

**(KEEP A  
BREAST)**

**&**



**ENVIRONMENTAL  
WORKING GROUP**

# ***DIRTY DOZEN***

***LIST OF ENDOCRINE  
DISRUPTORS***

12 HORMONE-ALTERING  
CHEMICALS AND HOW TO  
AVOID THEM

[keep-a-breast.org](http://keep-a-breast.org)

[ewg.org](http://ewg.org)

## *THE DIRTY DOZEN*

- 2 BPA**
- 6 DIOXIN**
- 8 ATRAZINE**
- 10 PHTHALATES**
- 12 PERCHLORATE**
- 14 FIRE RETARDANTS**
- 16 LEAD**
- 18 ARSENIC**
- 20 MERCURY**
- 22 PERFLUORINATED  
CHEMICALS**
- 24 ORGANOPHOSPHATE  
PESTICIDES**
- 26 GLYCOL ETHERS**

# ***DIRTY DOZEN***

## ***LIST OF ENDOCRINE DISRUPTORS: 12 HORMONE-ALTERING CHEMICALS AND HOW TO AVOID THEM***

There is no end to the tricks that endocrine disruptors can play on our bodies: increasing production of certain hormones; decreasing production of others; imitating hormones; turning one hormone into another; interfering with hormone signaling; telling cells to die prematurely; competing with essential nutrients; binding to essential hormones; accumulating in organs that produce hormones.

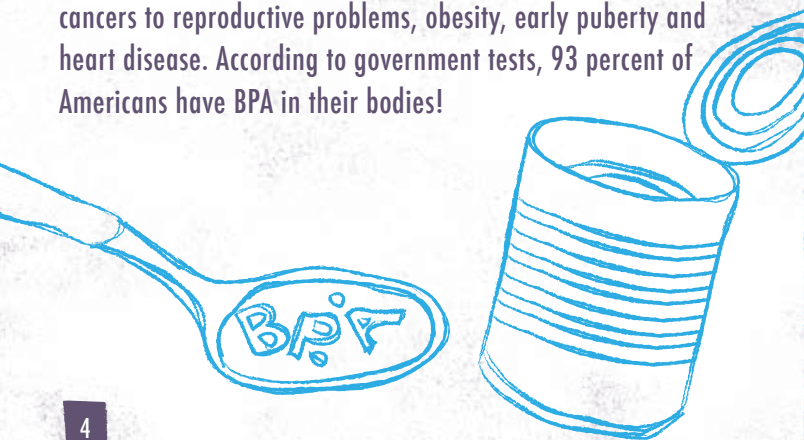
Here are 12 of the worst hormone disruptors, how they do their dirty deeds, and some tips on how to avoid them.

# BPA

*SOME MAY SAY THAT IMITATION IS THE SINCEREST FORM OF FLATTERY, BUT DO YOU REALLY WANT A CHEMICAL USED IN PLASTICS IMITATING THE SEX HORMONE ESTROGEN IN YOUR BODY?*

**NO!**

Unfortunately, this synthetic hormone can trick the body into thinking it's the real thing – and the results aren't pretty. BPA has been linked to everything from breast and other cancers to reproductive problems, obesity, early puberty and heart disease. According to government tests, 93 percent of Americans have BPA in their bodies!

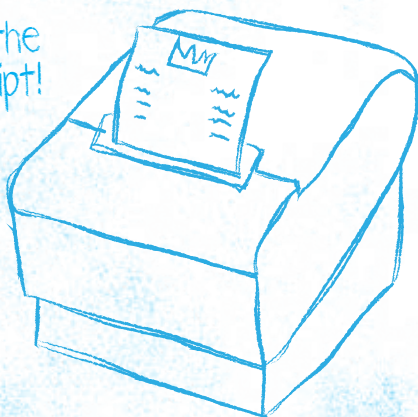




# HOW TO AVOID IT?

Go fresh instead of canned – many food cans have BPA in their linings – or research which companies don't use BPA or similar chemicals in their products. Say no to receipts, since thermal paper is often coated with BPA. Avoid plastics marked with "PC," for polycarbonate, or recycling label #7. Not all of these plastics contain BPA, but many do – and it's better safe than sorry when it comes to keeping synthetic hormones out of your body. For more tips, check out: [ewg.org/bpa](http://ewg.org/bpa)

Skip the  
Receipt!



