



The **Endocrine Policy Forum (EPF)** is a consortium of scientific and regulatory experts coordinating industry participation in the U.S. Environmental Protection Agency's efforts to screen chemicals for endocrine activity. EPF's mission is to bring balanced, science- and risk-based analysis to scientists, medical professionals and regulators in the U.S. and beyond to ensure chemicals are properly screened, tested and regulated for endocrine activity and the potential to cause adverse health effects.

For more information, visit:  
[endocrinepolicy.org](http://endocrinepolicy.org)

**Further reading on the safe use of products containing chemicals:**

- [chemicalsafetyfacts.org](http://chemicalsafetyfacts.org)
- [cleaninginstitute.org](http://cleaninginstitute.org)
- [cosmeticsinfo.org](http://cosmeticsinfo.org)
- [cpsc.gov](http://cpsc.gov)
- [cspa.org](http://cspa.org)
- [croplife.org](http://croplife.org)
- [endocrinescience.org](http://endocrinescience.org)
- [endocrinesciencematters.org](http://endocrinesciencematters.org)
- [epa.gov](http://epa.gov)
- [fda.gov](http://fda.gov)
- [gmaonline.org](http://gmaonline.org)

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**ENDOCRINE  
ACTIVE  
CHEMICALS**

**DISRUPT THE  
CONFUSION  
WITH FACTS**

***Replacing Myths with  
Evidence-Based Science***



**Unfounded claims.**  
**Sensationalized headlines.**  
**Conflicting Information.**

Patients and healthcare professionals alike are inundated with unproven allegations about the health effects of common chemicals on our endocrine systems. How do you form a clear opinion of your own and weed out the myths on endocrine active chemicals?

**The best place to start is with the facts...**

## A Balancing Act

The human endocrine system is dynamic, constantly monitoring and adjusting to changes in the environment, much like the way a thermostat helps to regulate the temperature in our homes. It does this to help our bodies maintain homeostasis – a state of balance.



## MYTH vs SCIENCE



### ENDOCRINE ACTIVE CHEMICALS AND OUR HEALTH

#### MYTH

“ Exposure to endocrine active chemicals will result in adverse health effects. ”

#### SCIENCE

Some chemicals (natural and man-made) are “endocrine active” – which means they can interact with the endocrine system. However, you should know that this interaction does not necessarily result in adverse health effects. Humans can be exposed to endocrine active chemicals at levels, durations, and timing well within the range scientists have determined to be safe. The vast majority of the endocrine active substances that scientists have studied to date have not been demonstrated to cause adverse health effects at typical exposures.

**Endocrine active chemicals include natural substances in coffee and soy, and healthy oils in salad dressings and other foods.**



## MYTH vs SCIENCE



### REGULATION AND CONSUMER SAFETY

#### MYTH

“ Chemicals are widely untested and unregulated with inconsistent oversight. ”

#### SCIENCE

It's important to know that chemicals are being screened for endocrine effects. As just one example, the U.S. EPA developed a step-by-step, science-based process to identify endocrine-active chemicals, and chemicals that cause adverse health effects as a result of their interaction with the endocrine system (endocrine disruptors). To understand the potential risk of harm, scientists at EPA consider the real-world scenarios in which people come into contact with substances.

Products are designed to be safe for their intended uses. To limit exposure levels, everyone should read product labels and follow directions carefully. Some low-level exposures will not lead to endocrine activity at all, while others may elicit transient responses to which the body can naturally adjust and maintain normal functioning. The primary focus should be on limiting over-exposures so that potential health risks are avoided.



### ENDOCRINE ACTIVITY: BENEFICIAL, NEUTRAL, ADVERSE

#### MYTH

“ The only effect that endocrine active chemicals can have on our bodies is an adverse one; there is no 'safe' level of endocrine activity. ”

#### SCIENCE

The endocrine system's response to a chemical can have either a beneficial, adverse or neutral effect. The endocrine system naturally responds to exposure from our environment, both chemical and physical. For example, a change in temperature, food or daylight can affect the level of hormones circulating in our body.

How a chemical interacts with the endocrine system depends on a variety of factors, including the:

- ✓ Type and duration of the exposure to the chemical
- ✓ Frequency of exposure
- ✓ Potency of the chemical substance
- ✓ Ways in which the body absorbs and eliminates the substance

## EXAMPLES OF CHEMICAL INTERACTIONS

### BENEFICIAL

Sunlight exposure stimulates our skin to produce Vitamin D, which is converted to the active hormone calcitriol by the liver and kidneys. Excess Vitamin D is stored in fat and released into the blood at times of low sunlight exposure. It is critical for absorption and regulation of calcium and phosphorus and for healthy organ and bone function.



### NEUTRAL

Plant-based soy phytoestrogens found in many foods have the potential to interact with the estrogen receptor. But scientific studies of large populations of healthy women have shown either no association between soy and breast cancer, or a protective association, meaning that women who consumed higher levels of soy had less breast cancer.



### ADVERSE

Steroidal estrogens such as those contained in the birth control pill have the potential to increase the frequency with which wild freshwater fish have altered sexual organs. Research in the UK has shown that when sewage discharge treatment has been insufficient to remove these estrogen contaminants, the reproductive tract of wild populations of male fish can be affected.



## Defining the Risk: Key Terms



RISK

Risk is the probability of a harm arising from a particular exposure to a chemical substance, under specific conditions.



HAZARD

Hazard refers to the type of harm that a chemical may cause under some conditions. In many cases, those conditions may not even exist in the environment in which humans or animals live.



DOSE

Dose is the amount of substance that enters the body or contacts sensitive tissues.



DOSE  
RESPONSE

Dose response refers to a determination of the dose at which a particular response will occur in a specific test system.



EXPOSURE

Exposure describes the concentration, duration, timing and frequency with which a chemical substance comes into contact with a person, group of people or the environment.



SAFE  
EXPOSURE  
LEVEL

A safe exposure level refers to the timing, amount, frequency, and duration with which a person can be exposed to a potential hazard without experiencing an adverse health effect.