

# Are Disposable Diapers Harming Children's Health?

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✓ Fact Checked

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## STORY AT-A-GLANCE

- › Babies' health is assaulted from all sides through exposure to toxins in their limited environment including plastic particles in the water supply and baby bottles, heavy metal in store-bought baby food and diapers loaded with toxic chemicals
- › Although the Consumer Product Safety Commission is tasked with regulating the industry, diapers are only tested for lead. Diapers are incontinent supplies for babies, but they are not regulated under medical devices by the FDA, as are adult supplies
- › Babies may use up to 2,500 diapers in the first year of life and up to 4,800 by the time they are toilet trained; diaper testing has found a list of volatile organic compounds, pesticides, formaldehyde, fragrances and dioxins in multiple products, several of which exceeded the health threshold
- › In addition to the cognitive and physical impairment associated with exposure to environmental toxins, disposable diapers have a significant impact on the environment, including the sheer number of diapers that reach landfills and off-gassing methane as they degrade
- › Consider using Environmental Working Group (EWG) verified disposable diapers to lower the risk of exposure to toxins, or switch to organic cotton or hemp cloth diapers. The EWG recommends checking ingredients and avoiding fragrances and lotions on babies' skin

Babies' health is assaulted from all sides through exposure to toxins in their limited environment. Their first bowel movement has more plastic chemicals than adults<sup>1</sup> and

they continue to consume plastic particles from the public water system<sup>2</sup> and baby bottles.<sup>3</sup> Over-the-counter baby food is tainted with heavy metals<sup>4,5</sup> and diapers are filled with toxic chemicals children absorb through their skin.<sup>6,7</sup>

In the fight to provide you and your family with safer personal care products, the Environmental Working Group (EWG) developed the Skin Deep database<sup>8</sup> where they publish chemical reviews of personal care products. You can also search for EWG Verified<sup>9</sup> personal care products that have been tested and are the safest to use in their category, including diapers.

These often-overlooked personal care products for babies can expose infants to a load of toxic chemicals, which are pressed against the baby's skin nearly 24/7 until they are potty trained. This can be two or more years that babies are exposed to chemicals pressed against their genitals with known negative health effects.

Experts estimate that in the first year a baby will go through 2,500 disposable diapers.<sup>10</sup> Parents often consider comfort, absorbency and fit but research indicates that the materials and ingredients are likely more important when you consider that a diaper may potentially harm a child's health.<sup>11</sup>

## **Diapers Are Not Tested for Safety**

The Consumer Product Safety Commission<sup>12</sup> is the agency tasked with regulating the diaper industry. Yet, they do not require testing, other than for lead, to ensure safety.<sup>13</sup> Manufacturers are also not required to publish the product's ingredients. This makes it difficult for consumers who are looking for safer options for their children. Additionally, the U.S. Food and Drug Administration does not regulate the diaper industry.

While the Code of Federal Regulations Title 21 covers medical devices that are intended to protect against incontinence, this "does not include diapers for infants."<sup>14</sup> In other words, the smallest, youngest and most vulnerable members of society wear incontinent supplies for two years or more of their lives that are not safety tested and have tested positive for toxic poisons.

In 2019, the French Agency for Food, Environmental and Occupational Health and Safety<sup>15</sup> tested 23 diapers from a list of best-selling diapers on the market, including retailer brands and those listed as "eco-friendly." The researchers wrote that disposable diapers have been used by over 95% of babies in France for nearly 20 years.

They estimated that babies use up to 4,800 diapers before they are toilet trained. The most common skin problems were dermatitis that was triggered by an irritant, infection, or allergic reaction, and the prevalence of diaper dermatitis was estimated to be up to 50% in babies.

Testing of the 23 products revealed a list of volatile organic compounds, pesticides, formaldehyde, fragrances and dioxins. In the list of pesticides found inside the diapers, the majority were currently prohibited for use in the EU. Several of the chemicals the researchers detected in the diapers exceeded the health threshold the agency considered safe for infants.