# **DIOXIN**

## ***DIOXINS ARE MULTI-TASKERS... BUT NOT IN A GOOD WAY!***

They form during many industrial processes when chlorine or bromine are burned in the presence of carbon and oxygen. Dioxins can disrupt the delicate signaling systems of male and female sex hormones in the body. This is a bad thing!

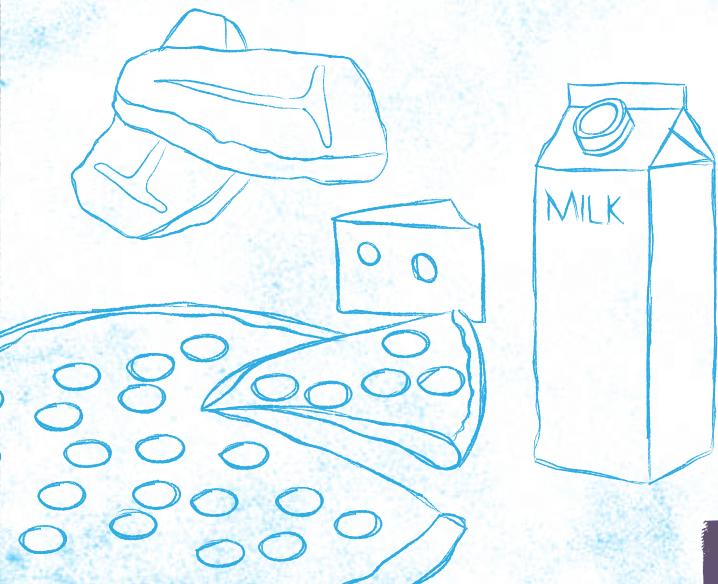
## ***HERE'S WHY:***

Recent research has shown that exposure to low levels of dioxin in the womb and early in life can permanently affect sperm quality and lower sperm count in men during their prime reproductive years. But that's not all! Dioxins are very long-lived, build up both in the body and in the food chain, are powerful carcinogens and can also affect the immune and reproductive systems.



# ***HOW TO AVOID IT?***

That's pretty difficult, since the ongoing industrial release of dioxins has meant that the American food supply is widely contaminated. Products including meat, fish, milk, eggs and butter are most likely to be contaminated. You can cut down on your exposure by eating fewer animal products.



# ATRAZINE

## *WHAT HAPPENS WHEN YOU INTRODUCE HIGHLY TOXIC CHEMICALS INTO NATURE AND TURN YOUR BACK?*

For one thing, feminization of male frogs. That's right, researchers have found that exposure to even low levels of the herbicide atrazine can turn male frogs into females that produce completely viable eggs. Atrazine is widely used on the majority of corn crops in the United States, and consequently it's a pervasive drinking water contaminant. Atrazine has been linked to breast tumors, delays puberty and prostate inflammation in animals, and some research has linked it to prostate cancer in people.



# HOW TO AVOID IT?

Buy organic produce and get a drinking water filter certified to remove atrazine. For help finding such a filter, check out EWG's buying guide: [ewg.org/report/ewgs-water-filter-buying-guide](http://ewg.org/report/ewgs-water-filter-buying-guide)

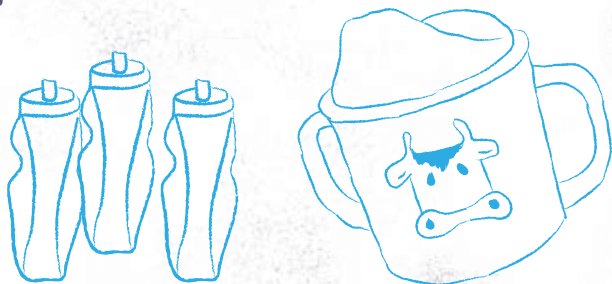
Filter your  
water!



