposure to harmful chemicals.

The ultimate goal of this initiative is to raise awareness of harmful chemical exposures in everyday foods and advocate for improved access to safe, nutritious, and affordable options for all California families—especially those served by the WIC program.

What are Phthalates?

Phthalates are a group of chemicals that are used to make plastics more flexible and durable. Sometimes called “plasticizers,” they are used in many products, including cosmetics, fragrances, vinyl flooring, and shower curtains. Phthalates are also used in some equipment that comes into contact with food during manufacturing such as lubricants or sealants, and as a component of food packaging to ensure consistent product quality. Exposure to phthalates occurs via eating or drinking foods that have come into contact with packaging made with phthalates, in addition to contact with other household products.

The State of California has set limits for many potentially harmful chemicals including Phthalates, and Federal law prohibits adding phthalates directly to food. Studies have shown that phthalates might be harmful to human health at certain levels with links to infertility, asthma, and certain cancers. Phthalates can also interfere with the function of hormones, the body’s chemical messengers. Further, studies have linked elevated phthalate intake to pregnant women delivering babies early, lower IQ, ADHD, and other developmental and behavioral issues.

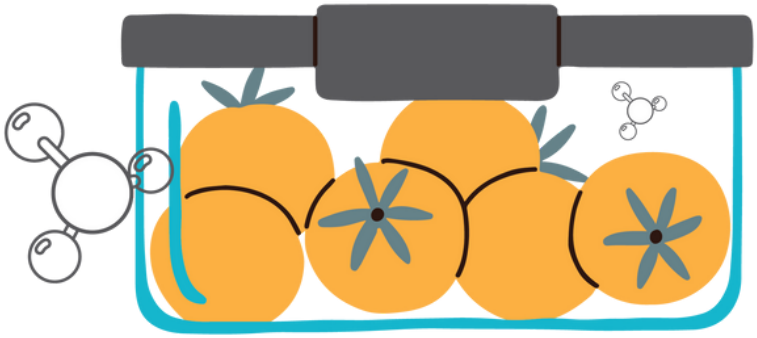
What is BPA?

BPA (bisphenol A) is a chemical used in making certain plastics and resins. It's often found in products like baby bottles, water bottles, food containers, and even the lining of some cans. BPA can sometimes seep out of these products and into food or water, especially when they're heated. Studies suggest that BPA might have harmful effects on health, including as an Endocrine Disruptor. Recently some products have started to be labeled "BPA-free," however, a lot of food containers and food packaging still contain BPAs, so it’s important to know which food products might result in exposure.

What is an Endocrine Disruptor?

Hormones are partially responsible for internal regulation of the human body. They act as messengers, allowing different parts of the body to communicate information about growth and other body functions. “Endocrine disruptor” is a term used to label small molecules that mimic or disrupt the functions of hormones in our body. They mimic hormones by having almost an identical chemical structure - like having two keys that are different colors but they both can unlock the same lock. Sometimes these chemicals distort or change messages from one part of the body to another, resulting in abnormal growth patterns across the lifespan including pregnancy.

How do phthalates and BPA get into our food and our bodies?



Food stored in BPA-containing packaging can release these chemicals into the food, especially when exposed to high temperatures or frequent movement. When that food is consumed, the phthalates and BPA come with it. After digestion, BPA components can be absorbed into the bloodstream, traveling to many parts of the body including the reproductive system. Here, Phthalates can become Endocrine Disruptors mimicking or disrupting processes in the reproductive system and potentially resulting in the harmful effects described previously.

Effects of Phthalates on Young Children and Pregnant Women:

Phthalates that enter the body can cause problems for women like a delayed period, increased appetite, and acne breakouts. It can also complicate becoming pregnant, and increase the likelihood of miscarriage, early births, or late births with complications. Phthalates can be passed from mom to baby during pregnancy and children are particularly vulnerable to the effects of phthalate exposure as their bodies are still developing. In boys, these chemicals can interfere with the development of reproductive organs, leading to problems like malformed genitals, low sperm count, and even cancer. For girls, it can cause periods to start early and limit the number of eggs they develop leading to infertility. In all young children these chemicals can make puberty start too early or too late.