A second study<sup>16</sup> published in 2019 looked at the toxic contents of sanitary pads and diapers as they are made of plastic materials and contain volatile organic compounds (VOCs). The analysis showed a large difference in levels of VOCs and phthalates between brands of diapers and sanitary pads. Phthalate concentrations were higher than what is commonly found in commercial plastic products. The researchers warned:<sup>17</sup>

*"As sanitary pads and diapers are in direct contact with external genitalia for an extended period, there is a probability that a considerable amount of VOCs or phthalates could be absorbed into the reproductive system."*

## **Dangerous Diaper Components Raise Risk of Toxic Damage**

The 2019 study<sup>18</sup> helped uncover a gap in regulating menstrual products and baby diapers, which Environmental Health News calls, "emblematic of our society's historical unease with having productive conversations about women's reproductive health."<sup>19</sup>

In 2020, the EWG published their guide to safer diapers, in which they listed some of the ingredients and materials that are commonly used across the diaper industry.<sup>20</sup> You may recognize some of the types of chemicals.

Diapers have five major components designers use to absorb fluid and waste products, keep them from leaking and keep the baby's skin as dry as possible. These components include a top sheet that sits close to the baby's body, a back sheet, the core absorbent material, leg cuffs and a closing system. The top sheet and back sheet are made primarily of plastic materials as are the leg cuffs and closing systems.

A 2019 study<sup>21</sup> published in Environmental Science and Technology assessed the toxicity of eight plastic chemicals that can be found in disposable diapers. They found that 74% of the 34 plastic chemicals triggered at least one negative endpoint, including cytotoxicity, estrogenicity and antiandrogenicity. They concluded:<sup>22</sup>

*"Consumer plastics contain compounds that are toxic in vitro but remain largely unidentified. Since the risk of unknown compounds cannot be assessed, this poses a challenge to manufacturers, public health authorities, and researchers alike."*

Diapers also typically include a super absorbent polymer in the core designed to absorb 300 times its weight in liquid.<sup>23</sup> The most common of these is sodium polyacrylate which, according to the EWG,<sup>24</sup> can be contaminated with residual amounts of acrylamide and acrylic acid. Acrylamide is classified by the National Toxicology Program<sup>25</sup> as reasonably anticipated to cause cancer, and the Environmental Protection Agency<sup>26</sup> finds acrylic acid is a strong skin and eye irritant.

## **There Are More Chemicals in Diapers**

Because manufacturers do not need to disclose the chemicals used, there are likely other unknown additives in sodium polyacrylate. Manufacturers may also include pulp to increase absorbency and use adhesives to assemble the product. According to the

EWG, many of those adhesives include alkylphenol ethoxylates or APEOs, used to prevent oxidation that degrades the glue's adhesive properties.<sup>27</sup>

The EPA reports<sup>28</sup> these are highly toxic to aquatic life and are associated with developmental problems in rodents. Others are known endocrine disruptors,<sup>29</sup> which may increase the risk of endometrial cancer.

Some diapers include a wetness indicator on the outside which shows parents whether the diaper needs to be changed. The EWG<sup>30</sup> reports that although the exact chemicals used can vary between brands, they mostly consist of harmful toxins, including quaternary ammonium compounds, also called quats.

These have been associated<sup>31</sup> with reproductive and developmental problems as well as respiratory effects and skin irritation. Finally, most diapers contain some sort of fragrance or perfume, known to trigger contact dermatitis that affects between 20% and 35% of all children.<sup>32</sup>

Other experts estimate<sup>33</sup> that up to 16% of the population are allergic to product fragrances. The National Eczema Association<sup>34</sup> reports 20% of the general population have a sensitivity to the chemicals used to produce fragrances.