# PHTHALATES

## *DID YOU KNOW THAT A SPECIFIC SIGNAL PROGRAMS CELLS IN YOUR BODY TO DIE?*

It's totally normal and healthy for 50 billion cells in your body to die every day! But studies have shown that chemicals called phthalates can trigger what's known as "death-inducing signaling" in testicular cells, making them die sooner than they should. Yep, that's cell death – in your man parts. If that's not enough, studies have linked phthalates to hormone changes, lower sperm count, less mobile sperm, birth defects in the male reproductive system, obesity, diabetes and thyroid irregularities.





# HOW TO AVOID IT?

A good place to start is to avoid plastic food containers, children's toys (some phthalates are already banned in kid's products), and plastic wrap made from PVC, which has the recycling label #3. Some personal care products also contain phthalates, so read the labels and avoid products that simply list added "fragrance," since this catch-all term sometimes means hidden phthalates. Find phthalate-free personal care products with EWG's Skin Deep Database: [ewg.org/skindeep](http://ewg.org/skindeep)

rattle!



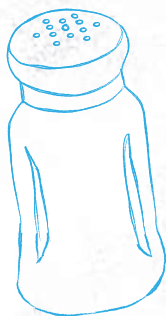


# PERCHLORATE

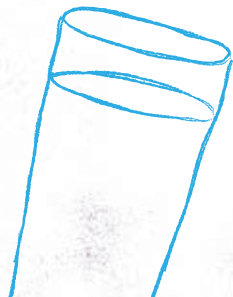
## WHO NEEDS FOOD TAINTED WITH ROCKET FUEL?!

That's right, perchlorate, a component in rocket fuel, contaminates much of our produce and milk, according to EWG and government test data. When perchlorate gets into your body it competes with the nutrient iodine, which the thyroid gland needs to make thyroid hormones. Basically, this means that if you ingest too much of it you can end up altering your thyroid hormone balance. This is important because these hormones regulate metabolism in adults and are critical for proper brain and organ development in infants and young children.

Get  
iodized  
salt

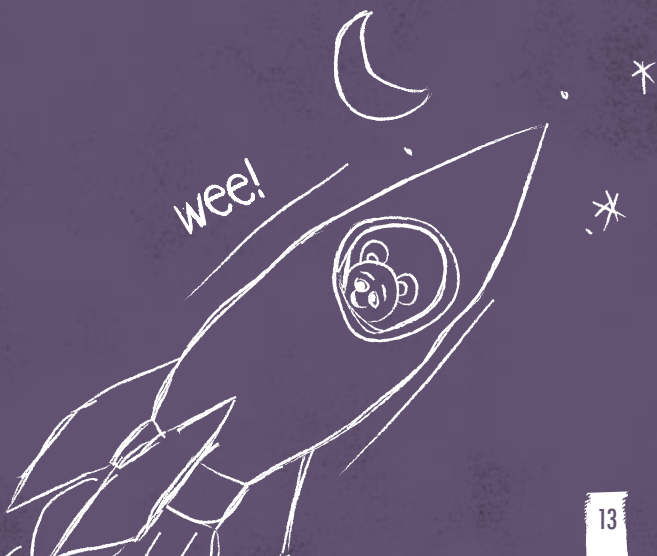


drink filtered  
water!



# HOW TO AVOID IT?

You can reduce perchlorate in your drinking water by using a reverse osmosis filter. (You can get help finding one here: [www.ewg.org/report/ewgs-water-filter-buying-guide](http://www.ewg.org/report/ewgs-water-filter-buying-guide)) As for food, it's pretty much impossible to avoid perchlorate, but you can reduce its potential effects on you by making sure you're getting enough iodine in your diet. Using iodized salt is one good way.