Regulations of Phthalates and BPA in our Food Packaging:

There are currently minimal federal regulations in the US that limit or monitor the amount of phthalates or BPA in food products. Proposition 65, a California regulation that addresses chemicals known to be harmful to the reproductive system or cause cancer, requires businesses with a product containing these chemicals of concern to display a public warning on their packaging about the chemicals. Prop 65 applies to food packaging, but California does not have any laws or regulations that limit or monitor phthalates or BPA in actual food products. Enforcement rates are also low and penalties for failing to comply often only amount to fines.

What is WIC?

The Special Supplemental Nutrition Program for Women, Infants, and Children, or WIC, is intended to promote the health of low-income pregnant, postpartum, and breastfeeding women, infants, and children up to age 5. WIC provides medical care, education, vouchers for supplemental food and formula, and other services to participants. WIC foods include milk, cheese, eggs, fruits, vegetables, purees and infant formula if necessary. The program also provides information on healthy eating, breastfeeding promotion and support, and referrals to health care.

The California WIC Consumer-White paper

In fiscal year 2023-24, the California WIC program served nearly 1 million participants, including pregnant, breastfeeding, and non-breastfeeding mothers, infants, and children. In California, approximately 54% of infants born each year participate in WIC. The program operates with a budget of $650 million in federal food funds, $217 million in manufacturer rebates, and $306 million in nutrition services funds.

Here's a more detailed breakdown of WIC stats in California:

Participation Numbers:

Total Participants: Nearly 1 million participants in FY 2023-24

Pregnant Women: 78,828

Breastfeeding Women: 87,727

Infants: 176,938

Children: 603,088

California WIC has nearly **4,000 authorized vendors/grocers** where WIC participants can use their WIC Card

More than 40% of WIC recipients identify as Hispanic and a significant share identify as Black or multiracial. These communities are already disproportionately affected by environmental health risks, making the safety of WIC-approved foods not just a nutritional concern, but a matter of environmental justice and health equity.

Methods of Sampling, Preparation, and Testing:

To assess the presence of EDCs in California WIC-approved food products, a total of 71 samples were purchased from retail locations in the San Francisco and San Diego areas in 2024 and 2025. Products selected included fresh, frozen, and canned fruits and vegetables, as well as a limited number of other WIC-eligible food items. The selection aimed to simulate a typical consumer shopping experience and explore differences in potential contamination by product type and packaging material.

All testing was conducted by Anresco Laboratories, an independent analytical testing laboratory accredited under ISO/IEC 17025:2017 by ANAB (Certificate Number AT-1551). Testing procedures followed validated, industry-standard methods to ensure reliable and reproducible results.

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Phthalates Testing

Analysis: Phthalates
Target Compounds:

- Benzyl butyl phthalate (BBP)
- Dibutyl phthalate (DBP)
- Di(2-ethylhexyl) phthalate (DEHP)
- Di–isodecyl phthalate (DIDP)
- Diisononyl phthalate (DINP)
- Di-n-octyl phthalate (DNOP)

Instrument: Liquid Chromatography with Tandem Mass Spectrometry (LC-MS/MS)
Analytical Method: *Agilent Application Note 5990-9510EN*
Level of Detection/Level of Quantification (LOD/LOQ): 0.02/0.1 ppm

This method allows for the highly sensitive and specific detection of phthalates in complex food matrices. Phthalates were quantified in each sample and reported in parts per million (ppm).

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Bisphenol A (BPA) Testing

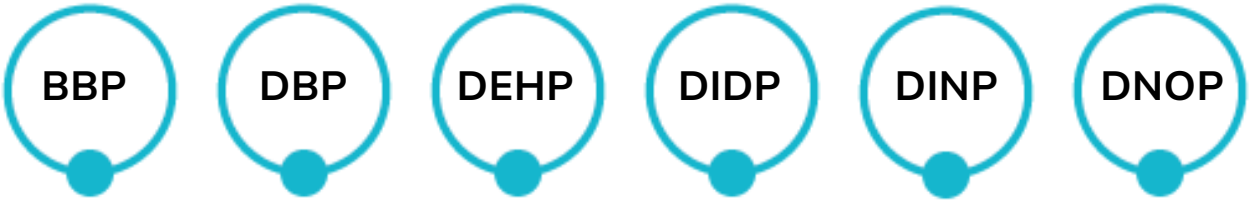
Analysis: Bisphenol A (BPA)
Instrument: Liquid Chromatography with Tandem Mass Spectrometry (LC-MS/MS)
Analytical Method: *QuEChERS (Quick, Easy, Cheap, Effective, Rugged, and Safe)* sample preparation protocol, as performed by Anresco Laboratories
Level of Detection/Level of Quantification (LOD/LOQ):0.010/0.050 ppm