## **Babies and Women Exposed to Hormone Disrupting Chemicals**

The study<sup>35</sup> published in *Reproductive Toxicology* was triggered by an investigation in the South Korean media outlets that began in 2017.<sup>36</sup> It was discovered that a new brand of sanitary pads produced by the company Lillian triggered menstrual problems and irregularities in more than 15,000 women who signed a class action lawsuit that claimed they experienced infections, irregular periods and bad cramping from using the sanitary pads.<sup>37</sup>

These effects may have been the result of exposure to endocrine disrupting chemicals (EDCs), which are among the most destructive chemicals in the environment and are linked<sup>38</sup> to growth, neurological and learning disabilities as well as obesity, diabetes, birth defects, cardiovascular disease and male and female reproductive dysfunction.

EDCs are not just harmful – they are also found almost everywhere and are hard to avoid. They lurk in food packaging, nonorganic food, nonstick cookware,<sup>39</sup> detergents,<sup>40</sup> cosmetics, lotions,<sup>41</sup> products with fragrance, antibacterial soaps,<sup>42</sup> medicines, toys,<sup>43</sup> fabrics, carpets, furniture, construction materials treated with flame retardants, pesticides and more.

The book, "Count Down," by Shanna Swan expands on what she describes is an impending fertility crisis; along with the dropping sperm counts, changes in sexual development pose a threat to human survival and, according to Swan, "The current state of reproductive affairs can't continue much longer without threatening human survival."<sup>44</sup>

In fact, she estimates that if current projections continue, sperm counts could reach zero in 2045. Endocrine-disrupting "everywhere chemicals" are a key culprit, she says: "Chemicals in our environment and unhealthy lifestyle practices in our modern world are disrupting our hormonal balance, causing various degrees of reproductive havoc."<sup>45</sup>

## **Disposable Diapers Have a Significant Environmental Impact**

In addition to the lifelong cognitive and physical impairment that can accompany exposure to environmental toxins,<sup>46</sup> and the link between phthalate exposure and poor growth and development,<sup>47</sup> disposable diapers also have a significant impact on the environment.

This is a logical finding since the primary component in disposable diapers is plastic material that does not degrade quickly. According to the EPA,<sup>48</sup> 4.1 million tons of disposable diapers hit the landfills each year carrying with them pathogens from the solid waste products they contain.

While degrading in the landfill, disposable diapers create methane and other toxic gasses.<sup>49</sup> Producing plastics also releases chemicals like dioxins and benzene that pollute the air and produce greenhouse gas emissions. In 2018, plastic manufacturing plants released 128 million pounds of pollutants into U.S. waterways.<sup>50</sup>

## Choose Diapers to Lower the Risk of Toxic Exposure

As dangerous for children and difficult for the environment as disposable diapers are, there's no getting around the convenience factor. There are companies that strive to make healthier products with better components for children and the environment. The Environmental Working Group has developed an EWG Verified<sup>51</sup> list of personal care products, including diapers and baby care products.

In 2020 the U.S. personal care market was valued at \$4.72 billion and projected to reach \$7.98 billion by 2028.<sup>52</sup> Every day the average woman uses 12 personal care products and men use six.<sup>53</sup> Out of this vast market, EWG has found 2,154 personal care products that meet their strict standards.

With an eye on the health of future generations, they have also verified baby care products,<sup>54</sup> from baby wipes to lotions and diapers that make using disposable products a little safer.

If you're thinking about branching out to cloth diapers, consider reusable cloth diapers made from hemp that may be more absorbent than cotton. Hemp is also a sustainable crop that does not require pesticides or fungicides and grows well with little water.<sup>55</sup>

There's no getting around the fact that babies need diapers. EWG<sup>56</sup> recommends several quick tips to help you choose a safer diaper for you and your child:

- **Ingredients** — If a product doesn't disclose the ingredients, it may not be your best choice. Contact the manufacturer; they may be more willing to disclose all the ingredients with encouragement.
- **Consider cloth diapers** — While they're not a feasible option for everyone, it's also important to remember that not all cloth diapers are the same. Organic cloth diapers can help avoid some of the toxic chemicals found in disposable products and they tend to be better for the environment.
- **Minimal plastic** — It's nearly impossible to find disposable diapers that do not use plastics, so look for brands that have a minimal amount. Also look for plain, undyed

diapers with minimal or no designs.

