Pesticides and Endocrine Disruption

Common household products –detergents, disinfectants, plastics, and pesticides– contain chemical ingredients that enter our bodies, disrupt hormones and cause adverse developmental, disease, and reproductive problems. Known as endocrine disruptors, these chemicals, which interact with the endocrine system, wreak havoc in humans and wildlife.

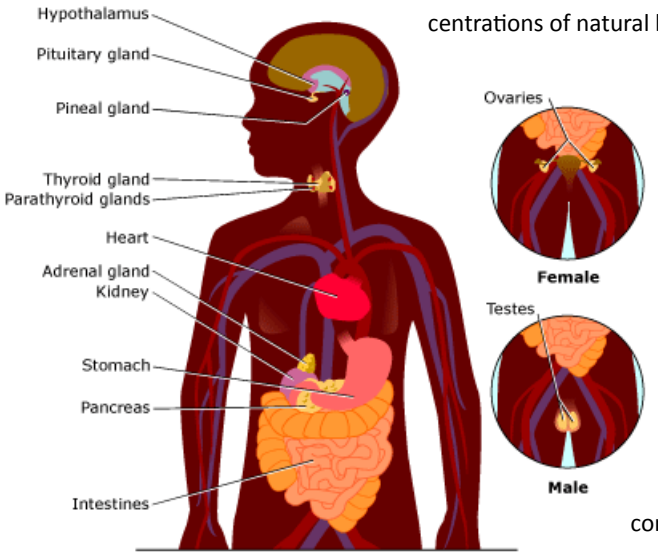
In 2007 - 11 years after its Congressionally mandated deadline, the Environmental Protection Agency (EPA) published a list of 67 pesticide ingredients that it intends to review for endocrine disrupting effects, once it finalizes its standards for review. The list includes only 29 of the 56 pesticides identified as known or suspected endocrine disruptors by the European Union and endocrine disruptor expert Theo Colborn, PhD, co-author of *Our Stolen Future*. Experts have called EPA's program inadequate.

What is the Endocrine System?

The endocrine system consists of a set of glands (thyroid, gonads, adrenal and pituitary) and the hormones they produce (thyroxine, estrogen, testosterone and adrenaline), which help guide the development, growth, reproduction, and behavior of animals, including humans. Hormones are signaling molecules, which travel through the bloodstream and elicit responses in other parts of the body.

Disrupting the Endocrine System

Endocrine disruptors function by: (i) Mimicking the action of a naturally-produced hormone, such as estrogen or testosterone, thereby setting off similar chemical reactions in the body; (ii) Blocking hormone receptors in cells, thereby preventing the action of normal hormones; or (iii) Affecting the synthesis, transport, metabolism and excretion of hormones, thus altering the concentrations of natural hormones.



The Endocrine System

Exposure may occur in the womb, through the air we breathe at home, in the workplace or at school, or through residues in our food and water. Endocrine-disrupting chemicals have been reported in semen, the ovarian follicle, the womb, and in breast milk at elevated concentrations.

Health Effects

Endocrine disruptors have been linked to attention deficit hyperactivity disorder (ADHD), Parkinsons, Alzheimers, diabetes, cardiovascular disease, obesity, early puberty, infertility and other reproductive disorders, and childhood and adult cancers.

Reproductive health - Reproductive specialists attribute a worldwide sperm count decline by approximately 50% since the1930s to exposures to high concentrations of estrogens or estrogen-like substances during embryonic, fetal, and early postnatal development. The onset of puberty in girls, shifting the mean from 11.2 years to 8.9 years for African Americans and 10.0 years for Caucasian girls, is linked to chemical exposure that stimulates sex hormones.

Neurodevelopment - Scientists believe that neurological disorders observed in children, such as ADHD and autism, may be related to the prenatal chemical disruption of the thyroid system. Certain pesticides are believed to alter thyroid function, interfere with brain development and cause deficits in cognitive functions in the developing fetus. Other effects include physical and mental retardation, alterations of the cardiovascular system and musculoskeletal defects, alterations of the menstrual cycle, obesity, and failure to develop secondary sex characteristics.

