DECEMBER 2020 | ISSUE NO. 1

Pretty Hurts

THE REPRODUCTIVE PRICE OF BEAUTY

TOXIC RACISM

Analyze the gendered and racialized norms that affect beauty standards.

BEAUTY MADE BETTER

How to choose safer alternatives for your personal care products.

All images sourced from Canva Pro

Editors' Note

Exposure to chemicals is inevitable in a society that relies so heavily on the use of personal care products (PCPs) for cleanliness, beauty, and physical enhancement. Unfortunately, chemicals in the products we consider so essential to our lives have plagued the world with lasting health outcomes. In this magazine, we focus specifically on endocrine disrupting chemicals (EDCs): toxic chemicals known to interfere with hormonal systems and homeostatic function, including metabolism, thermal regulation, and reproduction. The effects of EDCs have encouraged activists to investigate the true toxicology of approved substances while questioning where regulatory responsibility lies. Individuals who use personal care products such as lotion, shampoo, tampons, pads and sunscreen are exposed to a great degree of EDCs that can interfere with reproductive health. Specifically, modern beauty standards have influenced the idea that women must use an excessive amount of PCPs, putting them at a greater risk of exposure. Significant attention and research must be focused on the identification, prevention, and outcomes that result from EDCs in personal care products. This magazine outlines the historical, legislative, social and biological perspectives that have led to the currently accepted use of EDCs in personal care and cosmetic products. We believe that women deserve a fair chance at optimal reproductive health, and recent efforts to reduce harmful exposures have not been strong enough.

We acknowledge that the use of personal care products is not particular to one gender. The intention of this magazine is to spread awareness about the harmful effects of EDCs that many individuals are exposed to regardless of their gender identity. Though this magazine discusses the effects of endocrine disrupting chemicals on the female reproductive system, including the ovaries, uteri, and breasts, we do not intend to exclude any individual with these organs by using the terms "woman" or "female". We have focused our attention on the strong correlation between declining reproductive health and the excessive marketing of personal care products towards women; however, we do not wish to perpetuate binary gender roles by doing so.

Joussie Camacho, Fiona Griffin, Alyssa Moreno, Lindsey Snetsinger & Leah Thomas

“

THE ULTIMATE ANSWER IS TO USE LESS TOXIC CHEMICALS SO THAT THE PUBLIC HAZARD FROM THEIR MISUSE IS GREATLY REDUCED.

”

RACHEL CARSON, *SILENT SPRING*

PRELIMINARY UNDERSTANDINGS

BY FIONA GRIFFIN

How can we understand the complexities of an endocrine disrupting chemical? What is the endocrine system? To start, we can begin by recounting past scientific knowledge and comprehension. Our historical narrative of endocrine disrupting chemicals (EDCs) begins with a disjointed understanding of interactions of the body and the environment. Before the field of endocrinology emerged, only a blurred association was known to exist between health effects and particular chemicals. Little was realized about mechanisms of action, systems affected, nor how humans were exposed.

Image from Pinterest, By Geoff Hagins

An advertisement for hormone cream demonstrating the lack of understanding of mechanistic endocrine signalling in the 20th century.

So how can we situate ourselves in this historical context?

To begin, we can imagine how the body was conceptualized. Since the seventeenth century, the endocrine system was understood to participate in almost all aspects of system functionality in humans, such as growth, metabolism, reproduction, digestion, excretion, sexual differentiation and maturity. It was known that chemical messengers, dubbed "hormones" communicated with particular glands and organs to maintain homeostatic functions.

Since the Dark Ages, hormones have been associated with the reproductive system, particularly in the case of male castration to mitigate sexual desires [1]. The confirmation of hormones' acting as chemical messengers occurred in the early 20th century with the discovery of secretin, a hormone controlling the release of acid during digestion [1]. The next decade witnessed an increase of scientific and anecdotal reports of animal infertility and altered reproductive morphology, sparking research motivation into hormones, chemicals, and the endocrine system. Scientists began to wonder if and how chemicals in the environment were interacting with internal messenger chemicals of the body [2].

Infertility in Animals

In the 1920s, herds of pigs in the United States became infertile after consumption of old feed filled with mold, leading American farmers to question chemical substances in their feed. The farmer's hunch was validated with the discovery of mycoestrogens, estrogen-like substances produced by pharmacologically active fungi, in the swine food [1], [3].

In Australia, enormous populations of sheep were decimated after ingesting subterranean clover Animals experienced infertility, premature births, turning out of the uterus, and milk secretion in lambs [4]. Laboratory tests of individual clover strains revealed excessive amounts of

Photo: "Young Pig"
By: Life on White
Free Licensing by Canva Pro

PRELIMINARY UNDERSTANDINGS

Animals experienced infertility, premature births, turning out of the uterus, and milk secretion in lambs [4]. Laboratory tests of individual clover strains revealed excessive amounts of phytoestrogens, chemical substances mimicking the structure of naturally occurring estrogen. This instance was dubbed the "Clover Disease," it 1940 due to its widespread devastation [4].

Further, reporting of wild-life endocrine-disrupting instances increased into the 21st century, with accounts of reproductive effects and morphological differences in aquatic animals [3]. In Japan, entire populations of female gastropod mollusks experienced imposex, the "superposition of male-type genital organs," after exposure to tributylin (TBT), a biocide meant for treatment of barnacles [5].

The mounting reports of reproductive alterations and impacts in wildlife populations created more uncertainty and concern regarding the unregulated implementation of chemicals into the environment.

Photo: "Suffolk Sheep"
By: Life on White
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A Shifting Lense

The 1962 "Silent Spring" fictional science novel by naturalist Rachel Carlson was a momentous perturbation for scientists, industrialists, farmers, and environmentalists alike. This scientific anecdote manifested into an environmental alarm, and sparked vigor and interest into the plight of treating the environment with toxic chemicals meant to decimate animal and plant populations and this inherent assumption that humans would not be affected. Carson publicly challenged the precedented scientific notion that man-made technology and science advancements would continue to serve humankind to establish control over ourselves and the world around us. Environmentalists of the time acclaimed Carson's work, including Mark Lytle, the writer of "A Gentle Subversive: Rachel Carson, Silent Spring and the Rise of the Environmental Movement". Lytle, a professor of history and environmental studies at Bard College notes Carson produced "one of the most important books of the twentieth century." Additionally, not only was Silent Spring regarded for its scientific prowess, but it's act of "storm[ing] the male-dominated bastions of business and science, which together touted... chemical nostrums" [6].

Rachel Carson: A Biographical Lense

Image of Rachel Carson; from RachelCarson.org, 2015

Rachel Carson was born on a farm in Springdale, Pennsylvania in 1907. Early in her childhood, she began writing stories about the natural world and its natural elements. In 1925, she attended Chatham University, majoring in biology and continued her education in zoology and genetics at Johns Hopkins University in 1929 [7].

However, her time as a graduate student was cut short when the Great Depression arrived. Financial trouble forced her to move back home to help support her family where she began writing and publishing articles for the U.S. Bureau of Fisheries. She wrote scripts for a weekly broadcast, and published articles discussing

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marine biology, ecology and conservation. By 1936, she had become the Editor in Chief of the U.S. Fish and Wildlife Services. In 1941, Carson transformed her previous research articles into her first prose scientific novel titled, "Under the Sea-Wind."

She followed with two more scientific compositions, "The Sea Around Us," (1952) and "The Edge of the Sea" (1955). She received global accolades for the novels; her scientific publications catapulted her to fame and established her as a leading voice for environmentalism and ecological science. Her writings addressed topics from climate change [8].

Chemicals used in World War II prompted Carson to warn the public in "Silent Spring." She acknowledged the safety concerns of chemical exposure to humans and animals alike, and contested the status quo, becoming the environmental revolutionary voice of her time [7].

In 1964, just two years after the peak of her career, Carson passed away from breast cancer. After her death, Carson was honored a for her prowess with awards including the Presidential Medal of Freedom (1980), the National Women's Hall of Fame (1973), the dedication of Rachel Carson College at UC Santa Cruz (2016), and the founding of the Munich Rachel Carson Center for Environment and Society (2009). Today, she remains a force for ethical environmentalism and science [8].

Advertisement for DES, obtained from "Journal of a DES Daughter," 2020

DES

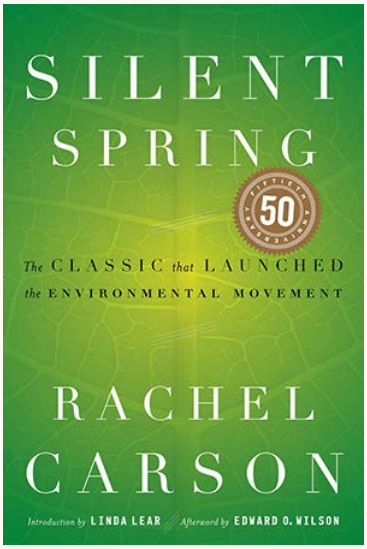
In the 1960s and 1970s, millions of pregnant women were prescribed diethylstilbestrol (DES) in their first trimester to prevent miscarriages. However, daughters born to mothers using DES experienced disproportionate rates of rare vaginal cancers, and various reproductive organ deformities. Long term cohort studies divulged that exposure to DES in utero correlated with detrimental reproductive health effects for sons and daughters, and was linked with the causation of said vaginal cancers. This horrific disaster catapulted EDCs to the forefront of reproductive health research, and increased pressure on government to identify, monitor, and regulate chemicals used in industrial settings [9] [10].

EDCs in Personal Care Products of the Past

Personal hygiene and cosmetic use are long established practice of human civilization influenced by ethnic traditions, evolving concepts, and evolving beauty standards. Utilization of materials to enhance beauty is influenced by ethnic traditions, evolving concepts, and evolving beauty standards. Personal hygiene is practiced to prevent disease and prepare food [11].

Carson's "Silent Spring" has sold more than six million copies today

Image from RachelCarson.org, 2015



PRELIMINARY UNDERSTANDINGS

Advertisement for arsenic lotion to promote a paler complexion. Pale complexions became the beauty trend of the Victorian Era in the United Kingdom.

Image obtained from Global Founders London, Contributors, 2017

In post Civil war America, beauty rituals promoted the use of popular personal care products manufactured with heavy metals. Eye shadows, pimple treatments, soaps, powders and perfumes were all filled with arsenic, lead, and mercury. Today, the variety of cosmetic products and manufacturing methods have skyrocketed and introduced a new group of ubiquitous chemicals into these products. Common chemicals in personal care products that have demonstrated endocrine disrupting properties include phthalates, parabens, and triclosan, all of which will be discussed in depth in subsequent articles [12].

Yet, the discovery of EDCs in personal care products has not halted consumer's purchasing. The United States leads the global economy in cosmetic consumption expenditure, tallying at $96.3 billion dollars [11]. Additionally, women have been reported to use more products than men, putting them at greater risk for EDC exposure. The reproductive health consequences from EDCs in care products pose an immense threat for future female generations. Therefore, the future use and manufacturing of personal care products must include simultaneous efforts to raise public awareness, require increased regulation, and continuing research.

Green hands from arsenic use. Arsenic is a toxic chemical that causes skin lesions and cancer.

Image obtained from Historic Denver, Reeves, 2017

Background Photo: "Belly of a Pregnant Woman"
By: Pixabay
From: Canva Pro

FAQs

by Joussie Camacho

Answering some of your questions about the chemicals and ingredients commonly found in your personal care and cosmetic products and the systems they affect in your bodies.

1 What is the endocrine system?

The endocrine system is a network of glands and organs that secrete hormones, the body's chemical messengers, directly into the bloodstream.

2 What are endocrine disrupting chemicals?

Endocrine disrupting chemicals (EDCs) are hormonally active agents that interfere with the endocrine system. These are substances found in the environment, food, and personal care products.

3 How do EDCs affect my body?

Several classes of EDCs (listed below) can affect reproductive health by mimicking or blocking the effects of sex hormones.

4 What are some examples of EDCs in personal care products?

The most common EDCs used today are phthalates, polychlorinated biphenyls (PCBs), bisphenols, parabens, UV filters, and triclocarbans (TTCs).

5 How can I avoid EDCs?

Choose products labeled "Phthalate-Free," "BPA-Free," and "Paraben-Free." If possible, avoid fragrances and choose cosmetic products advertised as having "no synthetic fragrance."

6 What are bisphenols?

Bisphenol is a chemical produced primarily for the production of polycarbonate plastics and resins for consumer products.

7 What are parabens?

Parabens are chemicals that serve as antimicrobials and are used as preservatives in cosmetic products, such as feminine care products.

8 Whatare phthalates?

Phthalates are chemicals known as plasticizers due to their ability to make plastics more flexible; they are often used as humectants, emollients, or skin penetration enhancers in personal care products.

9 What are triclocarbans?

Triclocarbans (TTCs) are antibacterial chemicals often used in feminine care products including bar soaps, cleansing lotions, wipes, and bactericidal creams and solutions.

