

What to Know about Genetically Modified Organisms (GMOs)

GMOs are genetically altered to display preferred traits for consumers or producers



Some plants are genetically modified to be resistant to weed killers, or herbicides



Chemicals found in herbicides can pose a health risk, especially to children



As a result, more chemicals are being passed on to consumers!

Since these crops are not killed by herbicides, farmers can apply even more chemicals to their fields to control weeds

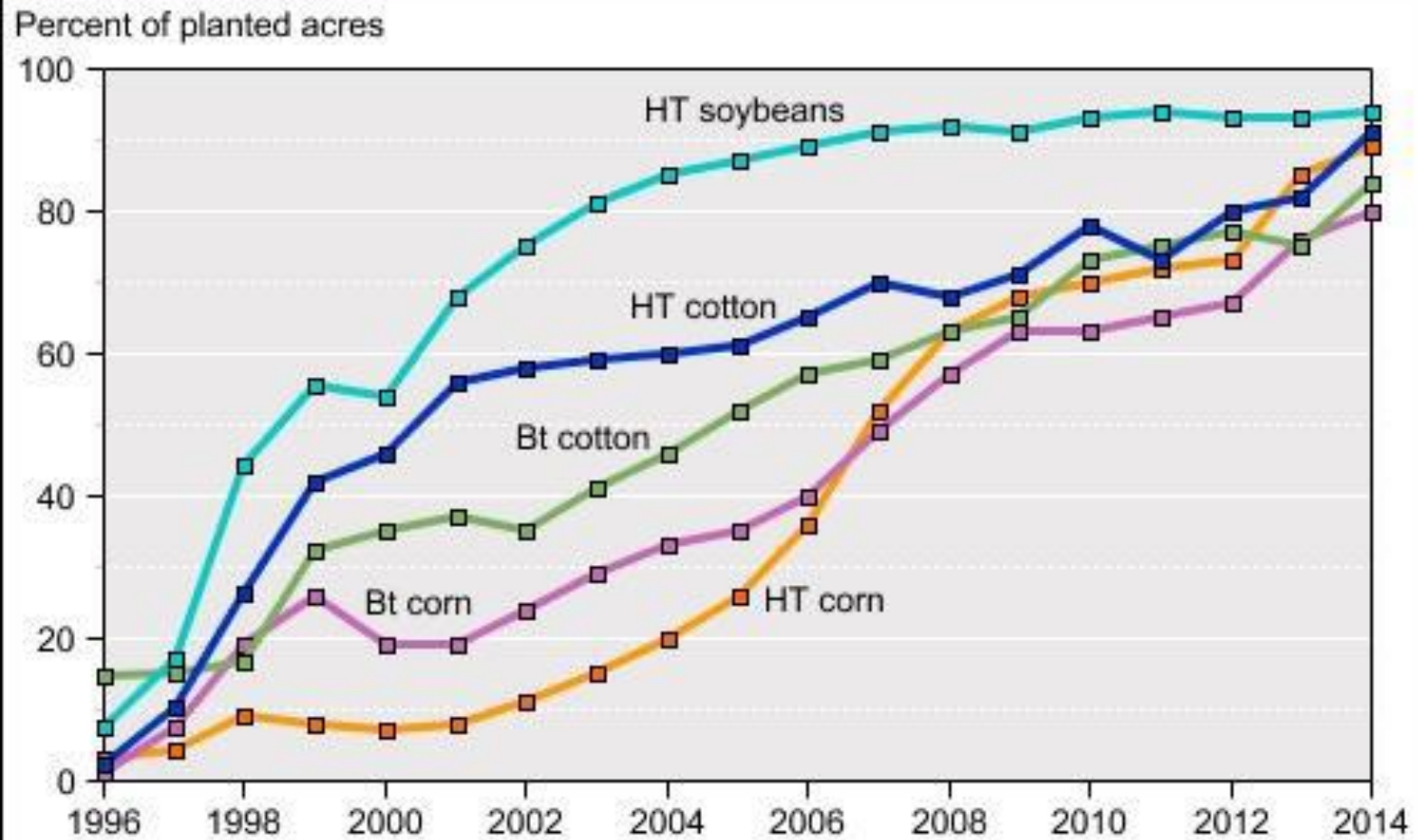


Glyphosate-based weedkillers

- ▶ Detected on 90% of GM soy samples
- ▶ Detected in 27/109 samples of packaged bread
- ▶ Detected in oats and oat products