Environmental effects

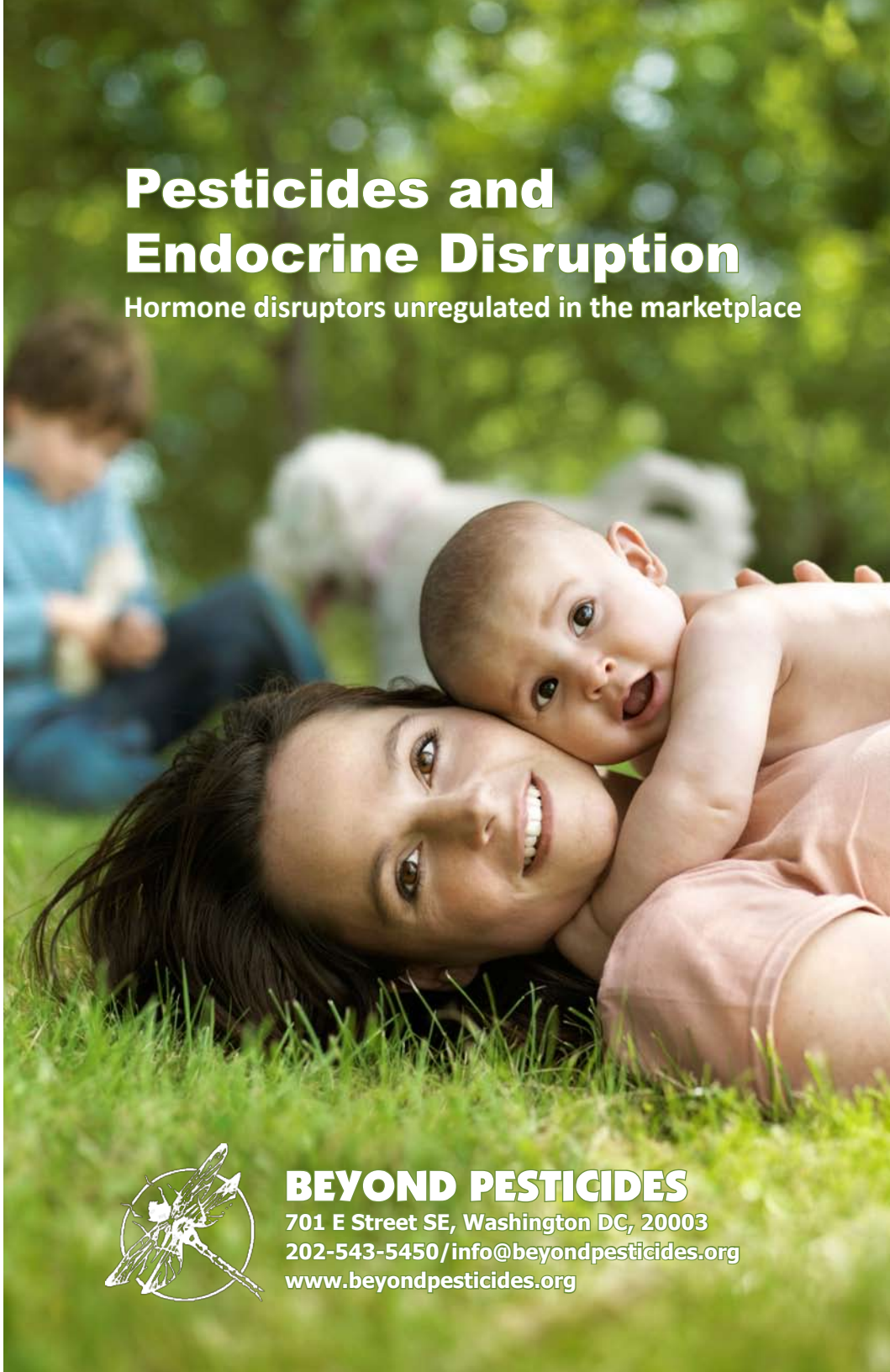
Hermaphroditic frogs, polar bears with penis-like stumps, panthers with atrophied testicles and intersex fish with immature eggs in their testicles have all been linked to endocrine disruption. The popular herbicide atrazine chemically castrates and feminizes exposed male tadpoles. The mosquito-killing S-methoprene larvicide alters early frog embryo development. Distorted sex organ development and function in alligators is linked to the organochlorine insecticide dicofol. The ubiquitous antibacterial chemical triclosan alters thyroid function in frogs, while its chemical cousin triclocarban enhances sex hormones in rats and in human cells.

What Can You Do?

Avoid all pesticides, but especially those linked to endocrine disruption (see back page). Eat organic food, manage your home and yard without pesticides and help end pesticide use in schools and the broader community. To get started, visit www.beyondpesticides.org/doorway/activisttools.htm. In 2009, Rep. Jim Moran (D-VA) and Senator John Kerry (D-MA) introduced *The Endocrine Disruption Prevention Act*. Contact Beyond Pesticides for the latest information on this and other legislation.

List of known or suspected endocrine disrupting pesticides (Sources: European Union and *Our Stolen Future*)

Pesticide	Listed by	EPA Review
2,4-D	EU	Yes
Acephate	EU	Yes
Acetochlor	Colborn, EU	No
Alachlor	Colborn, EU	No
Aldicarb	Colborn, EU	Yes
Allethrin	Colborn, EU	Yes
Amitrole	Colborn, EU	No
Atrazine	EU	Yes
Bifenthrin	Colborn, EU	Yes
Carbaryl	Colborn, EU	Yes
Carbofuran	EU	Yes
Chlorpyrifos	Colborn	Yes
Clofentezine	Colborn	No
Cypermethrin	Colborn	Yes
Diazinon	Colborn, EU	Yes
Dicofol	Colborn, EU	Yes
Dimethoate	EU	Yes
Diuron	EU	No
Endosulfan	Colborn, EU	Yes
Fenarimol	Colborn	No
Fenbuconazole	Colborn	No
Fenitrothion	Colborn, EU	No
Fenvalerate	Colborn	Yes
Fipronil	Colborn	No
Hexachlorobenzene	EU	No
Iprodione	Colborn, EU	Yes
Lamda-cyhalothrin	Colborn, EU	No
Lindane	Colborn, EU	No
Linuron	Colborn	Yes
Malathion	Colborn, EU	Yes
Mancozeb	Colborn, EU	No
Maneb	Colborn, EU	No
Methomyl	Colborn, EU	Yes
Methyl bromide	EU	No
Methyl parathion	EU	Yes
Metribuzin	EU	Yes
Pendimethalin	Colborn	No
Pentachloronitrobenzene	Colborn	No
Pentachlorophenol	Colborn, EU	No
Permethrin	Colborn, EU	Yes
Piperonyl butoxide	EU	Yes
Prodiamine	Colborn	No
Propanil	EU	No
Pyrimethanil	Colborn	No
Resmethrin	EU	Yes
Simazine	EU	Yes
Sumithrin	Colborn, EU	No
Thiazopyr	Colborn	No
Thiram	Colborn, EU	No
Triadimefon	Colborn, EU	Yes
Triadimenol	Colborn, EU	No
Trifluralin	Colborn, EU	Yes
Vinclozolin	Colborn, EU	No
Ziram	Colborn, EU	No



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Hormone disruptors unregulated in the marketplace

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