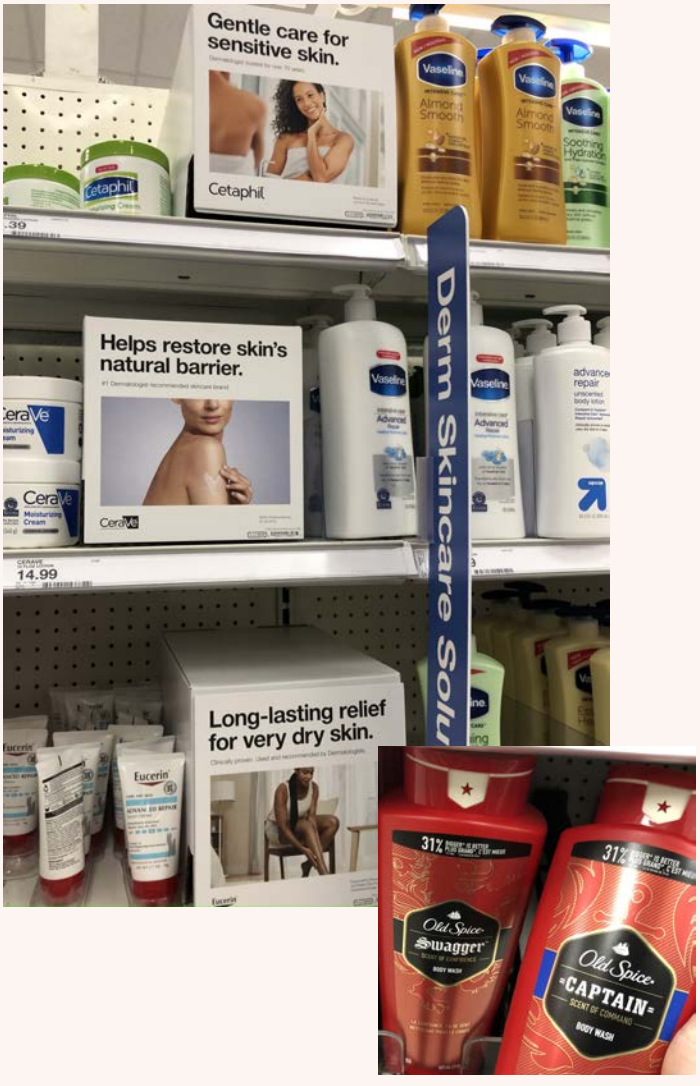
Definitions and research for this article were retrieved from the official website of the United States Environmental Protection Agency and the National Institute of Environmental Health Sciences.

BEAUTY STANDARDS TO BEAUTY HAZARDS

by alyssa s. moreno

A trip to the store serves as an escape from the regular hum of life, and I might even get a new product or snack out of it! This stimulating experience gives shoppers quite the thrill but the bright colors, the variety of choices, and the enticing choice of words are actually carefully crafted by highly researched marketing teams and deeply ingrained beauty standards and expectations. Let's take a trip through the personal care product aisles and dissect how these expectations permeate existence as a woman.

Walking through the store aisles, I noticed that most of the advertisements for soaps, shampoos, conditioners, and beauty products were all marketed toward women, portraying the ideal carefree and beautiful image of women. Even when the products themselves may not specifically mention women, the surrounding advertisements are only of women. The body soap aisle was split into a section of fruity and flowery soaps with bright colors and pictures of women, and a smaller offshoot section of products that said "men's." These products boasted cleanliness and freshness as their scents, even "swagger" and "captain," but products that weren't specifically male favored delicate, fruity, and pure messaging to describe their scent.



This isn't just a recent development either, as smoothness and appealing fragrance can be seen as desirable traits in this 1950's Pears soap advertisement below. This ad in particular teaches women that they must be a smooth, delicate, glowing creature their whole lives, even enforcing this beauty standard on babies. Even a baby needs to fit a certain description to be seen as desirable and is labeled as beautiful in the same way a grown woman might be. A woman's worth seems to be determined from birth to old age, all with the ultimate goal of being desirable to men and being married off. Why does there need to be fragrance in this product then? In a later article, we discuss odor discrimination[1], and the expectation that women should be fresh and flowery smelling in order to be considered beautiful.

[5] The Australian Women's Weekly, August 19, 1950, p. 48

AD TEXT:
Babies Have It: She's taken her first steps to beauty already — just look at that clear, smooth Pears skin ! No ordinary soap is so mild, so kind to a baby-fine skin so gentle, pure Pears !

Grandma Has It: How they love to kiss Grandma's soft cheek — satin-smooth from a lifetime of Pears ! From when Grandma was the belle of the ball — as today — lovely women used Pears, the traditional soap.

Brides Have It: On that day of all days — that inward glow of a radiant heart, the outward glow of clear, smooth skin — a skin kept naturally lovely with pure Pears soap.

YOU Can Have It, Too! : See how quickly your own skin responds to Pears' delicate care ! Hold a Pears tablet up to the light — it's so pure you can look right into its amber heart. Smell the mildness you cannot mistake . . . feel the silky awakening caress of the gentlest of soaps.

This isn't just a recent development either, as smoothness and appealing fragrance can be seen as desirable traits in this 1950's Pears soap above. This ad in particular teaches women that they must be a smooth, delicate, glowing creature their whole lives, even enforcing this beauty standard on babies. Even a baby needs to fit a certain description to be seen as desirable and is labeled as beautiful in the same way a grown woman might be. A woman's worth seems to be determined from birth to old age, all with the ultimate goal of being desirable to men and being married off.

As a mensturating person, I visit the feminine hygiene product aisle from time to time, but never really think about what these products contain. Pads and tampons, as we discuss later on may contain phthalates, parabens, bisphenols, and triclocarban (TTC) that act as EDCs to our most vulnerable parts. However, menstruating people have to use these products for long periods of time, and often they are the only accessible choices. These products are all colorful and some have flower print designs and added fragrance, which also risks contact with another EDC, diethyl phthalate (DEP).

Close to the pads and tampons are other feminine hygiene products like wipes and vaginal cleansers from brands such as Summer's Eve and Vagisil. There is also added fragrance in many of these products. Fragrance in menstrual and vaginal cleansing products is tied to ideas of sexual purity and enforced shame about menstrual health[1]. Women are subjected to shame about their own bodies and feel the need to mask or hide odors that aren't even there. There are also connections to myths about sexual promiscuity and subsequent social shaming[2] that pressure women into masking their bodies with fragrance or cleansing their bodies with any number of personal care products.

Products like lotions, sunscreens, makeup, and nail polish all feature advertisements and messaging that promote beauty standards as well. Women must use lotions that make them smooth and fragrant, makeup that paints them pure and free of blemishes, and nail polish that garnishes their hands, which have been preferably also made appealing to hold, as we see in this 1940's Jergens lotion advertisement.

Women even need to have soft delicate hands to be desirable. The expectation to be gentle, kind, and soft can be traced to women's perceived role as a subservient, passive, delicate creature at the hands of men[3]. These harmful images constantly portrayed in media and in advertisements constantly compel women to use personal care products to fit that ideal description.

6 McCalls, February 1949, Jergens ad

AD TEXT:
"M'lady, a token," Tom teased. Then he bowed low and kissed my hand right in the middle of Piccadilly Circus! I thanked Jergens Lotion a thousand times for keeping my hands as smooth ... 'cause I know Tom noticed them ...

When we went to the Tower of London, Tom held my hands so tightly. "These soft, little hands are more precious than the Crown Jewels!" he said.

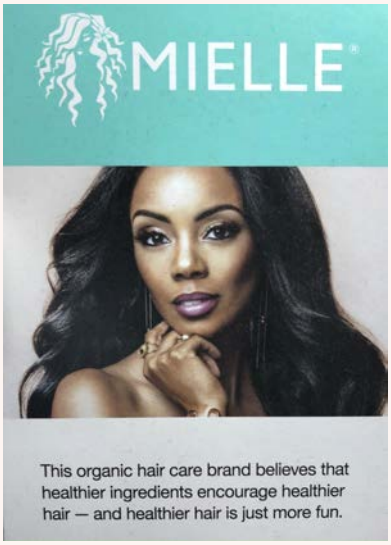
Later that evening we watched the Thames glide by Westminster Bridge. "You hold my heart in your sweet, adorable hands ... forever." Tom whispered. And as we kissed ... I knew it would be forever for us.

It's fun being Mrs. Tom! Tome buys my Jergens Lotion now! After all, it started this handkissing.

Kissable hands are softened, smoothed ... protected with today's super-creamed Jergens Lotion. Actually two ways [sic], it protects your hands longer; keeps them softer and smoother. Being a liquid, Jergens Lotion quickly furnishes the softening moisture thirsty skin needs. Doctors rely on two special ingredients for skin softening. Your Jergens Lotion contains both!

Hollywood Stars use Jergens 7 to 1 to keep their hands soft and ever young. Keep your hands lovelier the way the Stars do. Still only 10 cents to $1.00 (plus tax). Never oily or sticky.

Now yours — Jergens Beauty Kit! Contains generous samples of Jergens Lotion, Powder, Face Cream and Dryed Deodorant! Send 10 cents to The Andrew Jergens Co., Box 6, Dept. 45A, Cincinnati 14, Ohio. Sorry, offer good in U.S.A. only, expires Dec. 31, 1949.

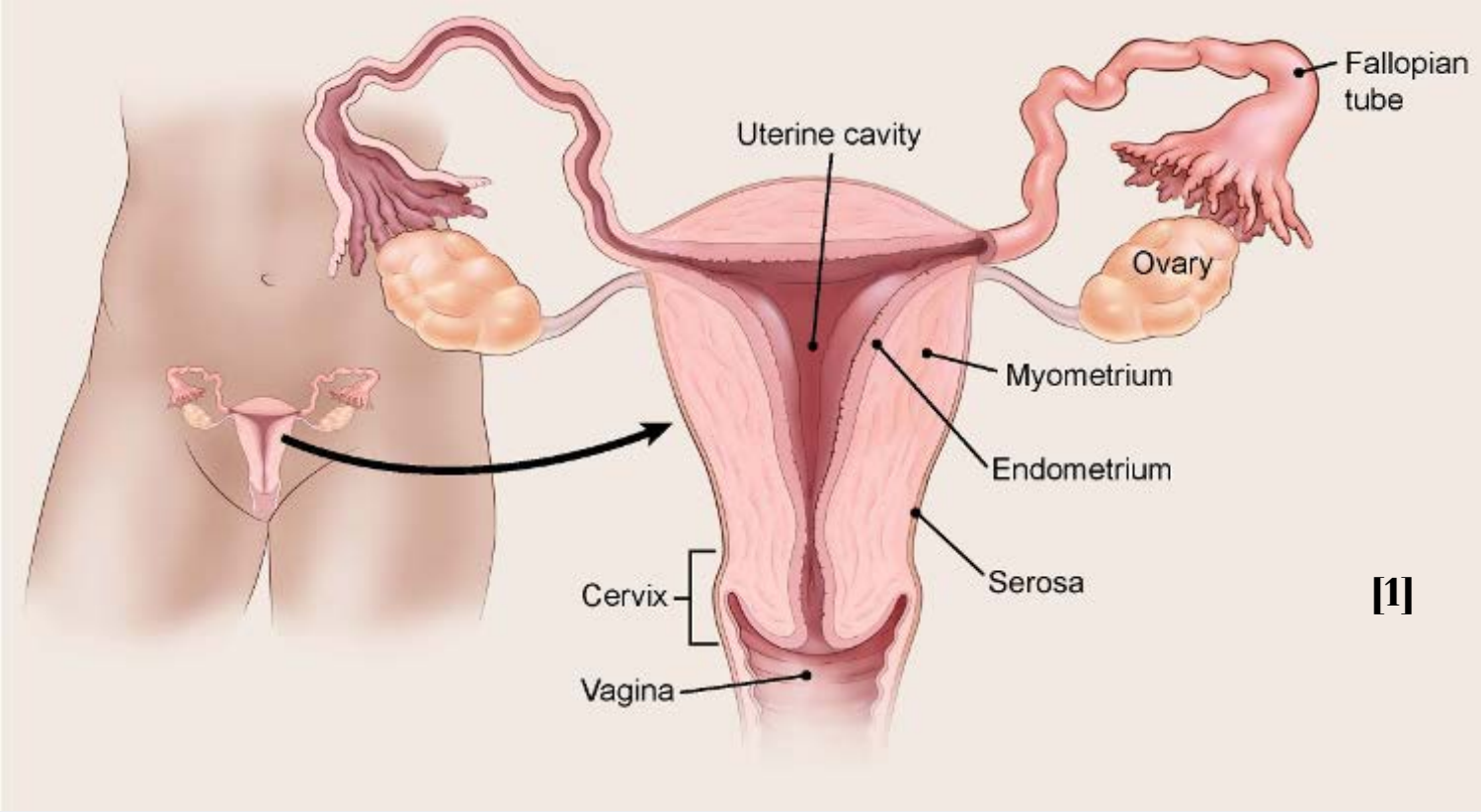


An added dimension to the already strict beauty standards that plague women is expectations for women of color. Lighter skin and straighter hair are beauty standards that women of color must subscribe to to be more palatable for the workplace and in their everyday lives. These standards are also upheld by other women, as white women have been found to rate Black women's textured hair as less beautiful and attractive than less textured hair[4]. This causes Black women to feel twice as much pressure to straighten their hair when they go to work than white women which means twice as much exposure to EDCs.[4] Products in the United States also may not disclose certain ingredients, so this all poses a huge health risk for women of color in particular.

