

Common Antibacterial Chemical Triclosan Raises Public Safety Concerns

EPA risk assessment criticized by environmental, public health groups and water agencies

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A hazardous chemical proliferates in consumer products unchecked. Despite its prevalence in personal care products, plastic, paint and fabrics, and studies linking it to endocrine disruption, cancer, bacterial and antibiotic resistance, as well as widespread environmental contamination, the U.S. Environmental Protection Agency (EPA) has proposed to reregister the antibacterial chemical triclosan. EPA's reregistration eligibility decision (RED) risk assessment for triclosan was roundly criticized by environmental and public health groups, as well as water treatment agencies, during a public comment period from May 7 until July 7, 2008. The comments can be viewed at www.beyondpesticides.org/antibacterial. EPA's review is a testament to the manipulation of risk assessment in the regulatory process and will further erode public confidence in the safety of products in the marketplace.

The U.S. Food and Drug Administration (FDA) and EPA hold joint jurisdiction over triclosan. EPA regulates uses in plastics, toys, textiles, counter tops and sponges, to name a few, while the FDA oversees soaps, deodorants, toothpastes and other personal care products. EPA's draft risk assessment for triclosan, published in the Federal Register on May 7, 2008, acknowledges triclosan's broad reach into consumer products and its prevalence in the human population. However, many important health and environmental impacts have been overlooked by EPA and, as a result, the risk assessment does not fully account for all the adverse impacts posed by triclosan.

Beyond Pesticides, along with Food and Water Watch, Greenpeace U.S., Natural Resources Defense Council, Sierra Club, Pesticide Action Network North America and dozens of public health and environmental groups from the U.S. and Canada, submitted comments to EPA to call for an end to the use of triclosan in consumer products. Several deficiencies in the risk assessment were highlighted in comments to the agency, summarized below.

Triclosan Human Health Risks

According to EPA, triclosan has no registered food uses. However, triclosan has been found in fish and in surface waters. In its analy-



Triclosan and its analog triclocarban are the active ingredients in most antibacterial soaps and other personal care products.

sis, EPA recognizes that triclosan residues pose a potential hazard to humans through food and the water supply. However, a formal *Food Quality Protection Act* (FQPA) analysis was not conducted and no food tolerances for triclosan have been set. As a result, human exposure through the consumption of fish, shellfish and drinking water has gone unaccounted for in the dietary risk assessment conducted by EPA.

EPA's aggregate risk assessment also failed to include infants' exposures and in utero exposures to triclosan, even though independent scientific studies have found the chemical in human breast milk and in the umbilical cord blood. Long term residential exposures to EPA registered products such as counter tops, floors and mattresses were not evaluated, despite the hazards posed by dermal absorption of triclosan such as severe dermatitis and other skin irritations. The ability of triclosan to act as an endocrine disruptor, and its adverse effect on the immune and central nervous system has not been considered.

The groups criticized EPA for relying on biomonitoring data from a sample population instead of laboratory test data evaluating all



Aside from household cleaners, EPA also regulates triclosan that is impregnated in countertops, toys, cutting boards, clothing and more.

possible sources of exposure.

Triclosan Environmental Health Risks

According to the U.S. Geological Survey (USGS), triclosan is one of the most common chemicals detected in the nation's waterways. EPA's assessment concludes that levels of concern were not exceeded for fish or aquatic plants. EPA, when making this conclusion, failed to take into account that algal communities are impacted at concentrations presently found in waterways and that methyl triclosan, a degradate of triclosan, bioaccumulates in fish at concentrations comparable to other persistent organic pollutants. Impaired feeding and swimming activity, as well as endocrine disruption, have been observed in juvenile frogs when exposed to triclosan at concentrations lower than those found in surface water. An endangered species assessment was not conducted.

Triclosan is also a concern for wastewater treatment because of the large concentration of triclosan entering these facilities. Triclosan, being a biocide, removes large populations of beneficial bacteria needed for the water treatment process, placing unnecessary economic burdens on wastewater treatment plants. Sludge or biosolids generated in the water treatment process, which are recycled on agricultural fields, contain high concentrations of triclosan, impacting terrestrial microbes as well. These impacts have not been assessed in the ecological risk assessment completed by EPA.

Triclosan Promotes Bacterial Resistance

Triclosan's widespread use poses a secondary public health risk that EPA has not evaluated in its risk assessment. Widespread triclosan use has led to bacterial resistance to triclosan and cross-resistance to antibiotics. EPA-registered products with triclosan, such as cutting boards, sponges, counter tops etc., expose bacteria to long-term low levels of triclosan. Resistance effects have been shown at low, bacteriostatic and sub-biocidal levels. Resistant strains of *Escherichia coli* (E. coli) and *Salmonella enterica*

have already been identified.

Triclosan Degradates Have Not Been Evaluated

Triclosan, when in water and exposed to sunlight, degrades and forms toxic compounds. These compounds include dioxins, 2,4-dichlorophenol and other similar compounds. Dioxins are known to be carcinogenic and persistent, while 2,4-dichlorophenol is listed in the European Union as a potential endocrine disruptor and is an EPA priority pollutant. Methyl triclosan, another degradate, bioaccumulates in fish and other aquatic organisms. Triclosan can also interact with free chlorine in tap water to form the carcinogenic compound chloroform. EPA has not considered these byproducts in its analysis of triclosan.

Regulatory Gaps Continue

FDA has responsibility for regulating many personal care and cosmetic products. However, certain dishwashing liquids contain the antibacterial triclosan, and labels state that the intended purpose of triclosan is for use on hands. Despite joint jurisdiction between EPA and FDA, neither agency has evaluated the effects of triclosan in dishwashing liquid, especially residues left on dishes and food. EPA has a responsibility to evaluate the health impacts associated with short and long-term dermal and oral exposures, as well as environmental impacts once it is washed down the drain.

Other products containing triclosan are apparently exempt from full EPA evaluation because of claims to only protect the treated article itself. This accounts for a large proportion of products such as hair accessories, yoga mats and sport equipment, that have gone unregulated, while the use patterns of these products undoubtedly lead to human exposures which have not been assessed.

Conclusion

EPA's review of triclosan reveals several significant issues that have not been fully evaluated or have simply been ignored. Triclosan's impact on the environment, especially as it concerns bacterial resistance and the resulting consequences it may have in a medical setting are too great to be ignored. Its pervasive presence in the nation's waterways and in human beings demonstrates the ability of this chemical to be persistent and bioaccumulative. The hazards posed by its degradates are greater than the parent compound itself, but have gone mostly unchecked. Since it has been shown that the use of the antibacterial triclosan is no more effective than soap and water for handwashing, human exposure to triclosan is not only unnecessary but risky and should not be allowed to continue wreaking havoc on the environment.

A cited version of this article, as well as the complete text of the comment submitted to EPA can be found at www.beyondpesticides.org/antibacterial.