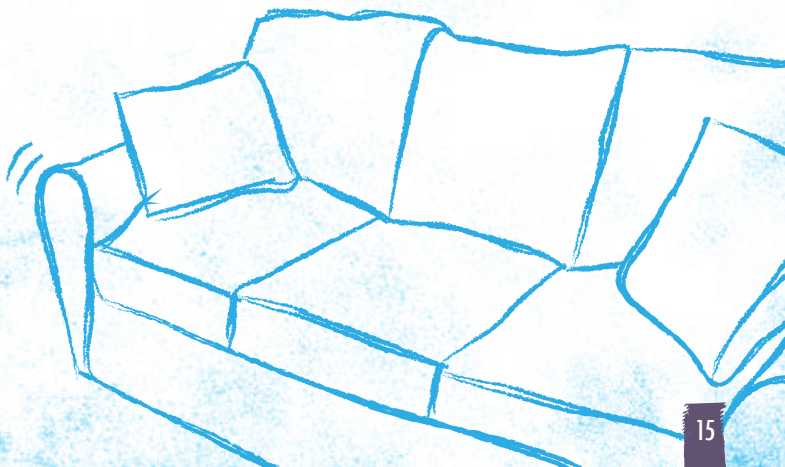
# ***FIRE RETARDANTS***

## ***WHAT DO BREAST MILK AND POLAR BEARS HAVE IN COMMON?***

In 1999, Swedish scientists studying women's breast milk discovered something totally unexpected: The milk contained an endocrine-disrupting chemical found in fire retardants, and the levels had been doubling every five years since 1972! These incredibly persistent chemicals, known as polybrominated diphenyl ethers or PBDEs, have since been found to contaminate the bodies of people and wildlife around the globe – even polar bears. These chemicals can imitate thyroid hormones and disrupt their activity. That can lead to lower IQ, among other significant health effects. Several kinds of PBDEs have now been phased out, but this doesn't mean that toxic fire retardants have gone away. PBDEs are incredibly persistent, so they're going to be contaminating people and wildlife for decades to come.

# HOW TO AVOID IT?

It's virtually impossible, but passing better toxic chemical laws that require chemicals to be tested before they go on the market would help reduce our exposure. A few things that you can try in the meantime include using a vacuum with a HEPA filter, which can cut down on toxic-laden house dust, avoiding reupholstering foam furniture and taking care when replacing old carpet (the padding underneath may contain PBDEs). Find more tips here: [ewg.org/pbdefree](http://ewg.org/pbdefree)



