



Sunscreen Toxic Chemicals to Avoid and Why:

According to the EWG, in 2019, the federal Food and Drug Administration, the agency that governs sunscreen safety, put forth its' most recent update to sunscreen regulations, indicating **only two ingredients, zinc oxide and titanium dioxide, could be classified as safe and effective, based on the currently available information.** Further, in the past year, numerous new studies have raised new concerns about endocrine-disrupting effects from three other sunscreen ingredients: oxybenzone, avobenzone and homosalate.

According to several studies published by the FDA, the ingredients oxybenzone, avobenzone, homosalate, octinoxate, octisalate, and octocrylene, are systemically absorbed into the body after one use (Matta 2019, Matta 2020), These same studies also found that they could be detected on the skin and in the blood weeks after no longer being used (Matta 2020). Previous studies detected many sunscreen ingredients in breast milk and urine samples (Schlumpf 2008, Schlumpf 2010).

Recently, the European Commission found current human exposure levels to oxybenzone to be unsafe and proposed a concentration restriction of 2.2 percent (SCCS 2020), which is lower than the limit amount allowed in U.S. sunscreens, which is up to 6 percent. Several countries ban the sale of sunscreens that contain this ingredient, because it may be harmful to aquatic life as well as humans.

Below is a list of some of the most concerning chemicals in sunscreen:

(1) Oxybenzone: A CDC 2008 study found 97% Americans are contaminated with Oxybenzone, an ingredient in most (more than 600) sunscreens. Higher levels were reported in those using sunscreens (Zamoiski 2016) and there is potentially greater harm to children (FDA 2019). Further, researchers found that adolescent boys with higher oxybenzone measurements had significantly lower total testosterone levels (Scinicariello 2016).

The CDC study shows that nanoparticles like Oxybenzone are linked to cancer (skin included), allergies, skin reactions, hormone and endocrine disruption and cell damage. It also increases the chance of other harmful chemicals penetrating the skin. Animal research suggests that oxybenzone (found in 80 percent of chemical sunscreen products) and octinoxate are toxic to reproductive systems and can interfere with development.



The Environmental Working Group (EWG) found that it causes photosensitivity and an increased production of harmful free radicals with the ability to attack DNA. The EWG is pushing for the FDA to ban oxybenzone.

(2) Avobenzone: Because avobenzone is not stable, it must be paired with other ingredients that act as stabilizers to prevent it from breaking down in the sun. Breakdown products of avobenzone can cause allergic reactions (Nash 2014) and other adverse effects. Avobenzone can disrupt the endocrine system and has been shown to block the effects of testosterone in cellular studies (Klopcic 2017).

(3) Homosalate: Homosalate has been found to penetrate the skin, disrupt hormones and produce toxic breakdown byproducts over time with sunlight exposure (Krause 2012, Sarveiya 2004, SCCNFP 2006, Matta 2020). **Other MODERATE concerns:**

According to the EWG, a recent opinion from the European Commission found that homosalate was not safe to use at concentrations up to 10 percent and recommended a maximum concentration of 1.4 percent, because of concerns for potential endocrine disruption (SCCS 2020). The FDA allows U.S. sunscreen manufacturers to use it in concentrations up to 15 percent, well above the European Commission's recommendation of 1.4 percent maximum.

(4) Octinoxate: It is readily absorbed into the skin and continues to be absorbed after the sunscreen has been applied. It has been found in blood 16 times above the proposed FDA safety threshold (Matta 2019, 2020). Animal research suggests octinoxate is toxic to reproductive systems and can interfere with development. Other research indicates it has hormone effects on the metabolic system and affects thyroid hormone production (Seidlova-Wuttke 2006), with some evidence for other endocrine targets, including androgen and progesterone signaling (Krause 2012).

(5) Octisalate: It is an organic UV filter, readily absorbed through the skin at levels 10 times more than 0.5 nanograms per milliliter; the FDA's cutoff for systemic exposure. This cutoff is the maximum concentration that may be found in blood before there are potential safety concerns. A case report showed that the chemical has been linked to allergic contact dermatitis (Singh 2007). Analysis of high throughput screening assays by the Environmental Protection Agency (EPA) suggests octisalate may have endocrine effects, weakly binding to the estrogen receptor.

(6) Octocrylene: Octocrylene readily absorbs through the skin at levels about 14 times the FDA cutoff for systemic exposure (Hayden 2005, Matta 2020). It is used as a stabilizer and multiple studies indicate it may disrupt hormones. Studies have found that octocrylene causes relatively high rates of skin allergies (Bryden 2006). It has been linked to aquatic toxicity, with the potential to harm coral health (Stein 2019), and it is often contaminated with the known carcinogen benzophenone.



(7) Parabens: Parabens are a group of chemicals widely used as artificial preservatives in cosmetics and sunscreen products. The concern with these chemicals is that scientific studies suggest that **parabens can disrupt hormones in the body harm fertility and reproductive organs, affect birth outcomes, and increase the risk of cancer.** They can also cause skin irritation. (EWG, Apr 9, 2019)

(8) Vitamin A Palmitate: EWG recommends that consumers avoid sunscreens and other skin and lip products containing vitamin A, retinyl palmitate, retinol, retinyl acetate, retinyl linoleate and retinoic acid. Officials in Germany and Norway have cautioned that retinyl palmitate and other vitamin A ingredients in cosmetics could contribute to vitamin A toxicity when combined with excessive exposure to the sun (German BfR 2014, Norwegian SCFS 2012a).

