

The Trouble With Triclosan

Target: Antimicrobial Pesticides
Going 'Down the Drain'

Pretreatment and Source Control - Providing the
Foundation for Clean Water's Future.

NACWA's 2009 National Pretreatment and Pollution
Prevention Workshop.
Charlotte, North Carolina

March 25-27, 2009

Nichelle Harriott
Beyond Pesticides
Washington DC



What is Triclosan?

- Triclosan is an antimicrobial pesticide currently being used in many household and personal care antibacterial products.
- Ciba invented triclosan in the 1960's and by 1972, the company introduced triclosan to the consumer market where it was confined for the most part to health care settings.



Drug Facts	
Active ingredients	Purpose
Sodium fluoride 0.24% (0.14% w/v fluoride ion).....	Anticavity
Triclosan 0.30%.....	Antigingivitis
Uses aids in the prevention of: • cavities • plaque • gingivitis	
Warnings Keep out of the reach of children under 6 years of age. If more than used for brushing is accidentally swallowed, get medical help or contact a Poison Control Center right away.	
Directions supervise children as necessary until capable of using without supervision.	

Drug
adults a
years of
children
children
Antipla
Inacti
PVM/MA
sodium
FD&C bl



What is Triclosan?

- Triclosan is now in hundreds of consumer products ranging from antibacterial soaps, deodorants, toothpastes, cosmetics, fabrics, toys, and other household and personal care products.
- It is expected to have a market value of \$1billion in 2009.
- Most of these products are washed down the drain, can persist through wastewater treatment, and make their way into waterways.



What is the Problem with Triclosan?

Human Health Concerns

- The increased use of antibacterials has been linked to increased allergies in children (*Levy, 2001; Bremner et al., 2003*).
- New laboratory studies on rats show that triclosan can disrupt thyroid hormone, alter development and impair important functions at the cellular level (*Zorilla et al., 2008; Crofton et al., 2007*).



What is the Problem with Triclosan?

Human Health Concerns

- Triclosan has become so common that it has shown up in blood and breast milk (*Allmyr et al., 2006*; *Adolfsson et al., 2002*).
- According to the CDC, triclosan is found in the urine of 75% of the U.S. population (*Calafat et al., 2008*).
- Indoor dust samples found triclosan present in all samples of dust from private homes, and in surprisingly large amounts (*Canosa, 2007*).



What is the Problem with Triclosan?

Impacts on Wildlife

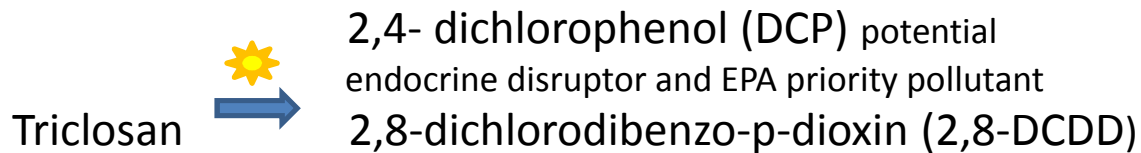


- Triclosan is especially toxic to aquatic life including algae, phytoplankton, and others like the *Daphnia magna* (Wilson, 2003; DeLorenzo, 2008; Yang, 2008).
- Studies have found that its metabolites accumulate in fish and earthworms (Balmer *et al.*, 2004; Kinney, 2008).
- Triclosan disrupts thyroid hormone-associated gene expression in the North American bullfrog (Veldhoen *et al.*, 2006).