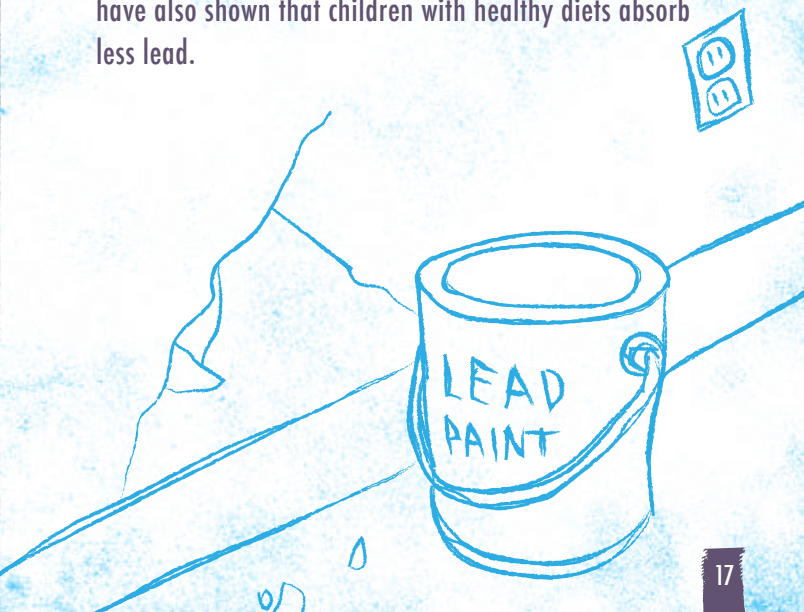
# LEAD

*YOU MAY OR MAY NOT LIKE HEAVY METAL MUSIC, BUT LEAD IS ONE HEAVY METAL YOU WANT TO AVOID.*

It's well known that lead is toxic, especially to children. Lead harms almost every organ system in the body and has been linked to a staggering array of health effects, including permanent brain damage, lowered IQ, hearing loss, miscarriage, premature birth, increased blood pressure, kidney damage and nervous system problems. But few people realize that one other way that lead may affect your body is by disrupting your hormones. In animals, lead has been found to lower sex hormone levels. Research has also shown that lead can disrupt the hormone signaling that regulates the body's major stress system (called the HPA axis). You probably have more stress in your life than you want, so the last thing you need is something making it harder for your body to deal with it – especially since this stress system is implicated in high blood pressure, diabetes, anxiety and depression.

# HOW TO AVOID IT?

Keep your home clean and well maintained. Crumbling old paint is a major source of lead exposure, so get rid of it carefully. A good water filter can also reduce your exposure to lead in drinking water. Check out [ewg.org/report/ewgs-water-filter-buying-guide](http://ewg.org/report/ewgs-water-filter-buying-guide) for help finding a filter.) If you need another reason to eat better, studies have also shown that children with healthy diets absorb less lead.





# ARSENIC

## *ARSENIC ISN'T JUST FOR MURDER MYSTERIES ANYMORE.*

In fact, this poison is lurking in your food and drinking water. If you eat enough of it, arsenic will kill you outright. In smaller amounts, arsenic can cause skin, bladder and lung cancer. Basically, bad news. Less well known: Arsenic messes with your hormones! Specifically, it can interfere with normal hormone functioning in the glucocorticoid system that regulates how our bodies process sugars and carbohydrates. What does that mean for you? Well, disrupting the glucocorticoid system has been linked to weight gain/loss, immunosuppression, insulin resistance (which can lead to diabetes), osteoporosis, growth retardation and high blood pressure.



# HOW TO AVOID IT?

Reduce your exposure by using a water filter that lowers arsenic levels. For help finding a good water filter, check out EWG's buying guide: [ewg.org/report/ewgs-water-filter-buying-guide](http://ewg.org/report/ewgs-water-filter-buying-guide)

Get a  
water filter!



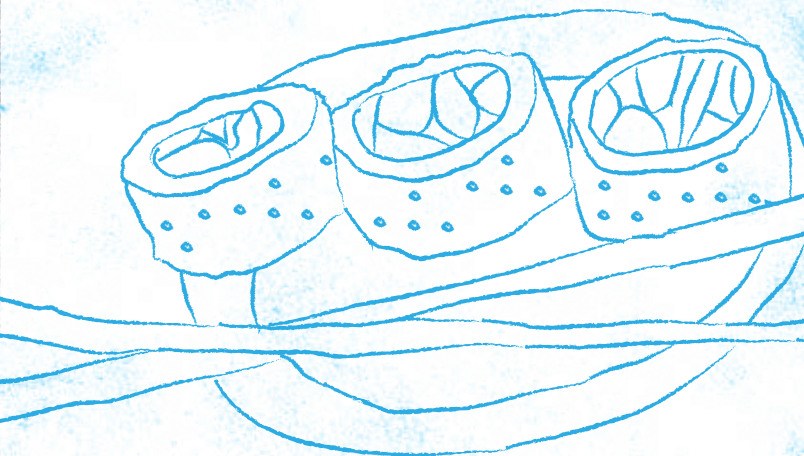
# MERCURY

*CAUTION: THAT SUSHI YOU'RE EATING COULD BE HAZARDOUS TO YOUR HEALTH.*

Mercury, a naturally occurring but toxic metal, gets into the air and the oceans primarily through burning coal. Eventually, it can end up on your plate in the form of mercury-contaminated seafood. Pregnant women are the most at risk from the toxic effects of mercury, since the metal is known to concentrate in the fetal brain and can interfere with brain development. Mercury is also known to bind directly to one particular hormone that regulates women's menstrual cycle and ovulation, interfering with normal signaling pathways. In other words, hormones don't work so well when they've got mercury stuck to them! The metal may also play a role in diabetes, since mercury has been shown to damage cells in the pancreas that produce insulin, which is critical for the body's ability to metabolize sugar.