- ▶ Probable carcinogen (IARC, Class 2B)
- ▶ Studies find evidence of:
 - Hormone disruption
 - Neurotoxicity
 - Antibiotic resistance
 - Birth defects



Adoption of genetically engineered crops in the United States, 1996-2014



Data for each crop category include varieties with both HT and Bt (stacked) traits.
Sources: USDA, Economic Research Service using data from Fernandez-Cornejo and McBride (2002) for the years 1996-99 and USDA, National Agricultural Statistics Service, June Agricultural Survey for the years 2000-14.

~90% of corn and soy grown in the U.S. is genetically modified

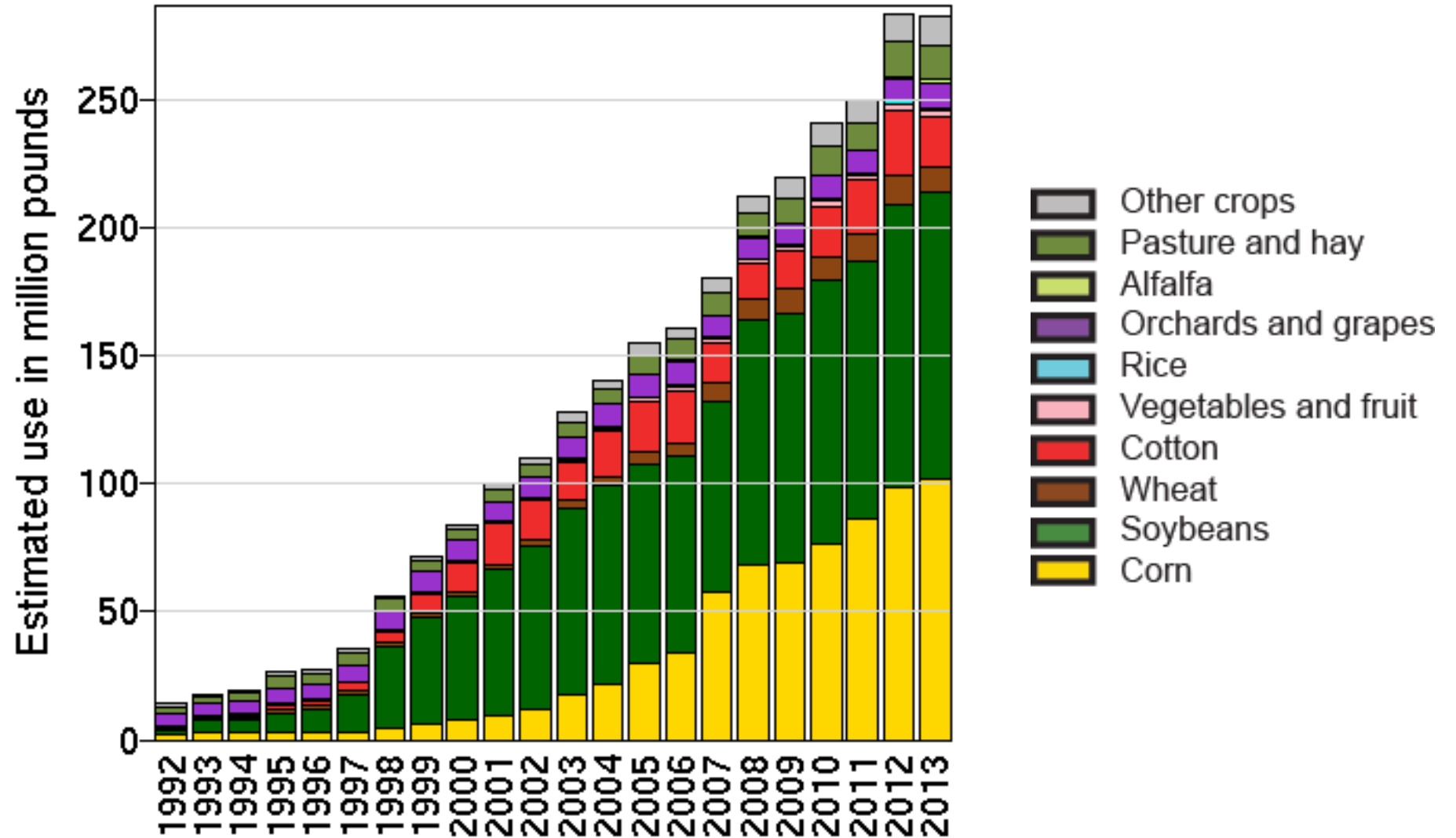
USDA: Genetically Engineered Crops in the United States