- **Avoid fragrances and lotions** – Avoid products that add fragrances as they increase the risk of contact dermatitis and allergic reactions. Fragrances are also made with toxic chemicals and increase the risk of exposure. If you like a lotion, choose a product that is free of phthalates, parabens, bisphenols, PFAS and fire-retardant chemicals.

## Sources and References

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- <sup>1</sup> Environmental Science and Technology Letters 2021; doi.org/10.1021/acs.estlett.10c00559
- <sup>2</sup> Surfrider Foundation, Microplastics Found in Our Drinking Water
- <sup>3</sup> Nature Food, October 19, 2020
- <sup>4</sup> Washington Post, February 4, 2021
- <sup>5</sup> U.S. House of Representatives, February 4, 2021
- <sup>6, 16, 17, 18, 35</sup> Reproductive Toxicology, 2019;84
- <sup>7</sup> Environmental Health News, January 28, 2019
- <sup>8</sup> EWG, Skin Deep
- <sup>9</sup> EWG Verified
- <sup>10</sup> Love to Know, How Many Diapers Does a Baby Use in a Year?
- <sup>11, 56</sup> EWG, December 10, 2020
- <sup>12</sup> U.S. Consumer Product Safety Commission, Children's Products
- <sup>13</sup> U.S. Consumer Product Safety Commission, Diaper
- <sup>14</sup> US FDA, Code of Federal Regulations Title 21, identification
- <sup>15</sup> French Agency for Food, Environmental and Occupational Health and Safety, Safety of Baby Diapers
- <sup>19, 36, 37</sup> Environmental Health News, January 28, 2019, That's chronic exposure
- <sup>20, 24, 27, 30</sup> Environmental Working Group, December 10, 2020, Guide to Safer Diapers
- <sup>21, 22</sup> Environmental Science and Technology, 2019;53(19)
- <sup>23</sup> Scientific America, August 25, 2016
- <sup>25</sup> National Toxicology Program, Acrylamide
- <sup>26</sup> Environmental Protection Agency, Acrylic Acid
- <sup>28</sup> EPA, Fact Sheet: Nonylphenols and Nonylphenol Ethoxylates Q6
- <sup>29</sup> Environmental Pollution, 2020;267(115475)
- <sup>31</sup> C & EN, 2020;98(30)
- <sup>32</sup> Medscape, Pediatric Contact Dermatitis
- <sup>33</sup> Postepy Dermatol Alergol. 2013;30(5) Fragrances
- <sup>34</sup> National Eczema Association May 29, 2013
- <sup>38</sup> Endocrine Society, January 24, 2022, Symptoms and Risk Factors
- <sup>39, 42</sup> Endocrine Society, January 24, 2022



- <sup>40</sup> National Institute of Environmental Health Sciences, Endocrine Disruptors
- <sup>41</sup> Talanta Volume 234 November 1, 2021
- <sup>43</sup> PLOS|One. 2020; 15(4)
- <sup>44, 45</sup> The Guardian February 26, 2021
- <sup>46</sup> World Health Organization, Children's Environmental Health
- <sup>47</sup> Current Opinions in Pediatrics, 2013;25(2)
- <sup>48</sup> EPA, Nondurable Goods: Product Specific Data
- <sup>49</sup> Science of the Total Environment, 2022;836(155339) 3.1 25% DTP
- <sup>50</sup> Turtle Island, August 8, 2019
- <sup>51</sup> EWG, EWG Verified Products
- <sup>52</sup> Verified Market Research, Personal Care Market Size and Forecast
- <sup>53</sup> University of Illinois Extension, Personal Care Products
- <sup>54</sup> EWG Verified, Baby Care
- <sup>55</sup> Going Zero Waste, December 22, 2021