# ***HOW TO AVOID IT?***

For people who still want to eat (sustainable) seafood with lots of healthy fats but without a side of toxic mercury, wild salmon and farmed trout are good choices.



# ***PERFLUORINATED CHEMICALS (PFCS)***

***CHEMICALS USED TO MAKE NON-STICK  
COOKWARE CAN STICK TO YOU.***

Perfluorochemicals are so widespread and extraordinarily persistent that 99 percent of Americans have them in their bodies. One particularly notorious compound called PFOA has been shown to be “completely resistant to biodegradation.” In other words, PFOA doesn’t break down in the environment – ever. That means that even though the chemical was banned after decades of use, it will be showing up in people’s bodies for countless generations to come. This is worrisome, since PFOA exposure has been linked to decreased sperm quality, low birth weight, kidney disease, thyroid disease and high cholesterol, among other health issues. Scientists are still figuring out how PFOA affects the human body, but animal studies have found that it can affect thyroid and sex hormone levels.

# ***HOW TO AVOID IT?***

Skip non-stick pans as well as stain and water-resistant coatings on clothing, furniture and carpets.





# **ORGANOPHOSPHATE PESTICIDES**

## ***ORIGINALLY PRODUCED FOR WARFARE***

Luckily, neurotoxic organophosphate compounds that the Nazis produced in huge quantities for chemical warfare during World War II were never used. After the war ended, American scientists used the same chemistry to develop a long line of pesticides that target the nervous systems of insects. Despite many studies linking organophosphate exposure to effects on brain development, behavior and fertility, they are still among the more common pesticides in use today. A few of the many ways that organophosphates can affect the human body include interfering with the way testosterone communicates with cells, lowering testosterone and altering thyroid hormone levels.

# HOW TO AVOID IT?

Buy organic produce and use EWG's Shopper's Guide to Pesticides in Produce, which can help you find the fruits and vegetables that have the fewest pesticide residues. Check it out here: [ewg.org/foodnews](http://ewg.org/foodnews)



# GLYCOL ETHERS

## *SHRUNKEN TESTICLES: DO WE HAVE YOUR FULL ATTENTION NOW?*

This is one thing that can happen to rats exposed to chemicals called glycol ethers, which are common solvents in paints, cleaning products, brake fluid and cosmetics. Worried? You should be. The European Union says that some of these chemicals “may damage fertility or the unborn child.” Studies of painters have linked exposure to certain glycol ethers to blood abnormalities and lower sperm counts. And children who are exposed to glycol ethers from paint in their bedrooms have substantially more asthma and allergies.

# ***HOW TO AVOID IT?***

Start by checking out EWG's Guide to Healthy Cleaning ([ewg.org/guides/cleaners](http://ewg.org/guides/cleaners)) and avoid products with ingredients such as 2-butoxyethanol (EBE) and methoxydiglycol (DEGME).



# KEEP A BREAST

The Keep A Breast Foundation™ is the leading youth-focused, global, nonprofit breast cancer organization. Our mission is to eradicate breast cancer for future generations. We provide support programs for young people impacted by cancer and educate people about prevention, early detection, and cancer-causing toxins in our everyday environment.

 [keep-a-breast.org](http://keep-a-breast.org)    [keepabreast](https://www.instagram.com/keepabreast)



EWG is the nation's most effective environmental health advocacy organization. We conduct game-changing, original, evidence-based research. We educate and inspire people, businesses and governments to make better decisions and take action to protect public health and the environment.

 [ewg.org](http://ewg.org)  [/ewg.org](https://www.facebook.com/ewg.org)  [@ewg](https://twitter.com/ewg)  [/EnvironmentalWG](https://www.youtube.com/EnvironmentalWG)

Please reuse and recycle.

©2013 The Keep A Breast Foundation &  
Environmental Working Group. All rights reserved