Economic Research Service Economic Research Report Number 162 February 2014

The Pesticide Treadmill

Glyphosate
Use 1992-
2013

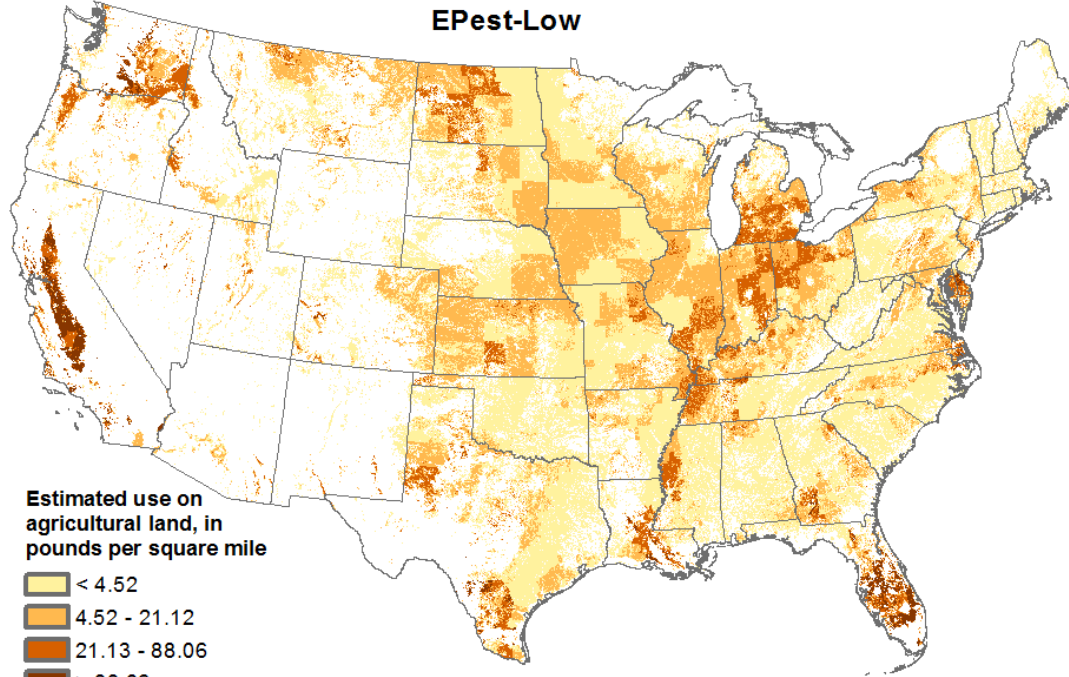
Use by Year and Crop



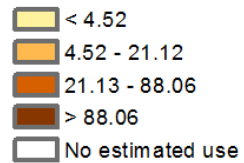
Glyphosate usage in the U.S.