Ruffa Gutierez for MET whitening soap, September 23, 2007 [6]

The beauty aisle is filled with ideal images of what a woman should be, and offers solutions to our insecurities in the myriad of products all focused on making a woman desirable. It is no wonder then, that women are drawn to use more personal care products and are therefore exposed to more EDCs. What is confusing then, is why these products still contain these harmful ingredients. Why is it that maintaining women's outward appearance is more of a priority than maintaining her health?

An Anatomical Look: The Female Reproductive System



[1]

The above diagram illustrates the anatomy of the female reproductive system. Many articles in this magazine reference organs included in this system.

“

...THE BILL OF RIGHTS CONTAINS NO GUARANTEE THAT A CITIZEN SHALL BE SECURE AGAINST LETHAL POISONS DISTRIBUTED EITHER BY PRIVATE INDIVIDUALS OR BY PUBLIC OFFICIALS...

”

RACHEL CARSON, *SILENT SPRING*

LEGISLATIVE ACTION

Fiona Griffin

Photo: "law scroll"
By: DAPA images
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What action did the United States government take in response to this growing concern? Where does responsibility lie?

Here we examine and transpose EDCs to a legislative context. After understanding the disastrous effects of the prevalence of EDCs in everything from personal care products to birth control, the United States Congress began legislative policies in attempts to identify, mitigate, and prevent EDCs from harming the public. Before 1995, no governmental regulation involving EDCs in the environment or manufactured products existed. As a result, there was no accepted approach to study, investigate, nor create protective regulatory policies. No action was taken, and cases of reproductive cancers (breast, prostate, etc) increased while research stagnated [1].

However, in 1995 the National Science and Technology Council (NSTC) committed to addressing the piling corroborations of harmful reproductive effects due to increasing public concern. Active since 1993, NSTC assists in coordinating and directing research initiatives for various governing bodies of the executive branch of the U.S. government. The NSTC is the chief council of the executive branch overseeing government funding and directed research. In 1995, the NSTC commissioned the Environmental Protection Agency (EPA) to start assessment of the lasting health consequences due to unidentified environmental EDCS and exposure rates [2] .

How did the EPA attempt to tackle this challenge?

At the 1995 council, groups from academia, industry, government and public interest groups, with differing knowledge backgrounds of epidemiology, ecology, risk assessment, exposure assessment and human toxicology gathered to embark on an initial interdisciplinary approach to the problem.The groups believed that methods, results and "sound scientific information must be the basis of good decision making" [3]. A detailed report was published to address priority concerns, methodology recommendations, and future directions of research [2].

How did the EPA workshop shape future legislation?

The next year, the Food Quality and Protection Act (FQPA) was passed by Congress, establishing a consistent and overarching statute. This act made amendments to the Federal Food, Drug and Cosmetic Act of 1938 (FFDCA) the Federal Insecticide, Fungicide, and Rodenticide Act of 1910 (FIFRA). These updates required the EPA to vehemently change the manner in which they monitored and regulated the safety of chemicals in pesticides, cosmetics, and more. It mandated protections for children, health-based standards for all food, acceleration of authorization for more safe pesticides and farming protection, and recurring assessments of chemical tolerances [4].

What is the Federal Food, Drug and Cosmetic Act of 1938 (FFDCA)?

The FFDCA is the nation's longstanding law that establishes safety and quality standards drugs, food, cosmetic products, personal care products and more. It is enforced by the Food and Drug Administration (FDA), the agency that monitors medications, food, supplements, cosmetics and more to safeguard public health [5].

LEGISLATIVE ACTION

The following seven years consisted of government-funded research and development for EDC screening procedures, testing methods, and the creation of a list of chemicals elected for EDC screening.

In 2009, the EPA submitted a draft of policies and procedures for the initial screening of chemicals under the Endocrine Disruptor Screening Program (EDSP), a program established by the EPA to screen chemicals in a reviewed, scientifically sound and universal manner to "determine if certain substances had hormonal effects." Yet, the draft and its subsequent updates did not focus on personal care products, manufacturers of cosmetics nor feminine care products. Instead, it focused solely on chemicals in pesticides, and only in 2014 did it begin screening drinking water for EDCs [6]

The next year the EPA finalized its testing guidelines for EDCs in pesticides and drinking water.

It is evident that the EPA made concerted efforts to protect the public health of the United States from EDCs in pesticides. However, due to their lack of prompt action before 1995, only EDCs in pesticides have been sufficiently regulated [6].

1995 — **EPA EDC Research Workshop**

1996 — **Food Quality Protection Act created**

1999 — **EPA committee reviews environmental EDC list**

2000 — **First Progress Report published**

2001 — **First Testing Methods Published**

2009 — **Final List of Chemicals submitted for screening**

2010 — **EPA publishes EDSP draft for section 408(p) of the FFCDA and Safe Drinking Water Act**

2015 — **Management Plan established and finalized**

There has been little to no focus on the prevalence, effects, nor regulations of EDCs in personal care products, even though the average American woman exposes themselves to 168 chemicals daily [7]. Much more action must be taken in the direction of EDC regulation of personal care products in order to effectively protect the public health of people from exposure to EDCs.

What is the Federal Insecticide, Fungicide, and Rodenticide Act of 1910 (FIFRA)?

As stated by the EPA, the act is the "Federal statute that governs the registration, distribution, sale, and use of pesticides in the United States" [8].

LEGISLATIVE ACTION

Opposite the editorial page

Were there ulterior motives to beginning the 1995 EPA workshop?

Interestingly enough, the reviews of the initial convention use tentative and cautionary language. In a report of the U.S. EPA-sponsored workshop published by Dr. Robert Kavlock, the acting assistant administrator of the EPA in 1996, described the growing body of evidence of EDC-caused health ailments, "a hypothesis...put forward...". He describes the workshop as a concerted effort to "identify research gaps related to this hypothesis" [2]. Unfortunately, sparse information is available as to whether or not Kavlock and the EPA received public pressure to initiate this workshop. Yet the exculpatory vernacular of the report seems to avoid any sort of recognition of the EPA's lack of action previous to the convention.

Logo obtained from EPA.org

Looking Forward

Today, the EPA collaborates with the National Institute of Environmental Health Sciences (NIEHS) Children's Environmental Health and Disease Prevention Research Centers to continue research on early life exposures and lifetime health, reproductive effects, and effects on Neurological Development.

It commits to research efforts including detecting EDCs in animal feed, evaluation of EDCs in sewage, and assessing EDCs in landfills, wastewater and solid waste sites.

As the United States furthers its research into the harmful effects of EDCs on endocrine health, it should look to other nations that have had previous success regulating the use of toxic chemicals in personal care products [9].

The Environmental Protection Agency was founded in 1970 and proposed by Richard Nixon. Fourteen presidential-appointed administrators head the agency (EPA.org, 2020)

Photo: "court house"
By: DAPA images
Free Licensing by Canva Pro

Background Image
"Natural skincare cosmetics from above"
By: JulyProkopiv
From: Getty Images Pro
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A BRIEF VIEW OF THE PERSONAL CARE PROTECTION ACT

ARTICLE BY LEAH THOMAS

Why do we see many chemicals banned in the United Kingdom, Canada, and many other countries, but not in the United States? What sort of regulation (or lack thereof) does the United States have? The Food and Drug Administration of the United States (FDA) has not seen any type of oversight in over 80 years (1). Despite the inadequacies previously seen in regulatory legislation, a new bill is the first glimpse of change in the industry. In 2019, U.S. Senators Diane Feinstein and Susan Collins introduced the Personal Care Products Safety Act to strengthen regulation of certain chemicals currently being used in beauty and personal products (1). The Personal Safety Products Act will provide the Food and Drug Administration (FDA) of the United States the authority to protect consumers from what they categorize as harmful chemicals (2).

According to the Personal Care and Products Safety Act, the FDA would have the authority to recall products that threaten the safety of consumers and enforce labeling and transparency of certain products (1). Additionally, manufacturers would have to register annually to the FDA new data about their products and must include contact information on their sites about ways to report any serious effects their products have caused to their consumers (1). These, along with many other safety regulations set forth by the FDA, would provide greater oversight to the industry in the manufacturing of beauty, skincare, and other personal products before it makes it on the shelf for consumer use.

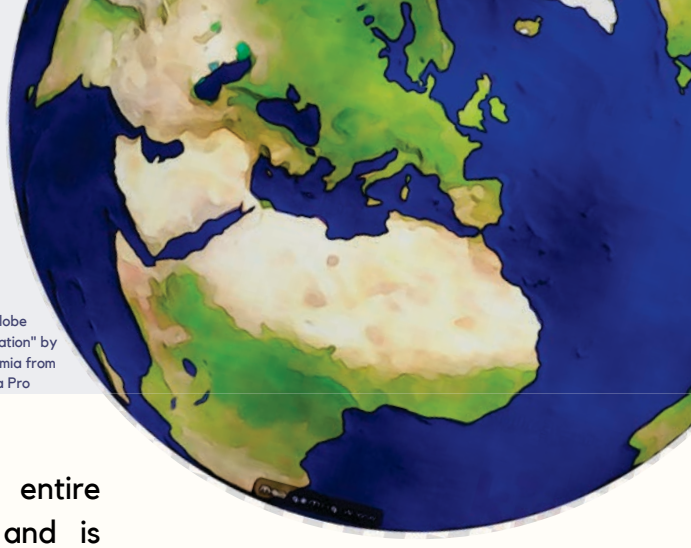
> "The Food and Drug Administration shall require labeling of cosmetics that are not appropriate for use in the entire population" (2)

Some of the most concerning chemicals listed on the bill that currently are legally allowed in U.S. products include Diazolidinyl urea, Diethyl phthalate,Methylene, glycol/formaldehyde, Propylparaben, and Quaternium-15 (1). These ingredients have been listed in shampoos, hair straightening products, skin creams, and cleansers. Many of these chemicals are considered endocrine disruptors that mimic estrogen, a naturally occurring hormone in the human body, leading to a variety of issues including genital bleeding, premature breast development, uterus enlargement, menopausal symptoms, and breast cancer (3).

What does this mean as an American consumer? With this act, companies and organizations bear the responsibility of providing safe ingredients in their products, rather than relying on consumer education and knowledge about what products are of concern for their health. No longer would consumers have to depend on the bottle that claims to be "organic" and "good for the environment and good for you" as labels to what they decide their standards of care should be. It also ensures the safety of the United States population by providing a standard procedure for the management of personal care products as do other countries around the world. It would provide a higher standard to the types of products that make it to market and that make it into the homes of American individuals.

A GLOBAL PERSPECTIVE

BY LINDSEY SNETSINGER



"3D Globe Illustration" by welcomia from Canva Pro

Consumers worldwide are presented with a false sense of security about the safety of their personal care and cosmetic products, and many consumers fall for the ambiguous labeling of "safe" and "non-toxic" products. If it is approved by their country to be sold on the market, how harmful can the product really be? The answer might not be so simple, especially when viewed through a global lens. The definition of the words "safe" and "non-toxic" varies between countries, and standards for being labeled as such are not internationally consistent. The approach to regulation of chemicals in personal care products and cosmetics varies greatly between the world's largest producers and consumers of these products, including the United States and the European Union. The European Union, which proves to have the most effective overall regulatory approach, regulates chemical substances used in personal care and cosmetics products through a program called REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals).