(9) Avoid Spray-on Sunscreens: In July of 2012, a very scary incident occurred for one man who applied aerosol sunscreen and immediately walked over to his barbecue. Upon lighting the grill, he sustained 2nd degree burns, because the sunscreen had not had time to set into his skin, neither did the propellant chemicals have adequate time to evaporate. According to news reports, the spray also left a vapor trail that added insult to injury. He caught on fire immediately after lighting the grill.

Banana Boat, the makers of the aerosol sunscreen in question, voluntarily recalled their product after hearing of the incident. The company cited a problem with the spray valve as being the reason for the accident.

“The spray valve opening on the affected products dispenses more than is typical in the industry for continuous sun care sprays. As a result, the product is taking longer to dry on the skin than is typical with other continuous sprays. If a consumer comes into contact with a flame or spark prior to complete drying of the product on the skin, there is a potential for the product to ignite.”

Mothers of young kids, and many other people of all ages, love the ease of application that aerosol offers, as well as the fact that spray sunscreen makes it easy to cover all of the hard-to-reach spots.

But are you willing to trade convenience for health?

Besides the fact that aerosols are highly flammable, there are more concerns with this type of sun protection.

First, the Food and Drug Administration has mounting concerns that aerosol sunscreens can be inhaled during application. Both the propellant chemicals and the nanoparticles of zinc oxide and titanium dioxide (found safe in other forms) worry scientists, who say that these particles are easily ingested.



Although the particles can't be absorbed through the skin, they can accumulate in different organs in the body once they are ingested. Because they are so small, they can move freely throughout the body, causing problems at the sub-cellular level. What is worse is the body can't get rid of them.

Each time the sunscreen nozzle is pressed, these particles are transported some 20 feet in all directions, landing on everything in sight. Everyone in the danger zone gets to breathe in the dangerous particles, even if they don't want to.

Further and extremely concerning is the fact that **The International Agency for Research on Carcinogens classified titanium dioxide as a "possible carcinogen" when inhaled in high doses as from an aerosol can.** As noted, it is very hard for the lungs to clear the tiny particles (nanoparticles), which are easily passed into the bloodstream. When these particles penetrate lung or skin tissue, they can cause severe organ damage.

Use caution with loose powder sunscreens as well for the same reason; they contain particles that could end up in the lungs and cause damage.

There are presently no recommendations or guidelines set by the US government regarding the size and characteristics of nanoparticles, to protect from the sun and be safe to users at the same time. As with other personal care products, this is a "caveat emptor" circumstance where consumers must do their own research with regards to safety.

Staying safe

Playing it safe requires forethought. Obviously, the sun is a very important part of health, one that should not be ignored. However, there are rules.

- If you are just getting out in the sun for the first time in the season limit yourself to about **15 minutes and not during peak sunlight hours.**
- If you burn frequently, limit your time to a few minutes each day until your skin begins to slightly darken. **Important to avoid burning & tanning beds.**
- Once you have a nice tan, you can increase the time you spend in the sun.
- Playing or laying all day in the hot sun without any protection and getting burned to a crisp must be avoided at all costs.
- Be especially careful with young children; avoid sunburns.
- Try to stay in the shade between the hours of 12 and 3pm; this is when the sun's rays are the hottest and when burning is more likely.
- After your initial exposure, spend the rest of the day in the shade or covered up with lightweight, cotton clothing, sunglasses and hat or visor.
- Never tan through a window as you will get all UVA rays and none of the beneficial UVB rays.



- If you have to be in the sun for an extended period of time, use an SPF 15+ non-toxic sunscreen. We recommend Mineral based Sunscreens that use Zinc and/or Titanium dioxide (no nanoparticles please). These ingredients can be mixed with organic, unrefined coconut oil (which has a natural SPF) for easier application. **Not sure what sunscreen is safe? Visit the EWG.org for advice and information.**

The Environmental Working Group urges us not to use sunscreen as a tool to prolong time spent in the sun, and to check our skin often for irregular moles or other suspicious spots.

Being choosy about the type of sunscreen that you use for yourself and your family is critical. **The best is one made from natural ingredients that protect you from damaging rays, don't break down on the skin, and allow at least some penetration of UVB rays for the production of vitamin D.**

Specifically, use a moisturizing non-SPF lotion to help keep your skin soft. If you use an SPF lotion it will block out the beneficial UVB rays. Make sure there are no toxic ingredients added to the formula. For natural sun protection, organic coconut oil is a great option and has a natural SPF of 7 to 12. Or make a homemade recipe using coconut oil, nano-particle free zinc oxide and/or titanium dioxide & essential oils. Email info@lifestylequixotica.com for a DIY healthy sunscreen recipe without chemicals.

Visit The Environmental Working Group for a list of [safe sunscreens](#) which contain non-toxic ingredients and offer protection from damaging UVA rays without compromising UVB exposure.

Remember: Enjoy the sun, respect the sun and know what is in your sunscreen.

(10) Zinc and Titanium Dioxide – Both Zinc and Titanium Dioxide are generally considered safe. However, if they have been molecularly changed into nanoparticles there are health and safety concerns as discussed above and should these forms should be avoided.