Estimated Agricultural Use for Glyphosate , 1992

EPEst-Low

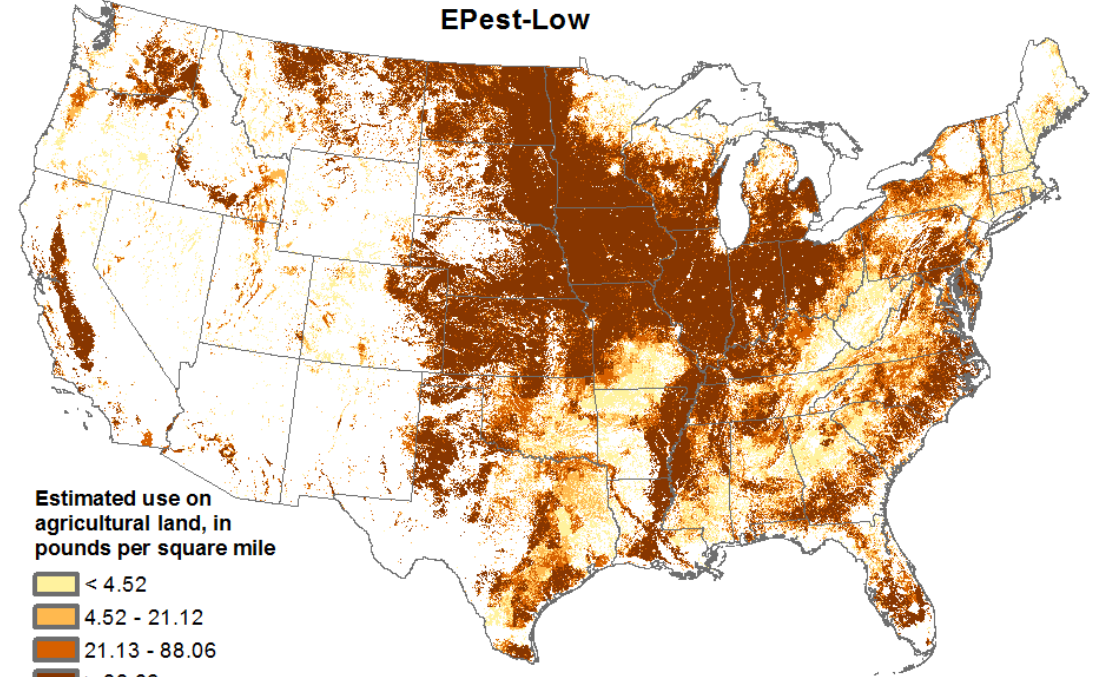


Estimated use on agricultural land, in pounds per square mile

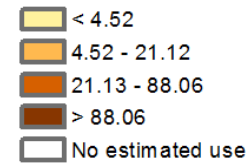


Estimated Agricultural Use for Glyphosate , 2013 (Preliminary)

EPEst-Low



Estimated use on agricultural land, in pounds per square mile



Simple Steps to Avoid Genetically Modified Organisms (GMOs)

Check Labels

GMOs are not required to be labeled. Instead, look for these non-GMO labels:



Did you know that 90% of corn and soy planted in the U.S. are GMOs? Avoid foods that are most likely to be genetically modified.

Shop at Farmers Markets



Ask your local producers if they use genetically modified seeds.

Grow Your Own Produce



Start growing at home or join a community garden.