REACH oversees the entire chemical supply chain and is intended to protect the health of both humans and the environment by working closely with the European chemicals industry. REACH mandates that all chemical candidates undergo a risk-assessment trial before approving them for use, and conducts ongoing or retrospective analyses for existing chemicals [1]. Any company wanting to use a certain chemical must receive approval from the European Chemicals Agency's (ECHA) scientific committee and provide proof of proper use before production [2]. The scientific committee also has the authority to ban chemical substances before or after hazards present. Most importantly, the European Union also mandates that industry participants disclose all health information about their products to consumers, including potential hazards and proper handling of the product [2]. The ECHA's online website makes it very clear that each sector of the chemical supply chain must recognize their responsibility and comply with standards, including both large manufacturers and small businesses. Though the tight regulation of REACH may provide a good amount of protection to residents of the European Union, the globalization of personal care products has limited safety to the legislation of other countries. Companies outside of the EU are not required to comply with REACH standards, even if their products are imported into EU countries [2]. This policy presents a great risk to European consumers, as regulation in the United States, the second largest producer of personal care products and cosmetics, has a much more complicated and less effective approach to regulation. The United States involves multiple stakeholders in its regulation of chemicals, and no one organization has the ability to approve or terminally revoke the use of a substance. According to the United States Food and Drug Administration (FDA), which is a federal agency intending to protect public health, the only

ingredient that requires FDA approval in cosmetic products is color additives. Companies can therefore use any other ingredient as long as the substance is not adulterated and the packaging properly labels the product's intended use. The FDA also states that the responsibility of ensuring safe ingredients is up to the companies themselves, and there are no required risk-assessment trials for chemicals they use. Companies can use research on the toxicological properties of their ingredients that have been previously conducted, but the FDA does not require companies to report this information back to the FDA or to their consumers. Unlike the European Union, the FDA also does not require companies to register their use of chemical substances, and if a certain ingredient is found to threaten consumer health, the recall of that product is voluntary for the company [3]. Though intentions to protect humans and the environment are much more clear in the European Union, the United States does involve the Environmental Protection Agency (EPA) in chemical regulation. Under The Toxic Substances Control Act of 1976 (TSCA), the EPA can indirectly prevent toxic chemicals from being used in personal care and cosmetics products. However, the EPA must provide significant evidence that a chemical puts forth an excessive threat to consumers in order for its use to be restricted [4]. Since the FDA does not require companies to perform or publish research on the hazards of their ingredients, the EPA often lacks enough information to prove any potential harm. Though the European Union proves to be far ahead in the fight to ban toxic substances, importation of US products greatly hinders their immunity against harmful chemicals. The absence of effort to unify and maintain chemical regulation across borders therefore threatens individual health regardless of residency. Consumers should not be left wondering why their product is banned in another country, and choosing products free of toxic substances should not be an individual responsibility.

"Cosmetics Bottle" by
Billion Photos from Canva Pro

A COMPARISON OF NATIONS

BY: LEAH THOMAS

Below is a comparison between the safety regulation of chemicals in different administrations. In the visual, the European Union is seen to have an extensive list of thousands of chemicals that have been banned by the European Parliament and the Council (2). In contrast, the Food and Drug Administration of the United States has only prohibited/restricted the use of 11 chemicals in American cosmetics products. (1). Why do we see a set of nations regulate the use of certain chemicals so heavily while the United States fails to do so? Research studies that warn against the health effects that certain ingredients in personal care products pose are controlled in the E.U., and we must analyze whether the United States should also uphold similar standards.

Chemicals Banned in the U.S. (1)

Bithionol
Chlorofluorocarbon propellants
Chloroform
Halogenated salicylanilides (di-, tri-, metabromsalan and tetrachlorosalicylanilide)
Hexachlorophene
Mercury compounds
Methylene chloride
Prohibited cattle materials
Sunscreens in cosmetics (explicit labeling must be used)
Vinyl chloride
Zirconium-containing complexes

Chemicals Banned in the E.U. (2)

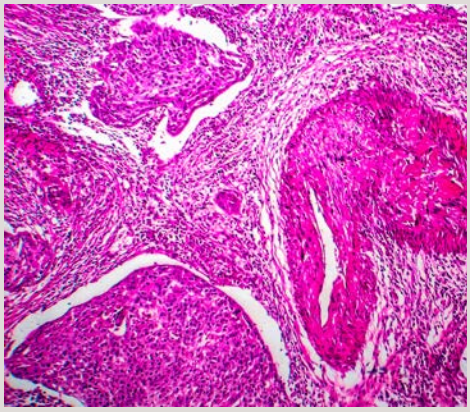
Carbutamide
Phenylbutazone
Cadmium and its compounds
Catharides, Cantharis vesicatoria
(1R,2S)-Hexahydro-1,2-dimethyl-3,6-epoxyphthalic anhydride (cantharidin)
Phenprobamate
Carbon disulphide
Catalase
Cephaeline and its salts
Chenopodium ambrosioides (essential oil)
2,2,2-Trichloroethane-1,1-diol
Chlorine
Chlorpropamide
M3 Diphenoxylate hydrochloride
Chlorzoxazone
2-Chloro-6-methylpyrimidin-4-yldimethylamine (crimidine-ISO)
Chlorprothixene and its salts
Clofenamide
Diethyl 4-nitrophenyl phosphate
Metethoheptazine and its salts
Oxpheneridine and its salts
Ethoheptazine and its salts
Metheptazine and its salts
Methylphenidate and its salts
and over 1,200 more...

Public health is an interdisciplinary endeavor requiring scientific, political, and social knowledge. To protect public health, the distribution of chemicals in the environment must be regulated by legislation that is based on valid methodology and objective research findings. Therefore, excellent scientific research must demonstrate the ill effects of endocrine disrupting chemicals to legislative authorities. The following articles analyze various substances used in personal care products that threaten female reproductive health. The evidence of any negative health outcome or associated risk should be enough to implement regulation of that substance, despite variation within the research.

BPA

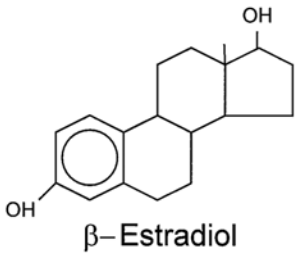
Bisphenol-A: A Review of Plastic Toxins and Female Infertility

by Lindsey Snetsinger

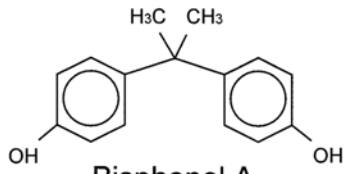


"Squamous Cell carcinoma of the Uterus, light micrograph" by Dr_Microbe from Getty Images on Canva Pro

The name "BPA" may seem oddly familiar to customers who purchase just about anything made of plastic. Specifically, the phrase "BPA-free" may elicit a peculiar feeling of safety, and the tender memory of choosing a water bottle simply because it was labeled with that phrase. Though consumers may not be well-versed in scientific literature regarding why "BPA-free" is a better choice, the uncertainty portrayed by this phrase indicates that BPA is a threat to their health- a philosophy that the plastics industry just can't quite grasp. Bisphenol-A (BPA) is a synthetic chemical compound used to increase the flexibility of plastics. It has gained immense popularity between economists and the plastics industry since its introduction in the 1950s, including manufacturers of personal care products and cosmetics. However, this cheap and easily produced chemical presents confusing ideas to the lay public about its safety. Unsurprisingly, classifications of BPA's toxicity differed tremendously across the globe, and major discrepancies persisted regarding what defined a "safe dose" of the chemical. The overtly attractive dose-response relationship- a model that assumes the outcomes of a chemical exposure intensify with each increasing dose- distracted researchers away from the fact that low-dose exposures to BPA can actually pose a greater threat than large-scale exposures [1]. Unfortunately, low dose exposures are probably even more representative of the actual dose humans experience in their daily routines due to relatively small amounts being used in the packaging of personal care products. BPA is pervasive in the everyday environment of humans because it can leech out of plastic packaging into products that are directly applied to the skin. BPA is mass produced in the packaging of personal



β–Estradiol



Bisphenol A [10]

care products and cosmetics such as shampoos, conditioners, and lotions, and more than 5 million tons of BPA are produced annually [2]. A common mechanism of exposure to BPA is through dermal absorption, making the presence of BPA in the packaging of topical products particularly concerning [3]. Furthermore, BPA has recently been identified as an endocrine disruptor associated with female infertility, and has been shown to interact with various stages of the female reproductive cycle. Though the true etiology of female infertility involves multiple contributing factors, recent studies have identified a stronger

"Plastic granules- Polyethylene pellets and hands with gloves. Quality control of plastic in the laboratory in production. BPA FREE" by Stas_V from Getty Images on Canva Pro

"Ovarian follicles. Light micrograph of a section through secondary follicles in an ovary" by Science Photo Library on Canva Pro

relationship between infertility and environmental or lifestyle components compared to biological causes. Individual genetics can, of course, play an important role in any medical condition, but it is unlikely that the recent widespread prevalence of female infertility is due to genome-wide changes [3]. Therefore, researchers have looked into factors that did not have the ability to affect past generations as novel sources for infertility, such as the extensive use of synthetic chemicals and plastics like BPA. BPA is not only prevalent in the environment, but also within the human body. Trace amounts of BPA can be easily detected in urine, breast milk, blood, and ovarian follicular fluid [2]. Despite its rather short half life, BPA maintains this high level of ubiquity within the body because it can accumulate in reproductive tissues and resist excretion. Upon accumulation, BPA functions as an endocrine disruptor by mimicking the chemical structure of the hormone estrogen, which is responsible for female maturation and reproductive development [3]. Estrogen levels in the female reproductive system exist in delicate ratios and require heightened specificity during critical stages of development, from in-utero growth to child-bearing years [4]. Thus, any disturbance to this ratio can induce premature or delayed maturation of reproductive organs, such as the uterus, therefore promoting infertility. Recent epidemiological studies conducted using serum samples (a derivative of coagulated blood [5]) found BPA levels to be higher in samples from infertile women compared to fertile women [6], and higher in women with polycystic ovarian syndrome (PCOS) compared to women without PCOS [7]. Though further research is required to determine ultimate causality, associations between BPA serum levels and reproductive difficulties are not trivial. Recent technologies such as in vitro fertilization have been developed to combat infertility, and BPA may also be hindering the success of these interventions. In one study, researchers identified an inverse correlation between serum BPA levels and success rates for in vitro fertilization. Their data suggested that the number and quality

"Chemistry Flask" by StudioG on Canva Pro

"BY NOW, TESTS HAVE FOUND [BPA] IN MORE THAN 90% OF AMERICANS" [9]

of oocytes, the female germ cell, retrieved during IVF treatment decreased as serum levels of BPA increased [6]. Additionally, another study found that BPA can be detected in human follicular fluid, which indicates that an oocyte is exposed to BPA even before fertilization even occurs [8]. Researchers from both studies were unable to determine the exact mechanism or molecular explanation for the decreased success of IVF treatment, but both concluded that the associations involving BPA in human serum should not be ignored. Though inconsistencies in human data remain in regards to how and to what degree BPA can contribute to female infertility, a collection of mice studies have also demonstrated strong evidence of reproductive interference. Specifically, researchers found that low-dose exposure to BPA during the pre-implantation stage of pregnancy results in smaller litter sizes, and the inhibitory effects of low-dose exposure after implantation persist through successive generations of mice [6]. Although it is worthy to note that animal studies may not be perfectly representative of human reproductive organs or doses of BPA exposure, the results of these studies provide researchers new areas to focus their investigation. The infinite and overwhelming use of plastics in the modern world should not be mistaken as harmless. The sheer fact of finding detectable levels of BPA in bodily fluids, especially those so crucial to nurturing future generations, should be enough to ban the production of this chemical and its use in products that are used to cleanse and beautify the body. The refusal of legislative authorities to recognize harmful effects and restrict the use of toxic chemicals like BPA has put women of the 21st century at a reproductive disadvantage. Until the negative effects of BPA on reproduction can be strongly disproved, exposure to BPA should be closely monitored by females of all biological maturity levels. Though choosing "BPA-free" products may feel like a surrender to the new wave of "non-toxic" advertising ploys, doing so may determine the future of the human population.

Are Your Pads Really Protecting You?

