

# Rachel's Environment & Health News

## #658 - PVC and the Breasts of Mothers

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Wow! Last week the Science and Environmental Health Network (SEHN) brought us THE PRECAUTIONARY PRINCIPLE IN ACTION: A HANDBOOK, and this week they bring us a full-length book just published by Island Press: PROTECTING PUBLIC HEALTH & THE ENVIRONMENT: IMPLEMENTING THE PRECAUTIONARY PRINCIPLE.[1] (To order the book from Island Press, telephone 1-800-828-1302 --well worth the \$30 price.)

Carolyn Raffensperger, the North Dakota dynamo who powers SEHN, seems to be everywhere at once. Last week she traveled to the White House, invited to make a presentation about the precautionary principle. We take this as further evidence that American industry is in a panic over this new way of making environmental decisions. Perhaps they are hoping Al Gore can coopt and "cool out" these precautionary upstarts and get things back onto the risk assessment track where they belong. We suspect Mr. Gore -- who talks a good game but whose actions have proven him an untrustworthy friend of the environment -- will do his best to give chemical corporations what they want.

SEHN's new book-length anthology will satisfy anyone who wants to know the history of the precautionary principle, where it fits into environmental law, how it has developed in Europe, and how the principle can be applied in many different settings. SEHN's book is deep and rewarding, at once philosophical and factual, a thoroughly satisfying volume.

Best of all, there is a special reward at the end of the book --a wonderful little essay by Sandra Steingraber, our favorite environmental writer (see REHW #565). Here, with permission from Island Press, is that essay verbatim:

Why the Precautionary Principle? A Meditation on Polyvinyl Chloride (PVC) and the Breasts of Mothers

by Sandra Steingraber[2]

Those of you who know me know that when I talk on these topics I usually speak out of two identities: biologist and cancer activist. My diagnosis with bladder cancer at age 20 makes more urgent my scientific research. Conversely, my Ph.D. in ecology informs my understanding of how and why I became a cancer patient in the first place: bladder cancer is considered a quintessential environmental disease. Links between environment and public health became the topic of my third book, LIVING DOWNSTREAM, but since I have been given the task of speaking about the effect of toxic materials on future generations, I'm going to speak out of another one of my identities -- that of a mother.

I'm a very new mother. I gave birth in September 1998 to my daughter and first child. So, I'm going to speak very intimately and in the present tense. You know it's a very powerful thing for a person with a cancer history to have a child. It's a very long commitment for those of us unaccustomed to looking far into the future. My daughter's name is Faith.

I'm also learning what all parents must learn, which is a new kind of love. It's a love that's more than an emotion or a feeling. It's a deep physical craving like hunger or thirst. It's the realization that you would lay down your life for this eight-pound person without a second thought. You would pick up arms for them. You would empty your bank account. It's love without boundaries and were this kind of love directed at another adult, it would be considered totally inappropriate. A kind of fatal attraction. Maybe, when directed at babies, we should call this "natal attraction."

I say this to remind us all what is at stake. If we would die or kill for our children, wouldn't we do anything within our power to keep toxics out of their food supply? Especially if we knew, in fact, there were alternatives to these toxics?

Of all human food, breast milk is now the most contaminated.

Because it is one rung up on the food chain higher than the foods we adults eat, the trace amounts of toxic residues carried into mothers' bodies become even more concentrated in the milk their breasts produce. To be specific, it's about 10 to 100 times more contaminated with dioxins than the next highest level of stuff on the human food chain, which are animal-derived fats in dairy, meat, eggs, and fish. This is why a breast-fed infant receives its so-called "safe" lifetime limit of dioxin in the first six months of drinking breast milk. Study after study also shows that the concentration of carcinogens in human breast milk declines steadily as nursing continues. Thus the protective effect of breast feeding on the mother appears to be a direct result of downloading a lifelong burden of carcinogens from her breasts into the tiny body of her infant.