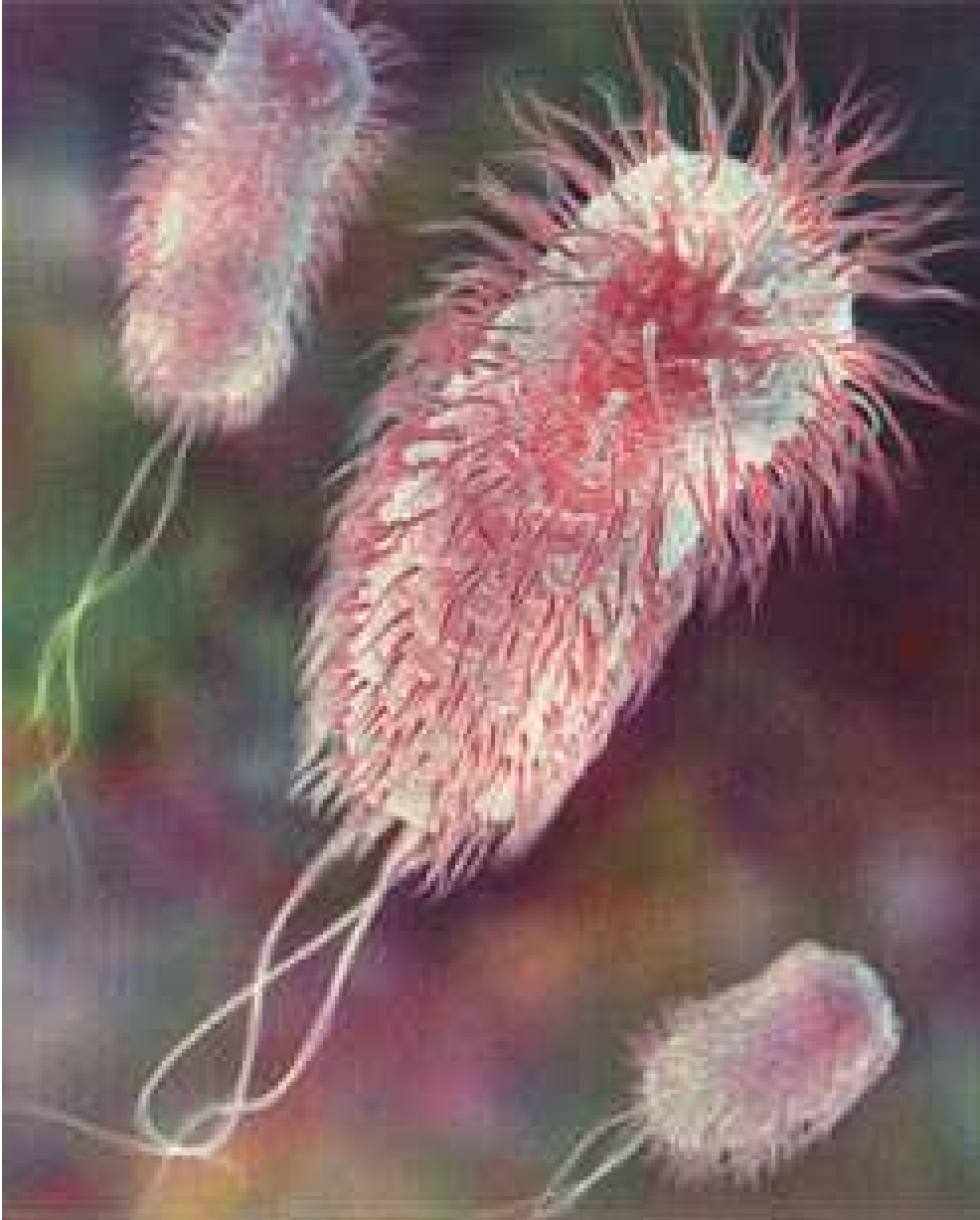
What is the Problem with Triclosan?

Environmental Fate

- U.S. Geological Survey (2002) study of 95 different organic wastewater contaminants in U.S. streams, triclosan was one of the most frequently detected compounds and at some of the highest concentrations.
- When in water and exposed to sunlight, triclosan transforms into highly toxic compounds (*Aranami, 2007; Lores, 2005; EPA 2008*).
- Other degrades and transformation products:
 - 2,4,6-trichlorophenol*** (2,4,6-TCP): a carcinogen, endocrine disruptor.
 - Chloroform***: a carcinogen.
 - Methyl Triclosan***: a bioaccumulative and persistent metabolite of triclosan



What is the Problem with Triclosan?



Bacterial Resistance

- Triclosan creates more potent strains of bacteria, increasing antibacterial and antibiotic resistance. This means that infections would become more and more difficult to treat (*Levy, 2001, 2002; Yazdankha, 2006*).
- Some researchers have hypothesized that widespread surface antimicrobial use may help to explain the unexpected appearance of a different kind of methicillin-resistant *Staphylococcus aureus* (MRSA) and other strains (*Levy, 2002; Schmid and Kaplan, 2004*).

What is the Problem with Triclosan?



False Efficacy Claims

- Soaps that contain triclosan have not been proven to be more effective in preventing normal household illnesses than ordinary soap and water.
- In 2005, an FDA advisory panel of experts voted 11 to 1 that antibacterial soaps were no more effective than regular soap and water in fighting infections.

