

POLICY FOCUS

The Science of the “Endocrine Disrupter” Debate

RECIPES FOR RATIONAL GOVERNMENT FROM THE INDEPENDENT WOMEN’S FORUM

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January 2014

Volume 5, Number 1

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WHAT YOU NEED TO KNOW

Americans are increasingly being told by the media and environmental activists that common consumer goods—from plastics to cosmetics to flame retardant-furniture—contain chemicals that endanger their health. These chemicals are referred to as “endocrine disrupters.” The activists charge that they affect our hormones, cause cancer, harm our children’s health, affect fetal development, and even make us fat. Many of these campaigns are targeted at women, particularly mothers, who naturally are concerned.

However, there is no evidence to suggest that the chemicals in these consumer products actually have such effects on humans at current exposure levels. In fact, these chemicals are far too weak and human exposure too low to produce any measurable impacts. Moreover, similar, naturally-occurring chemicals are found in many foods and are far more potent than synthetic chemicals, and yet humans safely consume them every day. Accordingly, there is little reason to fear such trace chemicals in consumer products.

These alarmist headlines, however, do result in harm to consumers: They lead to unnecessary regulations and decisions by manufacturers that lead to higher prices, fewer choices, and inferior products. Indeed, products may ironically become less safe as a result of this dynamic as manufacturers substitute away from known, effective chemical additives and use less tested, less effective alternatives.

Consumers ought to get the facts, ignore the alarmist headlines, and discourage regulators and producers from taking action based on groundless fears.

WHY YOU SHOULD CARE

We all want to live healthy and make good choices for our families and ourselves. Here are a few reasons to get informed about the real science behind the “endocrine-disrupter” debate:

- **Living in fear is unhealthy:** Activist-generated media hype creates needless fear of chemicals in consumer products. Knowing the truth about this issue will alleviate stress.
- **Alarmism leads to higher prices:** Chemical bans and even voluntary actions based on bad science lead manufacturers to reformulate products unnecessarily, raising production costs and prices.
- **Forced reformulation reduces product quality and consumer choice:** Manufacturers initially selected certain chemicals to make their products because they work. Reformulations often rely on second-best alternatives that produce inferior products. Unnecessary regulations and product substitutions also reduce consumer choice by eliminating safe and effective products. In some cases, many valued brands and products may completely disappear.
- **Fear-generated policy will undermine public health.** Businesses may be forced to use less tested, newer products that pose greater risks. For example, California activists are targeting flame retardants in children’s foam bedding, which could encourage manufacturers to use inferior products or no flame retardants at all, increasing risks associated with fire-related deaths and injuries.

MORE INFORMATION

What Is an “Endocrine Disrupter”?

Endocrine systems in both humans and animals consist of a series of glands that secrete hormones and send messages throughout the body. Working in conjunction with the nervous system, these messages trigger various responses, such as growth, maturation of reproductive systems, and contractions during pregnancy. Foreign chemicals can disrupt proper functioning of the endocrine system and lead to health problems. Environmentalists refer to such external chemicals as endocrine disrupters, but others use more neutral terms because not all effects are negative or substantial. The **American Council on Science and Health** (ACSH) calls them endocrine modulators, while the **National Research Council** (NRC), which is a division of the National Academy of Sciences, calls them “hormonally active agents.”

As a panel of scientists assembled by the **ACSH explained**: “Aside for exposure itself, perhaps the two most important factors [for understanding the effects of endocrine disrupters] are potency and dose.” The ACSH report notes that to put exposure rates in perspective people should compare the potency of the exposure to synthetic chemicals to that of the human estrogen, 17b-estradiol, which is

commonly used in medications such as birth control and for hormone replacement therapy. Scientists have found the synthetic chemicals DDT and PCBs (the most studied chemicals claimed to be endocrine disrupters) to be up to *one million times* less potent than 17 β -estradiol when used in similar doses.

Relevance to Human Health

Some studies report that synthetic chemicals produce health effects in rodents or other lab animals that are exposed to concentrated, extremely high amounts of such substances. And there is some **evidence of effects on wildlife** exposed to high levels of chemicals that have long since been banned or restricted, such as DDT, and no longer pose much concern as levels in the environment **decreased substantially**.