Pediatric Environmental Health Specialty Unit
Region 2: NJ | NY | PR | USVI



New York State
**Centers of Excellence in
Children's Environmental Health**
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Food Packaging: Endocrine Disrupting Chemicals

- ▶ Substances that change the way hormones act in your body
- ▶ Present in many every day products
- ▶ Linked to reproductive defects, cognitive and behavioral problems, cancer, obesity, and metabolic defects



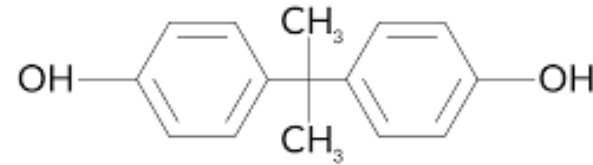


Nikon

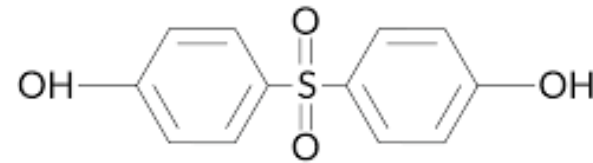
Bisphenol A and Bisphenol S

- ▶ Act like Estrogen
- ▶ May affect the thyroid
- ▶ Associated with:
 - Altered child behavior
 - Hyperactivity and impaired learning
 - Conduct disorder
 - Early puberty
 - Increased body weight
 - Cardiovascular disease and diabetes

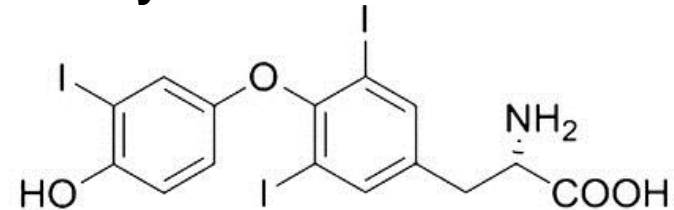
Bisphenol A



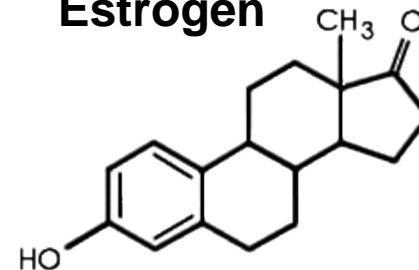
Bisphenol S



Thyroid hormone

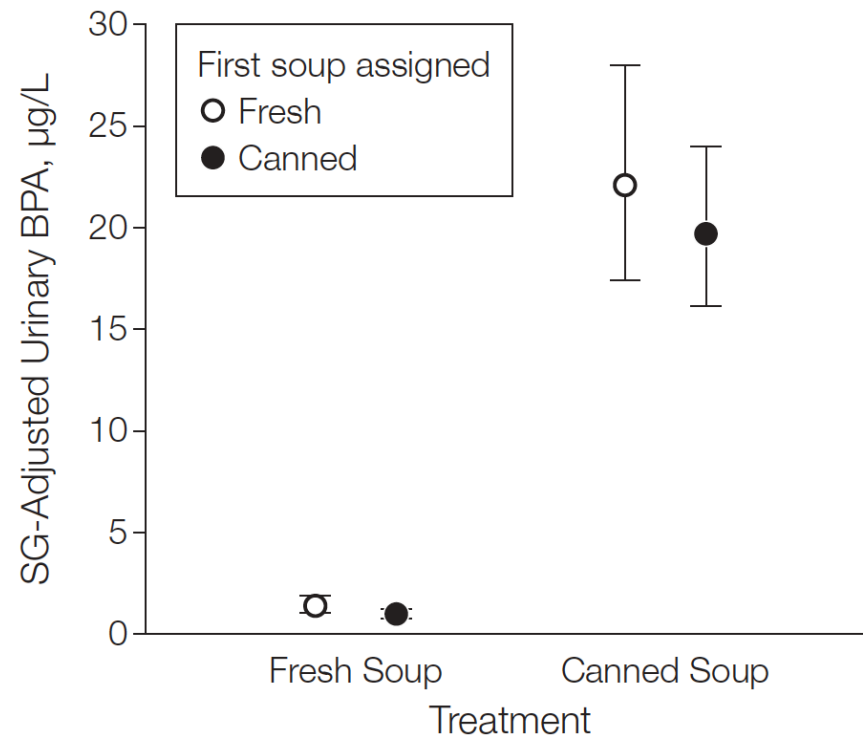


Estrogen



Bisphenol A exposure through canned soup

Figure. Geometric Mean Specific Gravity–Adjusted Urinary Bisphenol A Concentration After a Week of Soup Consumption by Treatment Sequence