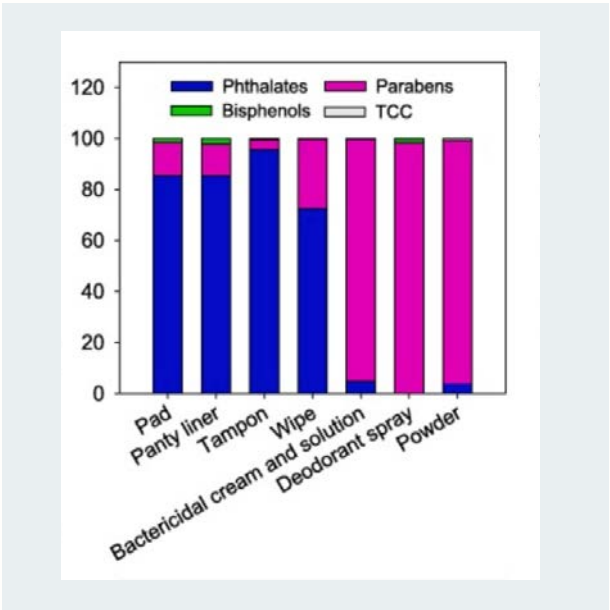
BY JOUSSIE CAMACHO

Feminine hygiene products such as pads, panty liners, tampons, wipes, bactericidal creams and solutions, deodorant sprays, and powders that are meant to protect women may actually be a direct source of exposure to endocrine disrupting chemicals. Parabens, phthalates, bisphenols, and triclocarban (TTC) have been found in relatively high concentrations in all categories of feminine products listed above. What's most concerning is that even though exposure to such chemicals has been linked to adverse effects for women's reproductive and vaginal health, there are no standards or regulations to limit their use in feminine hygiene products [1]. Because pads and tampons are considered to be "medical devices," manufacturers of femine care products are not obligated to disclose the ingredients they use. As such, most consumers are unaware of the chemicals found in the products they use on a monthly or even daily basis. Given that a majority of the female population uses pads (62-73%) and tampons (50-86%), these women are at a disproportionately high risk of exposure to EDCs [2]. The close proximity of these products to reproductive organs brings forth reason to believe that such exposure can have negative effects on a woman's reproductive system, warranting further research. One study (the first of its kind in the US, but hopefully not the last) measured the exposure doses of such chemicals via dermal absorption. While it is well known that many personal care products are a common source of EDC exposure, this study found that the exposure specifically from feminine hygiene products is much more significant than exposure from other sources. This is because these products come in direct contact with reproductive organs including vulvar skin and vaginal mucosa. Exposure not only occurs during a woman's menstrual period each month, but in many cases, throughout the entire reproductive period, resulting in prolonged and chronic exposure to toxic chemicals [1].

These reproductive organs contain some of the most sensitive and absorptive skin on the female body [3]. In fact, hormone treatments administered vaginally by doctors were found in the body at levels 10-18 times higher than when those same treatments were given orally [3]. Likewise, contaminants present in feminine hygiene products can be readily transferred from the vagina into the circulation. Researchers studying EDCs in feminine hygiene products have reported that exposure resulting from

menstrual products is at least 10 times higher than the absorption rates of products that come in contact with skin elsewhere [4]. The feminine products used during these long periods of time also tend to be highly absorbent and permeable, and while that may be useful for absorbing menstruated blood or other vaginal fluids, this characteristic can pose great threats to the entire female body. The EDCs found within such products can effectively flow through the bloodstream due to their hormone-like properties.

One study calculated the daily exposure doses of EDCs using values such as the measured concentration of phthalates, TTCs, parabens, and bisphenol in pads, panty liners, and tampons, the number of these products used daily (and average of 6 per day), the transdermal absorption rate, and the average body weight of women. The transdermal absorption rate of EDCs was measured in terms of how efficiently the vulvar skin (external female genitalia area) and the vaginal mucosa (the mucous membrane of the vagina) absorbed the toxic contents within female hygiene products.



Graph: % concentration of EDCs
Retrieved from : Source #1

However, the absorption and exposure rates calculated might not accurately represent real-world usage because women often use multiple hygiene products at the same time and because these products contain other potential EDCs that were not considered for this study [1]. This same study found that while phthalates made up the majority of the compounds detected in pads, panty liners, tampons, and wipes, parabens were the most prominent in bactericidal creams and solutions, deodorant sprays, and powders. Additionally, bisphenols and TTCs were also detected in every kind of product analyzed, but at lower concentrations [1]. The high concentration of phthalates in pads, panty liners, and tampons is likely due to polypropylene (PP) and polyethylene (PE) materials used in their production; these materials contain phthalates that increase the flexibility of the products [5]. Other sources of phthalates in pads and panty liners are the hot-melt adhesives used between their different layers as well at the fragrance ingredients commonly added to these products [4]. The low concentration of phthalates found in bactericidal creams and solutions, deodorant sprays, and powders on the other hand, can be explained by the plastic materials they are packaged in. Nonetheless, these daily necessities have all proven to be a source of exposure specific to women. Far too many feminine "hygiene" products that come in very close contact with women's reproductive systems contain detectable levels of various EDCs, proving to be far from hygienic for women's reproductive health.

SUNCARE OR SUN(SCARE)

BY LEAH THOMAS

Top Photo
"Women with Sunscreen""
By: DAPA Images
Licensing Free for Canva Pro

Understanding the effects of UV filters from chemical sunscreens on breast tissue and the possible generational consequences of the accumulation of these chemicals in female breast milk.

With the rate of skin cancers and melanoma on the rise among individuals, dermatologists have often recommended that any individual who is exposed to the sun to wear a form of sun protection at all times. This includes individuals who go out to the beach, people who are gardening outside, and even workers who spend much of their time near clear windows. The sun penetrates the Earth with two types of ultraviolet light (UVA and UVB rays) that can damage skin cells with uncontrollable cellular growth causing skin cancer [1]. Detection of skin cancer often happens with the appearance of a mole-like pigment that changes rapidly over time in size and color. Skin cancer can quickly become metastatic if not detected and treated early [2]. Many skin cancers take place on exposed areas of the body including arms and face. Therefore, it is not hard to see why there is a rise in the use of sunscreen filters. However, recent research has suggested that sunscreen filters used to protect against the harsh ultraviolet rays have been linked to leakage of these chemicals in breast milk and the increased risk of breast cancer. Therefore, the health of the female breasts is vulnerable to disease and there might be an unintended consequence of passing these chemicals on to a child if a mother is breastfeeding.

In a study about dermal exposures to endocrine-disrupting chemicals to human skin, UV filters were found to pose a serious threat to the health and safety of many individuals. Women and individuals who use cosmetics and skincare products at a daily rate are more at risk because of the greater exposure they have to these filters. The study found that about 85% of breast milk samples contained UV filters octyl-methoxycinnamate (OCT) and 4-MBC [3]. The researchers also found a positive correlation between the use of cosmetics with these UV filters and the measured concentration in milk samples, indicating that these products are causing this internal accumulation of chemicals in the body rather than environmental exposure [3].

This research is important to analyze because current mothers who are breastfeeding have not only put their own bodies in danger, but we also have yet to know the effects on

the breastfed baby. First and foremost, the detection of certain UV filters from cosmetics products provides a sun protection factor (SPF) that can concentrate the body in high amounts. This can be attributed to the fact that they cannot be broken down nor excreted by the body very easily [3].

Secondly, these chemicals are present in human breast milk and if a mother is feeding a child with this milk, these chemicals could be passed on to the baby and accumulate in its own body. Although it has not been thoroughly studied, breastmilk can transit certain antibodies, and perhaps also some blood-borne pathogens and infectious diseases [4]. Breastfeeding mothers are also cautioned away from certain prescription medications which can be present in breast milk if used and passed to the baby. Therefore, the generational effects of UV filters of high dosage amounts in breastmilk can pose an issue to a child.

Despite the fact that this study does not specifically state how the chemicals in the sunscreen can affect the female reproductive system, the ingredients in chemical sunscreens are considered general estrogen mimickers. According to Breastcancer.org, "exposure to chemical sunscreens" is considered a breast cancer risk factor [5]. This means that this organization recognizes that chemical sunscreen filters do prove to be a threat to female breast anatomy and the development of cancer. Specifically, Benzophenone-3, a chemical used in sunscreen is defined as a xenoestrogen, a substance that mimics estrogen

Above Photo
"Photo of Woman Wearing Pink Bikini"
By: Retha Ferguson
From: Pexels
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levels in the body [6]. High concentrations of xenoestrogens have been shown to stimulate carcinogenesis, proliferation of cancer, through DNA damage in health breast tissues [6]. But does this mean we should eliminate sunscreens from our routine all together?

Although this seems like a very great cause for concern, it is not recommended that individuals stop using sunscreens all together. We must realize that the types of sunscreen studied are categorized as chemical sunscreens. Chemical sunscreens work by absorbing UV rays into the skin and dissipating them as heat, whereas physical sunscreens work by deflecting UV rays away from the skin [7]. Physical sunscreen, therefore, works better than its chemical counterpart because it does not work as chemicals that need to fully penetrate into the skin barrier, but rather as a physical screen on top of the skin.

It is important not only for breastfeeding mothers, but anyone who can and should use sunscreen to read the ingredients that are providing the SPF in their personal care products and be cognizant of the types of UV filters that are on the market that can cause health issues.

THE TRUTH ABOUT PHTHALATES

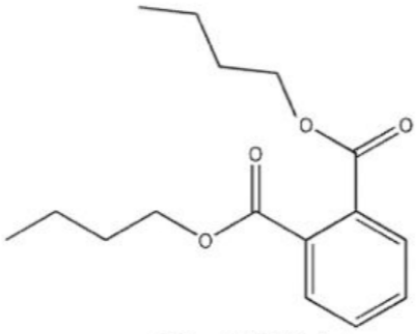
BY JOUSSIE CAMACHO

A common mechanism for human exposure to endocrine disrupting chemicals is through direct dermal contact with personal care products including lotion and perfume, to name a few. This means that your soothing lotion and exfoliating lavender body wash, while smelling delicious, are probably not worth the toll they can take on your body, especially when it comes to reproduction. Specifically, women are widely exposed to phthalates, a class of synthetic chemicals used to give plastic its flexibility. Dozens of phthalates have been developed over the years and continue to be widely produced despite findings that suggest direct impairment on reproductive health [1].

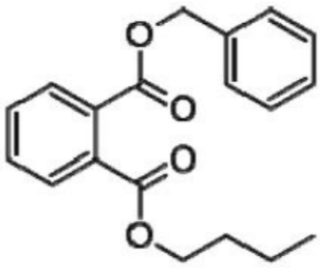
Studies have investigated the effects of specific endocrine disruptors on the hormone signaling system in normally menstruating women and mice. In both human and animal models, phthalates have been shown to negatively affect the female reproductive system, most notably by reducing fertility levels and decreasing pregnancy rates. One kind of phthalate known as di-n-butyl phthalate (DBP), poses a threat specifically to women of reproductive age, yet continues to be widely manufactured in cosmetic products. Other phthalates closely studied in regards to women's health are di-phthalate (DEHP), known to be the most potent reproductive toxicant, as well as n-butyl benzyl phthalate (BBP), which is also associated with complications in reproduction [1]. A systematic review of such studies evaluated the strength of the evidence regarding the effects of phthalates on reproduction, and found that DBP exposure was associated with decreased fetal weight and increased maternal weight in animal studies. Additionally, exposure to DEHP has proven to affect the actual structure of reproductive organs as shown by changes in ovulation, quality of oocytes (the immature egg cell), fertility, reproductive hormone concentrations, and pregnancy outcomes in adult mice and rats [2]. Furthermore, when rats were exposed to BBP during their pregnancy, not only did their food consumption and body weight decrease, but higher rates of deaths were observed in their fetuses. The fetuses that survived had lower birth weights along with external and internal malformations [2]. BBP can therefore affect both the mature and the developing reproductive system, as proven by the harmful effects observed in adult rats and their fetuses. Based on the outcomes of these studies, BBP has been classified as both a reproductive and a developmental toxicant [2].

"PHTHALATES HAVE BEEN SHOWN TO REDUCE FERTILITY & DECREASE PREGNANCY RATES"

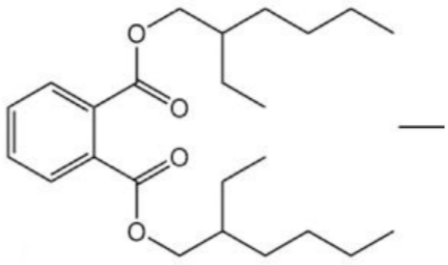
Image retrieved from source #2 in bibliography.