The relevance of these animal studies to human health is limited since people's typical exposure to these agents is **multitudes lower** than exposure levels in the study. In its review of the issue, the **NRC** found no compelling body of data demonstrating health effects on humans from trace synthetic chemical exposures, which is what occurs from regular use of typical consumer products. In a recent review of the research on the topic, **researchers reported**: "Overall, despite of 20 years of research a human health risk from exposure to low concentrations of exogenous chemical

substances with weak hormone-like activities remains an unproven and unlikely hypothesis."

Effects of endocrine-disrupters on humans have only been demonstrated when both dose and potency has been high, such as in medical administration of hormones. For example, the National Cancer Institute **attributes** some breast cancers to hormone replacement therapy used to help women cope with menopause.

Similarly, between 1940 and 1970, many women took the drug diethylstilbestrol (DES) to prevent miscarriages, but it was eventually associated with higher incidences of reproductive problems. Toxicologist Stephen Safe notes in *Earth Report 2000*: "DES is not only a potent estrogen, but it was administered at relatively high doses.... In contrast, synthetic environmental endocrine-disrupting compounds tend to be weakly active."

Anti-chemical activists misuse the DES story to hype risks about chemicals whose estrogenic potency and exposure is nowhere near that of this drug. For example, in a **June 2013** study on the chemical Bisphenol A (BPA), which is used to make hard-clear plastics and resins that line food cans, researchers toss in a reference to DES as if it were relevant, noting: "BPA, like DES, acts on estrogen receptors which could lead to obesity in a gender-specific and dose-response manner." Even the *New England Journal of Medicine* published a **commentary** in 2011 that alluded to the DES situation as evidence that chemicals in

the environment posed a risk—despite the low dose and weak potency. Steve Milloy **exposes the absurdity** of this suggestion, pointing out: “DES was designed to be a hormone and it was. It was not some treatment that inadvertently acted like a hormone or disrupted hormones. It functioned like it was intended.”

Naturally-Occurring “Endocrine Disrupters” in Food

The entire theory that manmade chemicals are causing significant endocrine disruption falls apart when you consider exposures to naturally-occurring endocrine-mimicking chemicals. Plants naturally produce such chemicals called *phytoestrogens*, to which we are exposed at levels that are thousands of times higher than those of synthetic chemicals. Human exposure levels to synthetic estrogens is minute, particularly when **compared to** that of naturally occurring estrogens found in fruits and vegetables.

As researcher Jonathan Tolman **points out**, humans consume these naturally-occurring endocrine-mimicking chemicals every day without ill effect. In fact, he explains that tests have found such chemicals in 43 foods in the human diet such as soy, which is used in hundreds of products that we safely consume on a regular basis. Phytoestrogens like those found in soy and other foods are 1,000 to 10,000 times more potent than synthetic estrogens, and

the estrogenic effects of the total amount we consume are as much as **40 million times** greater than those of the synthetic chemicals in our diets.

The data strongly indicate that there is little reason to worry about the impact of trace chemicals on human endocrine systems. Unfortunately, misinformation will continue to guide this debate and public policy until consumers access and respond to more balanced information.

The High Cost of Alarmism about Endocrine Disrupters

Alarmism surrounding “endocrine disrupters” leads to unnecessary chemical bans and voluntary actions that force manufacturers to reformulate products unnecessarily. Such forced product reformulation ignores the fact that manufacturers initially selected certain chemicals because those chemicals provide the best product performance. Accordingly, reformulations often rely on second-best alternatives that may produce inferior products that cost more. In some cases, valued brands and products may completely disappear when there isn’t a good substitute for a banned chemical.

For example, a number of manufacturers have decided to eliminate use of an anti-bacterial chemical called triclosan, which has been safely used for more than four decades in soap, toothpaste and anti-bacterial gels. Despite good scientific evidence that the chemical does reduce bacterial-related risks, many manufacturers are

voluntarily removing it from consumer products—at the urging of retailers such as Walmart—and states are even considering bans. As a result, consumers may have fewer options for anti-bacterial soaps and gels that reduce certain bacterial risks, such as Salmonella, and some toothpaste brands may become less effective at controlling cavity-forming bacteria in the mouth. In addition, manufacturers will have to increase production costs if they decide to research and develop alternatives.