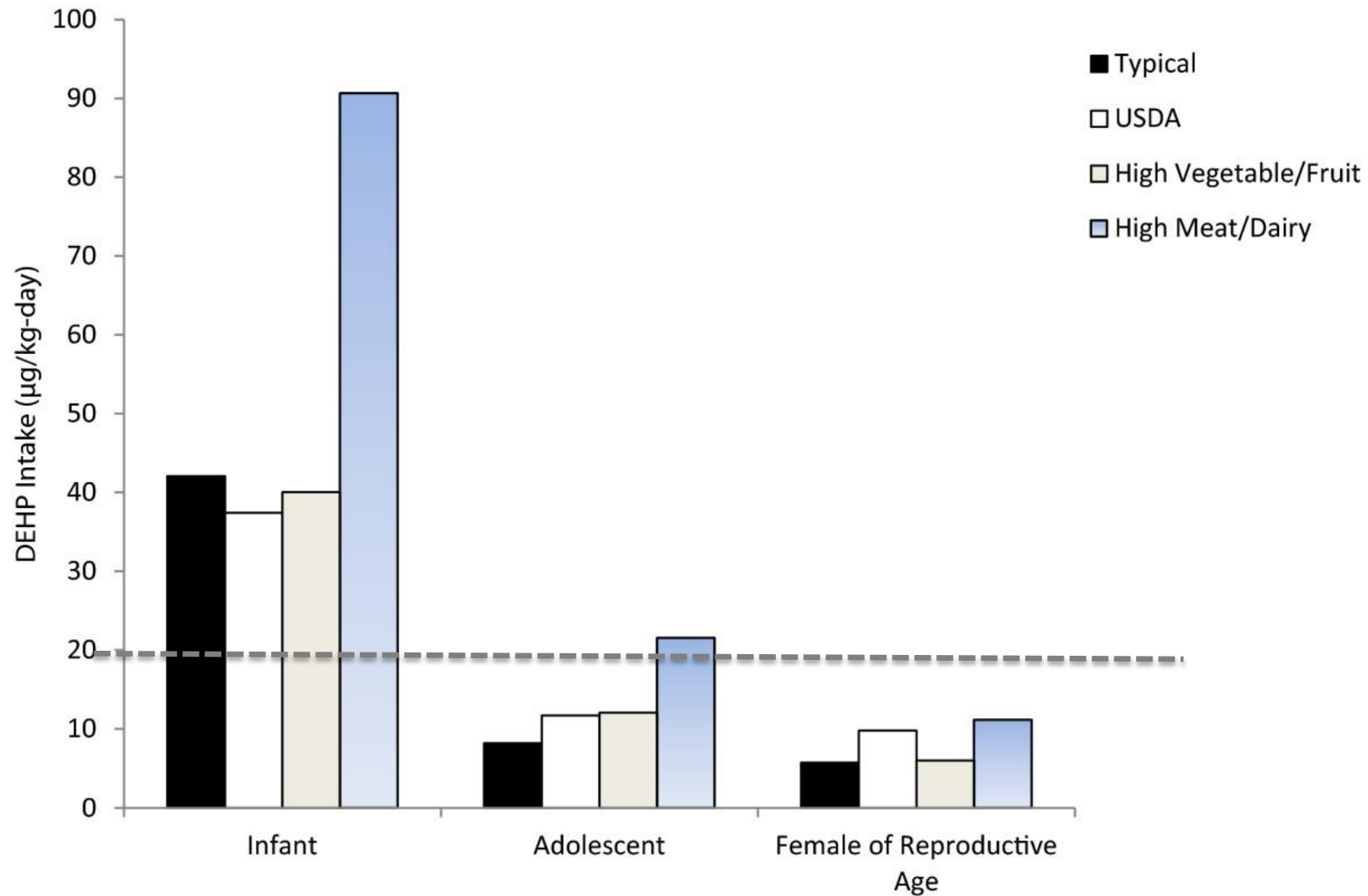
Phthalates

- ▶ Anti-androgenic (testosterone)
- ▶ Act like estrogen
- ▶ Interferes with thyroid hormone
- ▶ Inflammatory