This method is optimized for detecting trace levels of BPA in food samples and is especially effective in processed or packaged goods. Results were also reported in ppm.

Findings:

Chemical Tested

All 71 products were tested for the presence of phthalates, a group of chemicals used in plastics and known to interfere with hormone function. These included:



An additional 11 samples (primarily canned items) were tested for bisphenol A (BPA), a chemical often found in can linings and plastic containers.

California Legal and Safety Thresholds

While federal and state laws do not currently regulate these chemicals in food, California does restrict their use in children's toys and childcare products. Additionally, Proposition 65 establishes "safe harbor" exposure levels, which are used to determine when consumer warnings are required:

- **NSRL (No Significant Risk Level)** – For cancer-causing chemicals
- **MADL (Maximum Allowable Dose Level)** – For reproductive toxicants

Chemical	NSRL (µg/day)	MADL (µg/day)
DEHP	310	410 (oral - adult)
DIDP	—	2,200
DINP	146	—
BPA	—	3 (dermal), 58 (oral - infant)

Overview of Contaminant Detection

Of the 71 samples tested:

Chemical	# of Products with Quantifiable Levels
BBP	0
DBP	0
DEHP	3
DIDP	1
DINP	20
DNOP	0
BPA (of 11 samples)	3

Notable Findings

- DINP was the most frequently detected contaminant, appearing in 20 products
  - One product—a canned whole potato—contained DINP at 1.17 ppm. Consuming less than one serving (124.8g vs. a 156g serving size) would exceed the NSRL for cancer risk.
  - Four additional products would exceed the NSRL within three servings or less:
    - Bulk organic artichokes
    - Bulk corn
    - Canned diced tomatoes
    - Canned garbanzo beans
- BPA was found in 3 of 11 products tested, with levels ranging from 0.01 ppm to 0.02 ppm. These were all canned products. Upon retest, these products were non-detect for BPA.

Bulk Packaging and Storage Insights

Ten fresh produce items were purchased in bulk and stored in plastic produce bags for 24 hours. The products were transported in an ambient temperature car for approximately 15 minutes before refrigeration. These included green beans, sugar snap peas, and artichokes. Several of these showed measurable DINP levels. While these plastic bags are typically made of polyethylene, there is the potential that short-term storage in plastic packaging may contribute to contamination. Another source of the fresh produce contamination could be the waxes used on fresh produce.

Contaminants by Packaging Type

Packaging Type	DEHP	DIDP	DINP	BPA
Plastic bottle	—	1	1	—
Box	1	—	1	—
Jar	—	—	3	—
Plastic bag	2	—	7	—
Can	—	—	7	3
Plastic tub	—	—	1	—

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Study Limitations:

While this study offers valuable insights into the presence of endocrine-disrupting chemicals (EDCs)—particularly phthalates and BPA—in WIC-approved food products, several limitations should be considered when interpreting the results:

1. Single Sample per Product

Only one sample per product was selected and tested, rather than multiple samples across different lots or purchase times. As a result, the findings may not fully represent batch-to-batch variability or differences across manufacturing dates. Broader sampling would be needed to draw more generalizable conclusions about specific brands or product types.

2. Unknown Source of Contamination

While phthalates and BPA were detected in the finished food products, this study did not assess where contamination occurred within the supply chain. Contaminants may have entered during:

- Farming or harvesting
- Processing or packaging
- Storage or transportation

As such, the findings cannot identify the precise point of chemical introduction or determine which part of the process poses the greatest risk.

3. Limited Chemical Scope

The study focused on a defined list of phthalates and BPA, but did not test for:

- Other types of bisphenols (e.g., BPS, BPF) that may be used as BPA substitutes
- Other classes of endocrine disruptors or food contact chemicals

Future testing could expand chemical coverage to offer a more comprehensive view of potential exposures.