"No data exist to support their efficacy when used in such products or any need for them"...American Medical Association (AMA) (2000)



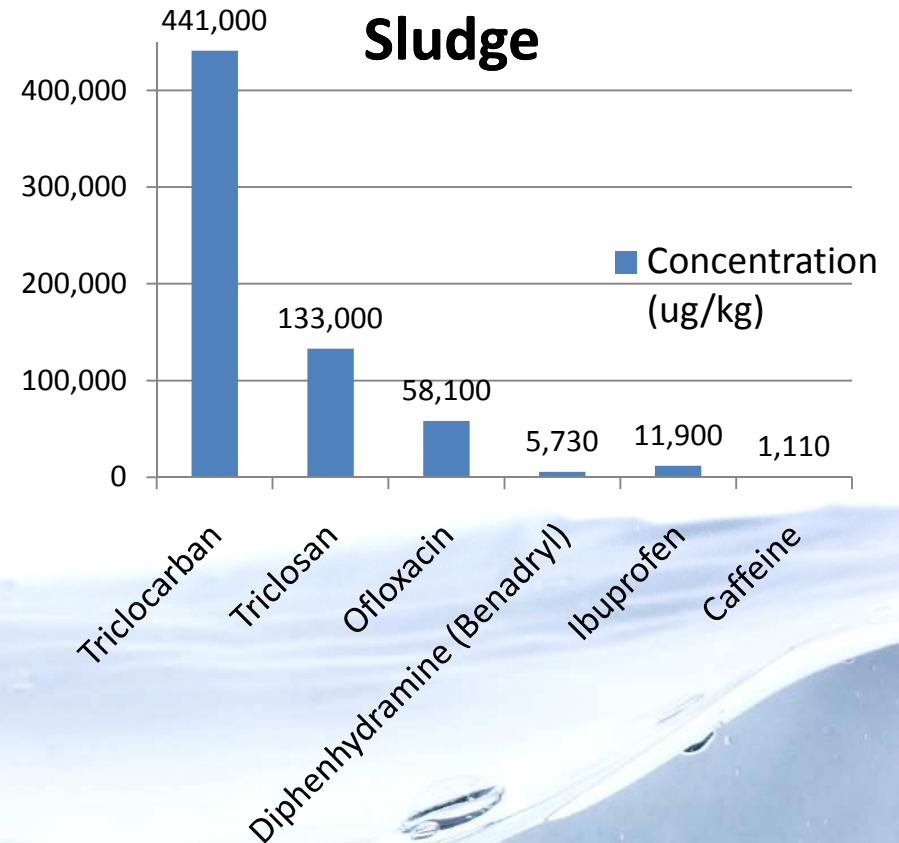
Triclosan and Wastewater Treatment

- Triclosan is not completely removed from wastewater (*Heidler and Halden, 2007*).
- Sewer overflows and wastewater effluent deposits both contribute to triclosan contamination of waterways .
- Triclosan accumulates and persists in sewage sludge .
- Triclosan has been detected in runoff from sewage treated fields as long as 266 days after the application (*Topp et al., 2008*).





Pharmaceuticals in Sewage Sludge



- EPA's Targeted National Sewage Sludge Survey (TNSSS) (2009) detected triclosan in 79 out of 84 (94%) sewage sludge samples collected from POTWs around the U.S.

- High concentrations of antimicrobials were found. Triclosan is second only to its cousin triclocarban.

Triclosan In The Terrestrial Environment

- Triclosan contaminated sludge is often recycled on agricultural fields.
- It is still unknown whether triclosan can contaminate food crops.
- Bioaccumulation in earthworms and fish indicates it has entered the food web.



Inadequate Regulation

- Both the Environmental Protection Agency (EPA) and Food and Drug Administration (FDA) have some responsibility for regulating the marketing claims companies make about products containing triclosan.

Unfortunately, neither agency restricts use of the chemical in consumer products.

- In 2008, EPA found that triclosan was eligible for reregistration, despite overwhelming evidence of its impacts on human and environmental health.

However, the agency recognizes research is ongoing and will review the chemical again in 2013.



What Can Be Done!