- ▶ Health effects:
 - Reproductive defects
 - Increased breast cancer risk
 - Obesity
 - Asthma, allergy, eczema
 - Cognitive and behavioral deficits



Dietary phthalate exposure in children from high fat meats and dairy



EPA RFD:
20 $\mu\text{g}/\text{kg}$ day)

Unexpected results in a randomized dietary trial to reduce phthalate and bisphenol A exposures

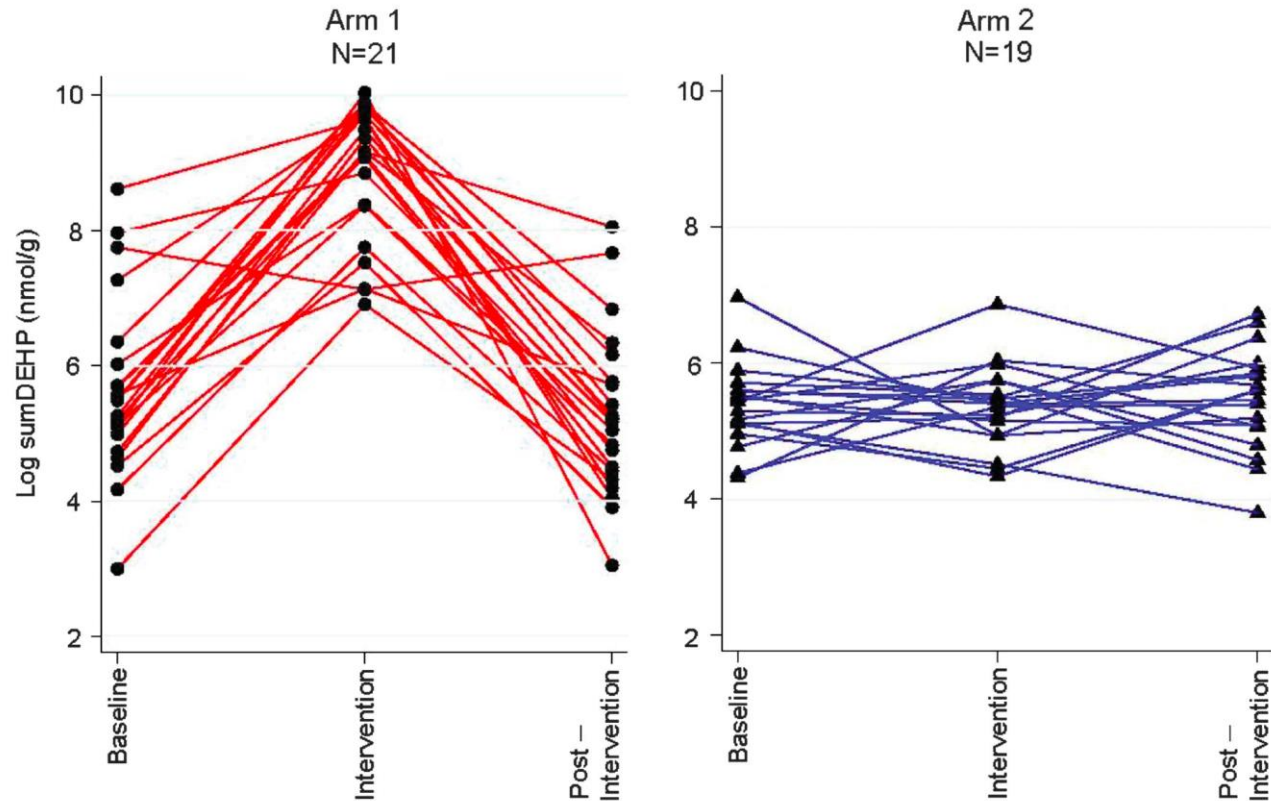


Table 4. DEHP concentrations in foods used in Arm 1 dietary intervention.