Dibutyl Phthalate
(DBP)



Butylbenzyl Phthalate
(BBP)

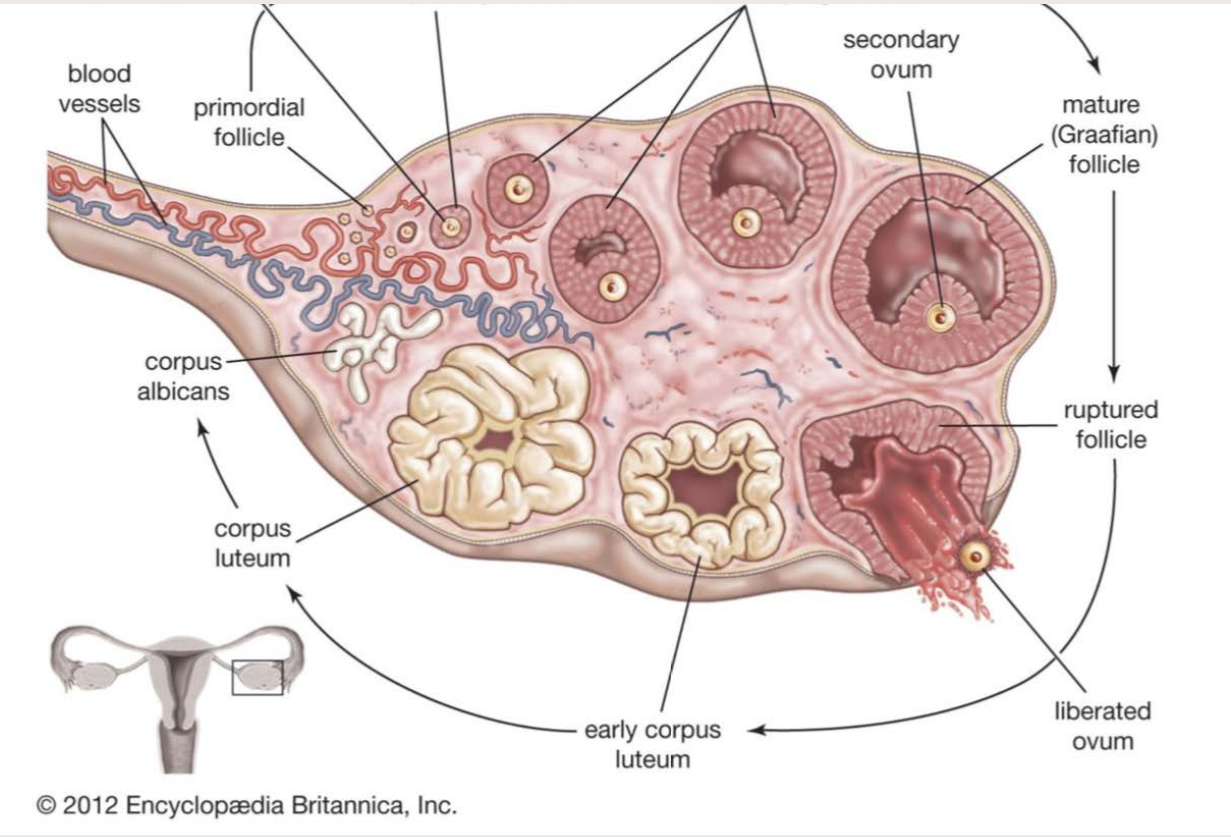


Di-2-ethylhexyl Phthalate
(DEHP)

This classification means that it can "adversely affect reproductive health in women or the reproductive capacity of experimental animals" [2]. Another study found that phthalates can directly affect human luteal cell function, which are the cells that make up the reproductive gland known as the corpus luteum. DBP, DEHP, and BBP were all found to have a direct inhibitory effect on cell function of the corpus luteum, which is essential for the establishment and maintenance of early pregnancy [1].In particular, exposure to DEHP was found to induce epithelial thinning, decrease corpus luteum function, and uterine degeneration in animal studies [2]. These findings have led researchers to believe that DEHP plays an important role in changing the actual morphology and structure of the female reproductive tract in humans. This information is alarming for those who wish to have children someday (or any of us with ovaries, I'd assume). Luteal cells in human ovaries are partially responsible for producing estrogen and progesterone hormones, both of which are significantly involved in pregnancy and reproduction [3]. In other words, these chemicals that are so easily shortened to a mere 3 or 4 insignificant letters can have enormous impacts on the female body.

The corpus luteum is heavily dependent on the hormones estrogen and progesterone. As such, it also contains alpha and beta estrogen receptors that would typically receive those hormones and carry out their appropriate functions. However, these functions can be inhibited by xenoestrogens, which are hormones that imitate the estrogens that would normally bind to the receptors.

Phthalates have been identified as xenoestrogens due to their ability to either look or act enough like hormones. These estrogen-like hormones then interfere with the typical receptor functioning of the body, causing a negative influence on the function of the corpus luteum cells. As a result, the corpus luteum begins to degenerate and affect pregnancy. Without a functioning corpus luteum to secrete estrogens and progesterone, the uterus will not be able to sustain the development of the embryo, and menstruation will occur [3]. Clearly, there is sufficient evidence to suggest that phthalate exposure negatively impacts reproduction and conception. Although these findings are largely based on animal studies, and research gaps still remain, the existing data is enough to conclude that phthalates are indeed reproductive toxicants. Many studies hesitate to make such conclusions because they argue that the levels of phthalates humans are exposed to is not enough to cause adverse effects on female reproduction. The argument is often that women in the general population are exposed to low enough concentrations of phthalates and therefore, significant harm cannot be observed. However, human exposure to phthalates is already so ubiquitous and there are no signs of decreased exposure in the near future (at least not in the U.S. where regulation is lacking). The potential of these chemicals to cause reproductive effects from high doses should be enough evidence to halt or limit the production of phthalates.The European Union has already banned DBP and DEHP for use in cosmetic and personal care products after being classified as "category 2 substances;" these are substances which are known to cause developmental impairment in humans or impair fertility [4]. Furthermore, Canada has banned all cosmetics that contain harmful substances, including DEHP. While these restrictions provide some hope, DEP is continuing to be used in cosmetics and personal care products around the world and other phthalates are only recently being phased out of production [4]. Still, there is a lot of legislative action left to take, especially in the United States.

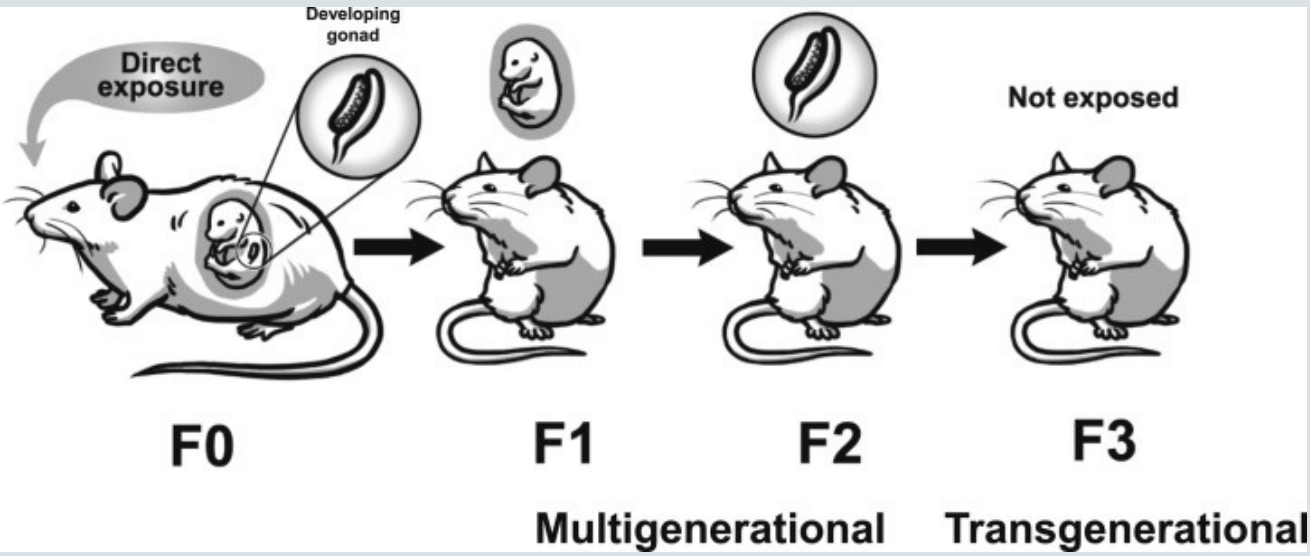


TRANSGENERATIONAL EFFECTS

by Lindsey Snetsinger

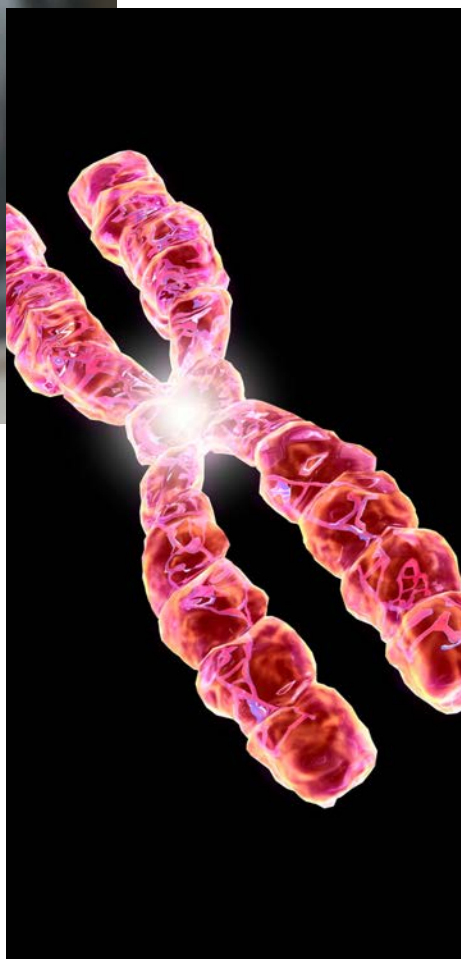
"Pregnant Woman holding Ultrasound on White Background" by PublicDomainPictures--14 on Canva Pro

An overwhelming amount of literature surrounds the importance of prenatal precautions for pregnant women; however, protecting the precious lives of our future generations must begin much earlier than we think. Recent studies have highlighted the ability of endocrine disrupting chemicals (EDCs) to permeate future generations even before conception, shifting the danger of EDC exposure away from the individual and onto ancestral populations. Prior to fertilization, our genetic identity begins within a germ-line that is carried by our grandmothers. Every chemical exposure our grandmothers experience therefore has the possibility of affecting us. Though we may not be familiar with a time where avoiding chemicals was not a treacherous feat, the ubiquity of toxic substances in our materialistic world has made it more important than ever to act with reproduction in mind. The relationship between early life exposure to EDCs and deteriorating reproductive health has recently been explored by the emerging field of epigenetics, which studies alterations to gene expression that can be passed on from parent to offspring. Unlike genetic mutations, epigenetic modifications are not the result of changes to the actual DNA sequence [1]. Essentially, epigenetic modifications can elicit a phenotypic change (the physical characteristics we see in an individual) without altering their genotype (the DNA sequence encoding that trait) [2]. Alterations to gene expression can result from histone modification and DNA methylation, two processes that can both be affected by exposure to endocrine disrupting chemicals [3]. Our entire genome is encoded by DNA molecules that are packaged into microscopic structures called chromosomes [4]. Within a chromosome, DNA is tightly coiled around histone proteins [4] that give rise to genomic stability [5]. A modification to histone proteins can therefore alter the structure



of the chromosome and influence the rate of transcription from DNA to RNA [6], the process that initiates protein synthesis and results in varied phenotypes [7]. Gene expression can also be influenced by DNA methylation, which occurs when an additional methyl group is added to a DNA molecule. This process results in transcriptional repression, which turns off the expression of certain genes and can similarly affect phenotypic characteristics [6]. Additional research of epigenetic modifications has brought forth evidence that the control of gene expression through DNA methylation and histone modification is not restricted to the individual, and can persist through subsequent generations. The above diagram [6] represents the generational effects of EDC exposure at different stages of development, and the difference between multi- and transgenerational effects. When the F0 female is exposed to an EDC, her daughter in the F1 generation is directly exposed to the chemical while developing in the uterus. At this point, the F2 generation is still a germ cell within the F1 daughter, and effects seen in either the F1 or F2 generation are termed multigenerational. Subsequently, the F3 generation did not experience direct exposure to the EDC at any developmental stage, so any observed effects are therefore termed transgenerational [6]. Members of the F3 generation can inherit phenotypic changes through the germline if an F0 female is exposed during gestation [8]. These transgenerational effects can be seen in mice populations with the chemical phthalates, an ingredient commonly used in personal care products and cosmetics such as perfumes and nail polishes. Phthalate exposure to an F0 generation of mice was found to induce accelerated reproductive aging in the F3 generation by decreasing the weight of their ovaries and interfering with normal sex hormone production. An imbalance of hormones caused the F3 generation to endure a longer period of diestrus (a stage of infertility), indicating that the mice prematurely arrived at the end of their reproductive time frame [6]. Further studies have also shown that ancestral exposure to phthalates can increase the

"Feeding Bottle on Table" by Burst on Canva Pro


"Chromosome" by Science Photo Library on Canva Pro

prevalence of Polycystic Ovarian Syndrome (PCOS) in subsequent generations of mice, which is currently the number one reproductive disease in human females. Though mice in the F1 generation who were directly exposed to phthalates in utero exhibited an increased prevalence of PCOS, the strongest outcomes were seen in the F3 generation, in which every single female developed the disease. Most significantly, no females in any of the control generations developed PCOS symptoms. Researchers were unable to determine the exact mechanism of epigenetic modification, but speculated that DNA methylation could have an associative role [8]. Findings from this study therefore support the hypothesis that reproductive diseases can be epigenetically inherited, and exposure to phthalates can result in major consequences even for generations that do not endure exposure. Furthermore, generational inheritance can be seen with Bisphenol-A (BPA), a plastic similarly used in the packaging of personal care products. One study found that BPA exposure in the F0 generation caused behavioral changes in the F1, F2, F3, and F4 generations, representing both muti- and transgenerational inheritance of the modifications. These findings were associated with abnormal expression of various genes that influence social recognition [9]. Though it is certainly important to maintain vigilance in avoiding EDCs for our own individual health, it is now clear that we are also responsible for the health of generations to come. We exist in a time where the success of our reproduction is a result of our actions. The mice studies illustrated in this article provide profound evidence that exposure to these chemicals should not be neglected, and we must acknowledge the responsibility we have to protect the future of humanity.