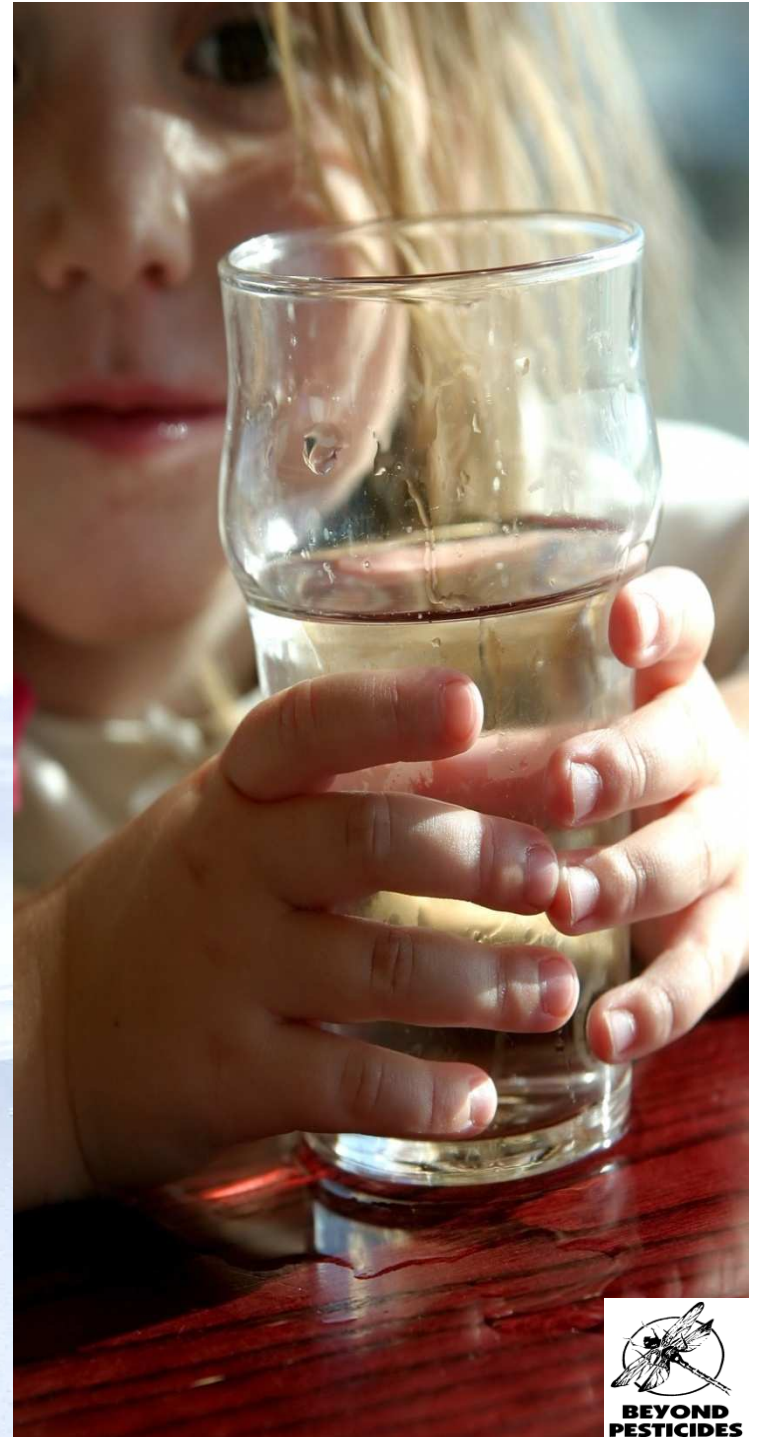
In the absence of adequate and timely regulatory attention to issues of health and environmental protection, Beyond Pesticides and Food and Water Watch have undertaken a campaign to:

Educate

- i. Educate consumers about the dangers associated with using triclosan-containing products.
- ii. Encourage use of alternatives, e.g. alcohol-based sanitizers, or plain soap and water!

Regulate

- i. Urge the FDA and EPA to cancel the non-medical uses of triclosan.
- ii. Urge local and state jurisdictions to ban the non-medical uses of triclosan.
- iii. Work with local governments, school districts and parent organizations across the country that are focused on restricting pesticides and adopting alternative management strategies.



What Can Be Done!

Co-operate

- i. Collaborate with the medical care community because widespread consumer use of triclosan reduces its effectiveness in medical care facilities.
- ii. Continue to work with other environmental and public health institutions to help educate the public on the dangers associated with triclosan use.
- iii. Elevate involvement of water treatment utilities.
- iv. Continue to build a strong coalition of safe cosmetics and consumer protection groups across the country.



Eventualities

- Finding of unacceptable levels of triclosan in humans and waters based on risk determinations.
- Restrictions on use to limit human and environmental exposures; restriction of levels in water, food and the environment.
- Adoption of new technologies to monitor and limit triclosan in the environment.
- Eventual cancellation of triclosan registrations.



Thank You