Calls for bans and alarmism about the chemical BPA offer another example. BPA has been under attack for more than a decade, yet the overwhelming body of science on BPA shows that its benefits outweigh the risks. The Food and Drug Administration recently reaffirmed its finding that BPA use for food packaging is safe and beneficial. And other research shows that exposure levels through these products are truly insignificant.

Still, some lawmakers want to ban BPA use in food packaging, such as Sen. Ed Markey (D-Mass.), who introduced the “Ban Poisonous Additives Act of 2014.” But the BPA-based resins that line food containers prevent the development of deadly pathogens in our food supply, protecting consumers from dangerous bacteria like *E. coli*. Because there aren’t good alternatives to BPA resins, if passed into law, BPA bans could increase food spoilage and serious food-borne illnesses.

Similarly, in California, activists are targeting flame retardants in children’s foam bedding, which

could encourage manufacturers to use inferior products or no flame retardants at all, increasing risks associated with fire-related deaths and injuries.

Finally, the needless worry created by activist-generated media hype is itself a problem. Americans—particularly American women who are the primary targets of this alarmism—don’t need unnecessary stress in their lives. Women should understand that consumers face no meaningful risk from the proper use of common consumer products and cross that worry off their list.

Chemicals and Obesity

Some researchers have given a new spin to the endocrine disrupter theory, suggesting that it may play a role in the nation’s obesity problem. Researchers in the field of “epigenetics,” which involves the study of how environmental factors (i.e., factors other than DNA) can influence how genes express themselves and how those changes can be passed down from one generation to the next. For example, a person’s diet or even stress levels may influence gene expression, and those traits may be inheritable.

Some researchers claim that synthetic chemicals are now changing our gene expression to make us and our children gain weight. They even coined a buzzword “obseogens” to describe the alleged phenomenon, which helped lead to provocative headlines among a wide range of sources from mommy blogs to *The Atlantic*.

This theory is highly speculative with the underlying research suffering from many confounding factors and limitations, and results have not been reproducible. Consumers and the media should recognize the limitations of this research. The clever marketing of this theory may be leading some to believe that they are pre-programmed to become fat, discouraging them from taking positive action to prevent or reverse obesity. Meanwhile, there is a far more compelling body of evidence that obesity is related to overeating and lack of exercise.

WHAT YOU CAN DO

You can learn more about how everyday interaction with chemicals in consumer products does not pose a significant risk and spread the word that there is no reason to live in fear.

- **Get Informed:** To learn more visit:
 - [Independent Women's Forum](#)
 - [SafeChemicalPolicy.org](#)
 - [CultureOfAlarmism.com](#)
- **Talk to Your Friends:** Don't let your friends and family live in fear because of misinformation and hype. Share this paper and what you have learned so they too can better understand these important issues. Encourage them to spread the word, and get them involved.

- **Become a Leader in the Community:** Get a group together each month to talk about a political/policy issue, starting with this one (it will be fun!). Write a letter to the editor. Show up at local government meetings and make your opinions known. Go to rallies. Better yet, organize rallies! A few motivated people can change the world.
- **Remain Engaged:** Too many good citizens see election time as the only time they need to pay attention to politics. We need everyone to pay attention and hold elected officials accountable. Let your Representatives know your opinions. After all, they are supposed to work for you.

ABOUT THE INDEPENDENT WOMEN'S FORUM

The Independent Women's Forum (IWF) is dedicated to building support for free markets, limited government, and individual responsibility.

IWF, a non-partisan, 501(c)(3) research and educational institution, seeks to combat the too-common presumption that women want and benefit from big government, and build awareness of the ways that women are better served by greater economic freedom. By aggressively seeking earned media, providing easy-to-read, timely publications and commentary, and reaching out to the public, we seek to cultivate support for these important principles and encourage women to join us in working to return the country to limited, Constitutional government.

We rely on the support of people like you! Please visit us on our website www.iwf.org to get more information and consider making a donation to IWF.

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