Male VS Female Product Usage:

How do American men and women compare with personal care product (PCP) usage? We delve into the stats to show you how these two groups compete! (1)

By: Fiona Griffin

MEN

6 Average number of personal care products used daily

85 daily average number of chemicals American men are exposed to from PCPs

$270 average spent on PCPs annually

81% of men worldwide state that health and wellness influence the purchases of personal care products. (2)

WOMEN

12 Average number of personal care products used daily

168 daily average number of chemicals American women are exposed to from PCPs

$663 average spent on PCPs annually

Aside from cultural norms, women spend more due to the wider variety of products and gendered pricing. To investigate gendered pricing,The University of Florida conducted a study verifying if women's products cost more to manufacture. Companies like Barbasol asserted that women's deodorant cost more to make. However, the only evident difference between men and women's deodorant was the scent, yet the women's deodorant cost $0.30 more (3).

"According to NPD's iGen Beauty Consumer report, nearly 40% of adults aged 18-22 have shown interest in gender-neutral beauty products." (4)

If this is the case, the gendered pricing of products will surely receive more attention and scrutiny in the coming years

(1): Statistics come from 2009 survey conducted by the Environmental Working Group,
(2): Cosmestics, design-europe.com, Kacey Culliney, (2019).
(3): MoneyCrashers website, contributors, (2019).
(4): CNBC.com, Nia Warfield, (2019)

YOUR ETHICAL PALETTE

BY: LEAH THOMAS

Acaderma The Oasis Barrier Booster

Protect your skin this upcoming winter with this barrier booster moisturizer. Dry skin is common when the temperature falls and this product targets dry and damaged skin to give you that beautiful, glowing healthy skin.

Mineral Fusion Blush, Airy

The cold air this season can dull the natural coloring in skin. Create that natural flush back into the apples of your cheeks with the Mineral Fusion Blush in Airy. The slight shimmer reflects light elegantly on your skin giving you that youthful glow.

One of One by C'est Moi Flash Please, Show Stopper

Create that striking eye look with this multi-use product. This C'est Moi beauty product can be used as a highlighter on your eyes and your face directing the light to the high point on you face instantly lifting and accentuating your best features.

Beautycounter Lip Gloss, Poppy Shimmer

Celebrate the holidays with your quarantine safe group with this gorgeous bold poppy lip gloss. The shimmer in this product gives a beautiful shine to your lips giving you that plump pout.

Saie Brow Butter, Clear

Brows frame your face. Keep them from behaving out of control with this clear brow gel. Formulated to be used on a variety of hair colors, this gel will keep your brows in place all day long, naturally giving you that fuller brow look in rain or shine.

Kapa Nui Nail Color, Hana Aloha

The nail salon might be closed where you live, but you can still have that freshly manicured look with this non-toxic nail polish. This plum color will look marvelous on your nails and deep tones are in this season.

Biossance Squalane + Omega Repair Hand Cream

Washing your hand is a great habit these days, especially with the greater transmission of illness this period. Replenish the moisturize in your hand with this hand cream and decrease the signs of aging that dryness can contribute to.

SOURCE: ALL IMAGES PROVIDED BY "EWG'S SKIN DEEP DATABASE"

“

WOMEN ARE THE FIRST ENVIRONMENT. WE ARE AN EMBODIMENT OF OUR MOTHER EARTH. FROM THE BODIES OF WOMEN FLOWS THE RELATIONSHIP OF THE GENERATIONS BOTH TO SOCIETY AND THE NATURAL WORLD. WITH OUR BODIES WE NOURISH, SUSTAIN AND CREATE CONNECTED RELATIONSHIPS AND INTERDEPENDENCE. IN THIS WAY THE EARTH IS OUR MOTHER, OUR ANCESTORS SAID. IN THIS WAY, WE AS WOMEN ARE EARTH

”

KATSI COOK, MOHAWK MIDWIFE AND ENVIRONMENTAL REPRODUCTIVE JUSTICE ACTIVIST

Does she matter?

In the patriarchal society we live in, a woman's role, how she is perceived, and how she exists has largely been decided for her. Therefore, in fearless resistance, women have had to take it upon themselves to make it firmly known that our health should be a priority, and as Katsi Cook asserts, should be held as precious as an embodiment of our Mother Earth. The toxins that enter our bodies unbeknownst to us act as violent reminders that deep rooted problems still exist and more work needs to be done.

by: alyssa s. moreno

REPRODUCTIVE JUSTICE

Reproductive Justice is rooted in the Reproductive Rights Movements of the 1960s and 70s where women fought for their rights regarding birth control and abortion. Notable Supreme Court cases like Roe v. Wade in 1973 highlighted key moments in the movement for reproductive rights[1]. However, the mainstream movement largely only addressed the needs of White women, leaving the specific concerns of Black, Indigenous, and women of color largely ignored. In the 1980s, women left to the margins took it upon themselves to create community-based organizations like Sistersong and Asian Communities for Reproductive Justice to discuss community-specific concerns that were long ignored by the mainstream White-dominated movement at the time[2].

Reproductive Justice is defined by Loretta Ross of SisterSong as "the complete physical, mental, spiritual, political, social, and economic well-being of women and girls, based on the full achievement and protection of women's human rights" [3]. Reproductive Justice is a theoretical framework grounded in activism that delivers an expanded version of the reproductive rights movement, beyond just the individual's choice. The Reproductive Justice Movement seeks the liberation of entire communities, ones that were historically denied reproductive, and therefore cultural continuance [2].

The issues with EDC exposures we discuss in this article are reproductive justice issues, as so many Black, Indigenous, and women of color have been disproportionately exposed to reproductive harms through food, personal care products, and feminine hygiene products[4]. These are harms to culture, individual choice, and reproductive capacity that continue a cycle of systemic and structural oppressions far beyond the scope of what the mainstream White-dominated movement of the 1960s had tackled. When we discuss EDCs and reproductive harms, we should always address the disproportionate effects on BIPOC, and give credit where it is due to Reproductive Justice organizations for bringing these issues to the forefront.

Beauty standards are rooted in sexism and racism, and are constantly perpetuated by targeted racial and ethnic marketing used by many personal care product companies. Colorism, hair texture preferences, and odor discrimination are all external social factors that lead to BIPOC women being disproportionately exposed to EDCs and therefore affect their reproductive capacities[4].

Reproductive capacities are important for BIPOC women, especially because oppressive structures that have been practiced throughout history to tighten control over BIPOC communities and undermine their ability to reproduce, both biologically and culturally. Through direct reproductive violence in the form of forced sterilizations [5], family separation [6], and as we emphasize in this magazine: EDC exposures through personal care products, BIPOC women have faced numerous attacks on their identities, families, and bodies.

"examples of disproportionate beauty product exposures among vulnerable populations" courtesy of Zota et. al [4]

odor discrimination

Historically, moral judgement was placed upon Black American women as a means of controlling sexual behavior. Vaginal douches, deodorants, and creams are marketed towards Black women. This disproportionately exposes Black women to phthalates , which is discussed in more detail below.

African American women report to use vaginal douches and fragranced cleansing products more than white women. (Zota et. al, 2018)

colorism

People use skin lightening creams that expose them to mercury. This leads to mercury poisoning, neurotoxicity, and kidney damage.

"Asian Americans spend 70% more than the national average on skin care products." (Zota et. al, 2018)

hair texture preferences

Social norms surrounding hair texture have led to Black women using more hair relaxers and products that expose them to parabens and estrogenic chemicals that may cause tumors and disrupted puberty.

"African American consumers purchase 9x more hair and beauty products than other groups." (Zota et. al, 2018)

by alyssa s. moreno

TOXIC RACISM

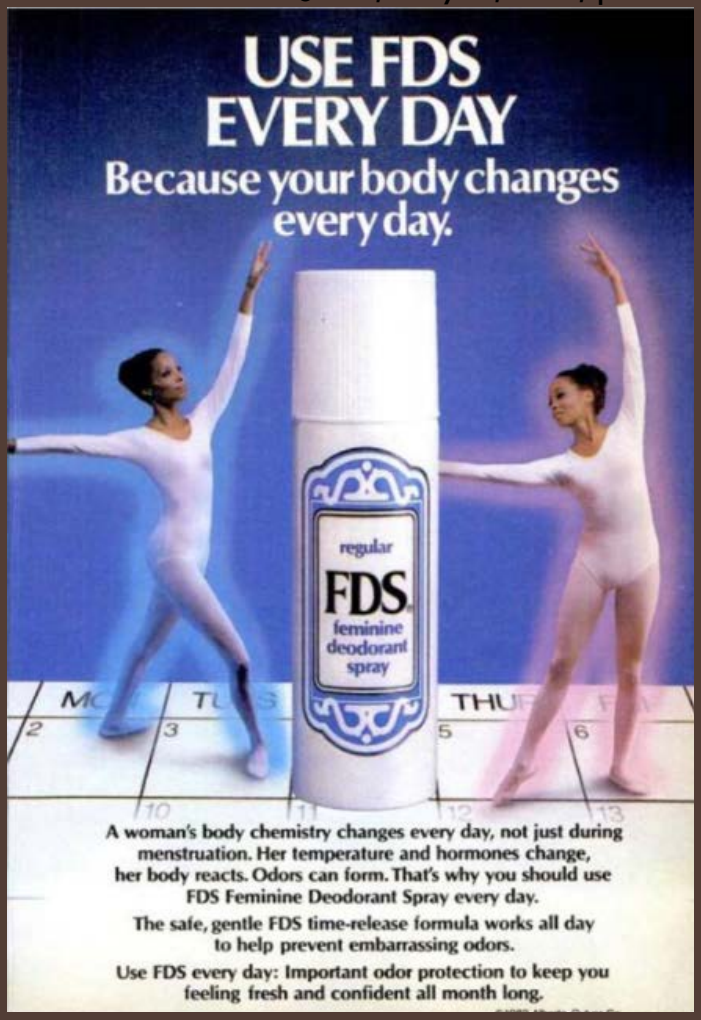
Let's dig deeper and explore an example of how pressure on BIPOC women to use personal care products has turned dangerous.

What we do with our goods is our business, but how we go about taking care of them has a long history of societal pressure and toxic beauty standards. For Black women in particular, this story can be told through an analysis of advertising, odor discrimination, and control over one's own sexual virtue.

Douching is a form of vaginal deodorant that cleans the inside of the vagina, and is usually sold as bottles with cleaning mixtures inside. These mixtures are usually fragranced, and are squirted inside the vagina to rinse the area out [1]. Nowadays, using these types of vaginal deodorants isn't as common, but the history of vicious racial stereotyping and sexual moralization has left a deep indent in how Black women are perceived and discriminated against. Around 59% of Black women douche compared to 27% of white women[2]. These stats make the issue here clear, but to tell the whole story, it is necessary to delve into the racialized and violent history that led us to this point.

Europeans and Americans dehumanized Black bodies by first fixating on an imagined idea of odor specific to Black people, which led to constant obsession over "olfactory stereotypes" that allowed whites to justify slavery and segregation. Even through the lens of scientific authority, they made biased claims that Black people have a "particularly objectionable odor" [2]. Eventually, white people tied their beliefs in inherent racial differences like odor to hypersexuality, and therefore stigmatized the body odor of Black women as signs of promiscuity[2].

6 Jet, May 17, 1982, p. 19.



Advertisement from *Jet*, a magazine popular in the African American community, encouraging women to use vaginal deodorants

This sexual objectification of Black women was and is dangerous, and studies show that domestic and sexual violence are linked to stereotypes about odor, and therefore the practice of douching[2]. All this stereotyping based on racism taught Black women that they had to smell a certain way in order to protect themselves from sexual violence tied to odors, and as douching was a historically common practice for all women to clean their vaginas, they began to douche more often than white women[2]. This led to cultural and beauty norms through family traditions perpetuating myths that one needed to make themselves appear "fresh" and "clean," exemplified in advertisements like the ones below.

Why is douching a serious health effect for women? These culturally-ingrained beliefs are dangerous for more than their ideological racism, as douching is linked to exposing people to EDCs. Vaginal douching exposes people to phthalates, specifically diethyl phthalates (DEP). Individuals who regularly douche have higher exposures to diethyl phthalate (DEP), up to 150% more than those that don't. Most douching products contain fragrances, which are largely unregulated because they are vaguely classified under the term "cosmetics" and are known to contain DEP[3]. Mono-ethyl phthalate (MEP) is a metabolite of DEP and has been found in urine samples of fragrance users 3 times the amount of non-users, a rate 52% higher.