4. No Assessment of Dietary Exposure or Health Risk

This study measured chemical presence, not actual human exposure or health outcomes. While comparisons were made to California Prop 65 thresholds (e.g., NSRLs and MADLs), those values are regulatory benchmarks—not direct measures of personal health risk. Further research would be needed to assess:

- Frequency of consumption
- Portion sizes
- Cumulative exposure from multiple sources

5. Focus on a Limited Geographic Area

All products were purchased in retail stores located in the San Francisco and San Diego areas. While this was intended to simulate a real consumer experience in two large California regions, it may not reflect the full diversity of shopping habits or product availability across the entire state.

Despite these limitations, the study highlights important potential exposure concerns and underscores the need for continued investigation into the sources and health implications of chemical contaminants in foods consumed by vulnerable populations, including women, infants, and children.

Conclusion:

As regulatory agencies, researchers, and the public continue to prioritize the safety of our food supply, much of the current focus has appropriately centered on heavy metal contamination in food products. This is a critical issue, particularly for vulnerable populations like women, infants, and children, who are most at risk of the long-term health effects associated with toxic exposure.

This study underscores the need to broaden the narrative beyond the ingredients themselves and consider the role of food packaging and processing materials in contributing to chemical contamination. Our findings show that phthalates and BPA—endocrine-disrupting chemicals linked to developmental, reproductive, and metabolic health concerns—can be present in the finished food products purchased by families using the California WIC program. In many cases, these contaminants likely originate not from the food source but from upstream components of the supply chain, including processing equipment, packaging materials, and storage conditions.

While most tested products complied with current California Prop 65 pass/fail thresholds, the presence of these chemicals—especially in foods consumed regularly by disadvantaged communities—highlights a broader exposure concern. **Food contact materials like plastic containers, cans, wraps, and bags can leach harmful substances into the foods they're intended to protect, often without being subject to the same level of scrutiny as the food itself.**

As we look to strengthen food safety regulations and promote environmental justice, it is imperative that food packaging and contact materials receive more attention as potential vectors of chemical exposure. This includes not only identifying high-risk materials, but also investing in safer alternatives, improving transparency in labeling, and promoting best practices across the food system—from farm to shelf.

Ultimately, protecting public health—especially the health of our most vulnerable populations—requires a holistic approach that considers both what's in our food and what it's touched by on its way to the plate. Broadening our focus in this way is essential for reducing harmful exposures, empowering informed consumer choices, and advancing true food safety and equity.

What Can You Do? How to Minimize Exposure to Phthalates and BPA at Home:

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While it's not always possible to completely avoid endocrine disrupting chemicals like phthalates and BPA, there are practical steps families can take to reduce everyday exposure—especially for pregnant women, infants, and young children who are more vulnerable to their effects.

Choose Fresh or Frozen Over Canned:
Whenever possible, buy fresh or frozen fruits and vegetables instead of canned, as BPA is commonly found in can linings. If using canned goods, look for "BPA-free" labels, but note that substitute chemicals may not be fully tested.

Limit Plastic Use in Food Storage:
Avoid storing food in soft or flexible plastic containers, especially those labeled with recycling codes 3 (phthalates), 6 (styrene), or 7 (may contain BPA). Instead, use glass, stainless steel, or BPA-free hard plastic containers for storing food and drinks.

Don't Microwave in Plastic: Heat can cause chemicals in plastic to leach into food. Always transfer food to a glass or ceramic container before microwaving.

Be Cautious with Plastic Wraps and Bags:
Minimize the use of plastic produce bags or wraps, particularly for warm or high-fat foods (which can increase leaching). Wash produce before eating, especially if it's been stored in plastic packaging.

Avoid Plastic Baby Bottles and Sippy Cups with BPA:
Use baby bottles and toddler cups that are clearly labeled BPA-free or made from alternatives like silicone or glass.

Ventilate and Dust Regularly:
Phthalates can accumulate in household dust. Regular cleaning and ventilation can help lower your family's exposure.

Even small changes can add up over time. Making informed choices about packaging, storage, and product labels is a powerful step toward creating a healthier home environment.

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