Category	Food	DEHP concentration (ng/g)
Dairy	Butter	595
	Heavy cream	488
	Milk	673
	Cheese	396
Meats	Egg yolk	39
	Beef	12
	Chicken	18
	Pork	25
	Lamb	49
Peanut butter	Peanut butter	164
Cane sugar	Cane sugar	<34
Honey	Honey	<28
Oats	Oats	32
Spices	Salt/pepper	<26
	Cayenne pepper	707
	Star anise	<210
	Ground coriander	21 400
	Cumin	<181
	Ground cinnamon	958
	Canola oil	<28

Microwaving and storing food in plastic wrap or containers



Plastic numbers 3,6 and 7



Floor Tiles and School Supplies with PVC/Vinyl

Buying/drinking bottled water



AVOID



Excessive handling of thermal receipts with BPA

Reusing disposable plastic beverage bottles



Canned foods or baby formula



#3 Vinyl (PVC) Plastic Wrap

Tap water



Plastics labeled “BPA FREE” – which is now the law for baby bottles and sippy cups



Glass, Pyrex or porcelain to microwave and paper towels to prevent splatter

Glass containers or stainless steel reusable water bottles



CHOOSE



Fresh or frozen produce; breast feed or use powdered infant formula

Wax paper bags and parchment paper or cloth



Electronic receipts (via email, text)



PVC/Vinyl-Free Flooring and School Supplies

A Consumer's Guide to Food Shopping



Top 7 Tips for Food Shopping Smart



- ✓ Don't trust terms like "natural" or misleading "healthy" images; always read the ingredients list carefully
- ✓ Purchase USDA certified organic or Non-GMO Project Verified products when possible to avoid exposure to pesticides
- ✓ Shop the "clean fifteen"; avoid the "dirty dozen" (<http://www.ewg.org/foodnews/index.php>)
- ✓ Shop farmer's markets or join a Community Supported Agriculture program (CSA) where you can meet the farmer and ask about pest control and agricultural practices
- ✓ Choose meat and dairy products raised without antibiotics and synthetic hormones
- ✓ Choose fresh, whole foods; avoid packaged foods with artificial flavor, color, and preservatives
- ✓ Choose fresh or frozen; avoid canned foods that may be lined with chemicals that interfere with hormones

Simple Steps

- ▶ Avoid the Dirty Dozen and embrace the Clean Fifteen
- ▶ Avoid #3,6, and 7 plastics (*5,4,1,2 all the rest are bad for you!*)
- ▶ Use fewer products
- ▶ Read labels; avoid “greenwashing”
- ▶ Avoid aerosolized sprays and loose powders
- ▶ Ventilate
- ▶ Wash hands with plain soap and water
- ▶ Leave your shoes at the door
- ▶ Reduce dust: wet mop, HEPA vacuum
- ▶ Make your own cleaners with baking soda, vinegar, and lemon juice



Simple Steps, Broad Impact

- **Support companies** that are reducing the use of toxic chemicals and untested ingredients
- Support companies that **disclose all ingredients**
- Support **research** on the effects of common chemicals – science is needed to inform policy.
- Support legislation that protects children from harmful environmental exposures.
- Utilize your social networks to **educate others!**

The Good News

- ▶ Parents are the best advocates!
- ▶ Consumer pressure works (BPA, Mars candy, Kraft, General Mills, J&J, P&G, Walmart, Target)
- ▶ Accelerating research and emerging green chemistry
- ▶ Many chemicals of concern are not persistent
- ▶ Benefits of good nutrition, exercise, nature, and positive social environment





Thank You!