MEP has also been found to be associated with adverse reproductive outcomes like developmental and pubertal disruption[3]. This is of higher concern because douching is used in the vagina, and may come in contact with the vulva, which has mucous membranes that more readily absorb chemicals, meaning DEP can be more readily absorbed into the body[4]. DEP is considered a non-persistent chemical, so it doesn't last as long in the body as other EDCs, but chronic exposure by continued use of vaginal douches puts users at increased risk[5]. Moreover, higher rates of MEP are associated with infertility, causing many women to have to seek alternative means of having children[5]. Therefore, since Black women are more likely to use douching products, and are therefore more exposed to EDCs and reproductive complications.

Once advertisers became aware of the increasing buying power of the Black dollar, they noted that Black people were more likely to use personal care products like douches and vaginal detergents. Countless ads for douching products popped up in the pages of magazines focused on Black life and culture such as Ebony, Jet, and Essence, even as douching advertisements began to disappear from White-oriented magazines[2]. It seems as though the pursuit of the Black dollar became more important than preserving the health of Black women.

Jet, February 13, 1989, p. 31.[7]

Another advertisement from *Jet*, promoting the use of vaginal douching and encouraging the practice to be passed down to young girls.

This all leads to a larger discussion: what long standing racist attitudes are ingrained in us, and how are we perpetuating them? And further, how are these beliefs toxic and putting people in harm's way? Douching is now strongly recommended against by the American Public Health Association[4] but the ideas perpetuating the use of douching are more likely to be culturally and generationally passed down to daughters[2]. These beliefs that plague Black women have been internalized because we live in a Westernized, patriarchal, and colonial society that has a long and ruthless history of attacking and oppressing Black women in particular.

It is therefore a necessary and continuous process to take it upon ourselves to unlearn these dangerous attitudes based on racism and misogyny and push for further policy and regulation on these products that manifest as targeted, and in many cases, **toxic**.

“

I WENT TO CAPITOL HILL WITH @ENVIRONMENTALWORKING GROUP YESTERDAY TO ADVOCATE FOR SAFER PERSONAL CARE PRODUCTS BECAUSE EVERYONE, INCLUDING CHILDREN DESERVE TO BE PROTECTED FROM CHEMICALS IN THEIR PRODUCTS WE KNOW CAUSE HARM. IT'S TIME FOR CONGRESS TO DO ITS JOB. STAND WITH ME AND TAKE ACTION TODAY. #BEAUTYMADEBETTER

”

KOURTNEY KARDASHIAN

– BEAUTY MADE BETTER –

By: Leah Thomas

Until the United States can establish proper safety regulations, it is unfortunately up to consumers to purchase items that are both safe and fulfilling of their purpose. In the current market, we simply cannot rely on government regulation and manufacture honesty to provide the safety standards needed in order to prevent any female reproductive health disorder and or illness. This responsibility now falls on the consumer.

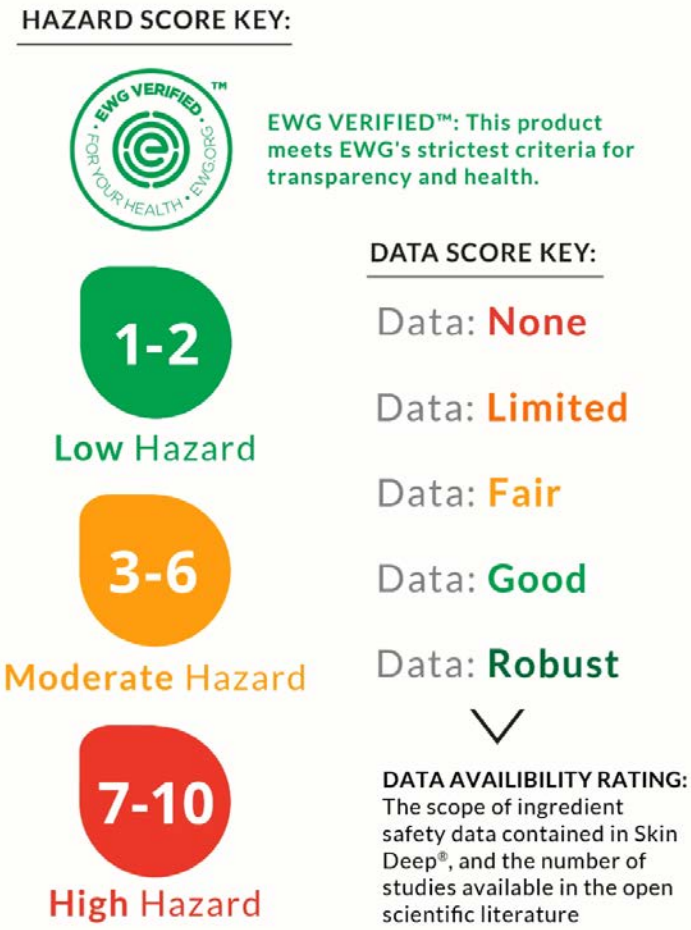
Top Photo
"EWG VERIFIED™ mark"
From: Environmental Working Group
https://www.ewg.org/ewgverified/

How do manufacturers take advantage of consumer knowledge?

Since 2014, the use of words such as "organic" and "natural" became increasingly popular and products with these words sold an average of 7.4% more than their counterparts [1]. However, there is no legal or conclusive definition for what a "natural" product consists of, and therefore manufacturers can simply slap these words on almost any products without standards or consequences for monetary gain.

Is there a potential solution to this expansive issue?

Fortunately, advocacy organizations such as the Environmental Working Group (EWG) have created a regulatory program to promote safer consumer products and campaign for controlled use of chemicals in the industry [1]. The EWG has created a modern tool called "Skin Deep", a database with thousands of recommended products that are marked as "EWG Verified" after passing strict criteria such as full transparency of ingredients and ethical manufacturing practices [2]. Additionally, EWG has launched its mobile "Healthy Living" app to make it easier for consumers to shop in the market with the single touch of a cell phone [2]. After downloading the app, users can search for a variety of EWG approved products that extend beyond personal care and cosmetics, such as, household cleaners, hair care, oral care, and much more! Additionally, with the new scanning feature, you simply need to take your phone to your local store and verify the barcode, and the Healthy Living App can identify many products, even ones that are not EWG certified. Each of these products is then rated on a hazard scale from 1 to 10 based on 17 categories which include endocrine-disrupting potential, cancer, neurotoxicity, and reproductive/developmental toxicity [3]. The data the EWG used to assess these chemical hazards has been cross-linked with over 60 databases to create a general pool of ingredients for their index [3].



Top Photo
"Understanding Skin Deep® ratings"
From: Environmental Working Group
https://www.ewg.org/skindeep/understanding_skin_deep_ratings/"

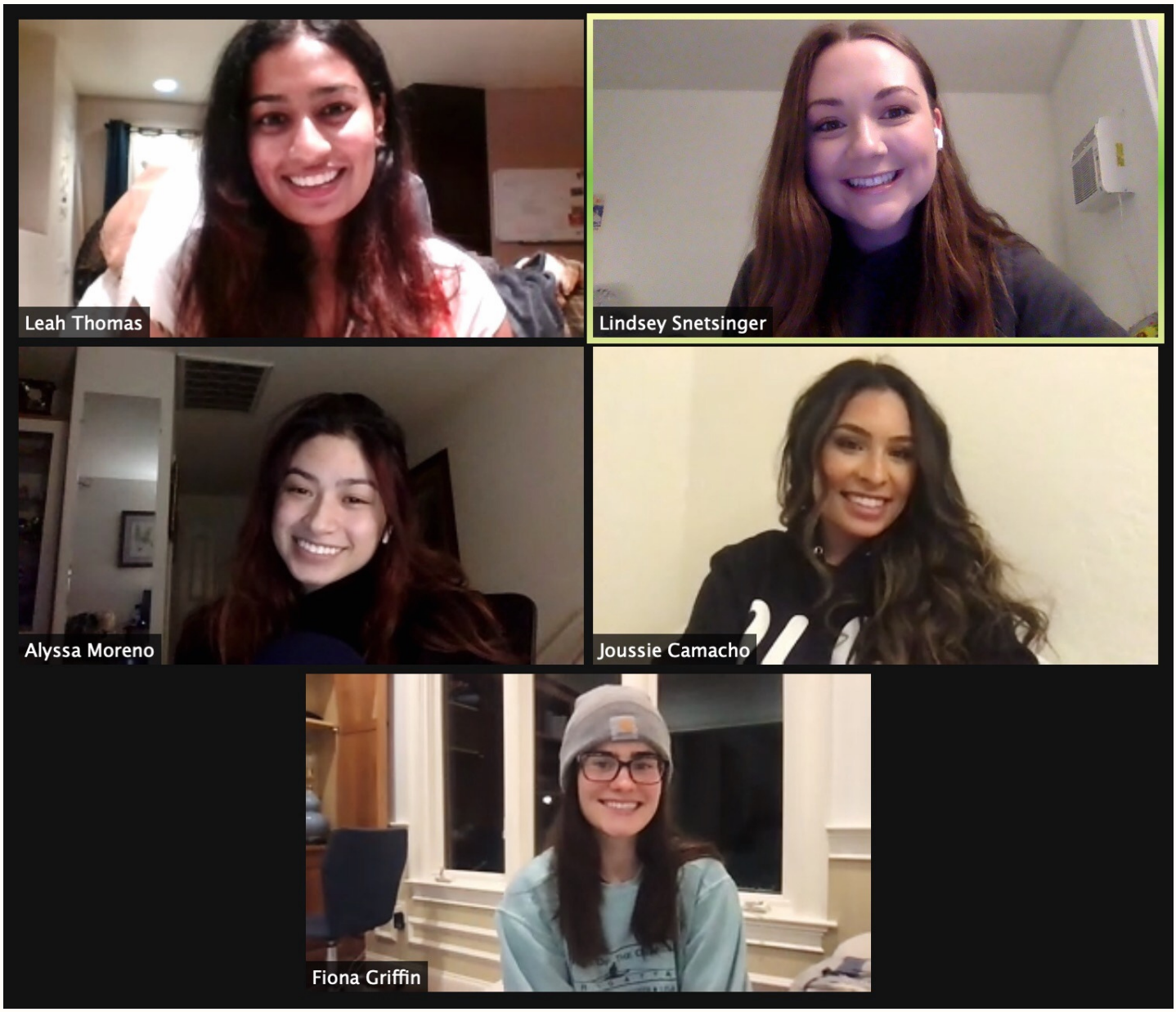
"WITH SUPPORT FROM INDUSTRY AND ADVOCACY GROUPS, AS WELL AS DEMOCRAT AND REPUBLICAN COSPONSORS, THE BILL MAY AT LAST PAVE A ROAD FORWARD FOR THE ENTIRE U.S. BEAUTY SECTOR." (1)

Many individuals support the EWG and its cause, including reality-TV personality, Kourtney Kardashian. In 2018, the media star joined EWG on Capitol Hill to promote the Personal Product Safety Act (mentioned on p. 19) to advocate for safer ingredients in the products she and her children use every day [4]. Like many new mothers, she became increasingly aware of the types of baby products she was using on her first child, which prompted her to use the "Healthy Living" app for her personal research [4]. Now, many others can use this application with the click of a few buttons, all in one place, without the burden of having to investigate every single product for yourself. With this completely free-to-use cellular application, the EWG has proven that it deeply cares about consumer knowledge and protection from potentially harmful chemicals in everyday products.

Is there a way we can look forward and expect a safer and more well-regulated future for personal care products?

Companies such as Walmart, Target, CVS, Whole Foods, and Walgreens have launched their store brands to exclude controversial ingredients in their products and create a list of "high priority chemicals" [1]. Additionally, the Personal Care Products Act is a way towards change in the industry, and you can advocate by encouraging your senator to co-sponsor and support the Safety Act. Other organizations like the Endocrine Society, Beautycounter, and the American Academy of Pediatrics has also endorsed this bill [5]. Without this act, we may go decades without creating reform in the industry by not taking action and comprising the health of American individuals. Within the next couple of years, we hope to see change at the legislative levels for manufacturers to be legally accountable for their actions and create products that do not compromise the safety of their consumers. Right now, the best thing we can do is to educate ourselves about what we are putting on and in our bodies to begin to make improvements for our own health.

About the Editors



As seniors at UCLA in the Human Biology and Society Major, we have completed this magazine as our final research endeavor to explore the intersectionality of contemporary lifestyles and human health. As women, consumers, and potential reproducers, we are passionate about how the personal care products we use every day affect our endocrine systems and reproductive health. The aim of this project is to research, educate, and advocate for safer cosmetics in the U.S. and protect female consumers from compromising their reproductive abilities. This project was completed during the COVID-19 pandemic and all contributions were added virtually. Above is a real-life snapshot of the "new normal" for research and academia.

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