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Endocrine disruptors Part II – How you can avoid them

With reference to part 1: Every organism on Earth has an endocrine system for the regulation of their bodies. Hormones (chemical messengers) are produced by the glands of this system to help with the coordination of body functions. However, endocrine disruptor chemicals (EDCs), that mimic hormones, interact with cell receptors causing adverse health effects which result in negative consequences to the body. In the next paragraphs, you will read about the impacts of these EDCs such as bisphenol A, which are commonly found in our environment.

When they are released into the environment, EDCs trigger adverse effects in some wildlife populations. These vary from subtle changes in body function and sexual behavior to permanent effects on sex organ development. Here are two examples illustrating their effects on wildlife:

- Eggshell thinning and altered sex organ development have been observed in birds of prey exposed to the organochlorine insecticide called DDT, resulting in a severe decline in their populations.
- There is extensive evidence that chemicals found in the waste outflows from pulp and paper mills and sewage treatment plants can affect reproduction and development of fish.

Concern has been raised that these chemicals can impair human health through interference with the endocrine system. Evidence linking EDCs to adverse health outcomes continues to grow. Generally, chronic high exposures pose the highest risk; however, a developing fetus or infant is more vulnerable to lower exposures. Possible documented effects of EDCs on reproduction relate to sperm quality, abnormalities of male sex organs, endometriosis and more. Note that some EDCs





may affect development of the nervous and the immune systems. A person's genetic predisposition to specific health conditions, as well as additional environmental risk factors can modify how a person will be affected by EDCs. Many factors affect the toxicity of EDCs on human health such as the level of exposure, the timing, the duration of exposure and the types of EDCs one is exposed to.

Here is the case of bisphenol A (BPA): It is a synthetic organic compound belonging to the group of bisphenols. BPA is a precursor in the fabrication of commonly used plastics, and in certain polycarbonates and epoxy resins. BPA is also a xenoestrogen, exhibiting estrogen-mimicking, hormone-like properties. In other words, BPA has the capacity to interrupt the network that regulates the signals which control the reproductive development in humans and animals. As of 2014, research and debates are ongoing as to whether BPA should be banned or not. Since then, BPA-free plastics have been manufactured using alternative bisphenols, but there is controversy around whether these are actually safer. For example, the bisphenol S (BPS) is used as a substitute for BPA. But BPS could cause cardiac toxicity and present effects on obesity (BPS leads to the formation of new fat cells as exposure to it increases the expression of related markers to the production of these cells.). Moreover, BPS is more resistant to environmental degradation than BPA; therefore, BPS is recognized to stay longer in the body than BPA, and so it can cause more health effects.

It is important to substitute chemicals of concern with least to nontoxic alternatives. The multitude of possible endocrine disruptors are technically regulated in the United States by many laws, such as the Safe Drinking Water Act or the Clean Water Act. Also, international restrictions and bans on many pesticides (types of EDCs) are established, such as in the Rotterdam Convention. Moreover, there is evidence that once a pollutant is no longer in use, or once its use is heavily restricted, the human body burden of that pollutant declines. Note that studies suggest that BPA and phthalates are eliminated from the human body through sweat.

Since EDCs are found almost everywhere, the best way to reduce exposure to them is to read labels, ask questions, buy and use only organic products for everyday living—such as organic food, natural or organic clothing and other household items. By doing this, you will have more control on what you bring into your home



and be less exposed to these man-made chemicals. To help you with your choices, you can visit ASEQ-EHAQ's Eco Living Guide (www.EcoLivingGuide.ca).

Online links :

- Endocrine disruptors, GreenFacts – Facts on health and the environment, Morris & Chapman, last update on March 14th 2004, <https://www.greenfacts.org/en/endocrine-disruptors/endocrine-disruptors.htm>
- Endocrine disruptor, Wikipedia, the free encyclopedia, last modification made on November 26th 2020, https://en.wikipedia.org/wiki/Endocrine_disruptor
- Bisphenol S, Wikipedia, the free encyclopedia, last modification made on December 31st 2020, https://en.wikipedia.org/wiki/Bisphenol_S
- Bisphenol A, Wikipedia, the free encyclopedia, last modification made on January 2nd 2021, https://en.wikipedia.org/wiki/Bisphenol_A
- Endocrine-Disruptors Chemicals EDCs, by Daniel Ruiz and Heather Patisaul, Hormone health network, The Endocrine Society, copyright in 2021, <https://www.hormone.org/your-health-and-hormones/endocrine-disrupting-chemicals-edcs>
- Restrictions and bans, Pesticide Registration Toolkit, Food and Agriculture Organization of the United Nations (FAO), copyright in 2021, <http://www.fao.org/pesticide-registration-toolkit/information-sources/restrictions-and-bans/en/>