When it comes to the production, use, and disposal of PVC [polyvinyl chloride plastic], the breasts of breast-feeding mothers are the tailpipe. Representatives from the vinyl industry emphasize how common a material PVC is, and they are correct. It is found in medical products, toys, food packaging, and vinyl siding. What they don't say is that sooner or later all of these products are tossed into the trash, and here in New England, we tend to shovel our trash into incinerators. Incinerators are de facto laboratories for dioxin manufacture, and PVC is the main ingredient in this process. The dioxin created by the burning of PVC drifts from the stacks of these incinerators, attaches to dust particles in the atmosphere, and eventually sifts down to Earth as either dry deposition or in rain drops. This deposition then coats crops and other plants, which are eaten by cows, chickens, and hogs. Or, alternatively, it's rained into rivers and lakes and insinuates itself into the flesh of fish. As a breast-feeding mother, I take these molecules into my body and distill them in my breast tissue. This is done through a process through which fat globules from throughout my whole body are mobilized and carried into the breast lobes, where, under the direction of a pituitary hormone called prolactin, they are made into human milk. Then, under the direction of another pituitary hormone called oxytocin, this milk springs from the grape-like lobes and flows down long tubules into the nipple, which is a kind of sieve, and into the back of the throat of the breast-feeding infant. My daughter.

So, this, then, is the connection. This milk, my milk, contains dioxins from old vinyl siding, discarded window blinds, junked toys, and used I.V. bags. Plastic parts of buildings that were burned down accidentally are also housed in my breasts. These are indisputable facts. They are facts that we scientists are not arguing about. What we do spend a lot of time debating is what exactly are the health effects on the generation of children that my daughter belongs to. We don't know with certainty because these kids have not reached the age at which a lot of diseases possibly linked to dioxin exposure would manifest themselves. Unlike mice and rats, we have long generational times. We do know with certainty that childhood cancers are on the rise, and indeed they are rising faster than adult cancers. We don't have any official explanation for that yet.

Let me tell you something else I've learned about breast feeding. It's an ecstatic experience. The same hormone (oxytocin) that allows milk to flow from the back of the chest wall into the nipple also controls female orgasm. This so-called let-down reflex makes the breast feel very warm and full and fizzy, as if it were a shaken-up Coke bottle. That's not unpleasant. Moreover, the mouths of infants -- their gums, tongues, and palates -- are perfectly designed to receive this milk. A newborn's mouth and a woman's nipple are like partners in a tango. The most expensive breast pump -- and I have a \$500 one -- can only extract about half of the volume that a newborn baby can because such machines cannot possibly imitate the intimate and exquisite tonguing, sucking, and gumming motion that infants use to extract milk from the nipple, which is not unpleasant either.

Through this ecstatic dance, the breast-fed infant receives not just calories, but antibodies. Indeed the immune system is developed through the process of breast feeding, which is why breast-fed

infants have fewer bouts of infectious diseases than bottle-fed babies. In fact, the milk produced in the first few days after birth is almost all immunological in function. This early milk is not white at all but clear and sticky and is called colostrum. Then, from colostrum you move to what's called transitional milk, which is very fatty and looks like liquid butter. Presumably then, transitional milk is even more contaminated than mature milk, which comes in at about two weeks post-partum. Interestingly, breast milk is so completely digested that the feces of breast-fed babies doesn't even smell bad. It has the odor of warm yogurt and the color of French mustard. By contrast, the excretions of babies fed on formula are notoriously unpleasant.

What is the price for the many benefits of breast milk? We don't yet know. However, one recent Dutch study found that schoolchildren who were breast fed as babies had three times the level of PCBs in their blood as compared to children who had been exclusively formula fed. PCBs are probably carcinogens. Why should there be any price for breast feeding? It should be a zero-risk activity.

If there was ever a need to invoke the Precautionary Principle --the idea that we must protect human life from possible toxic danger well in advance of scientific proof about that danger --it is here, deep inside the chest walls of nursing mothers where capillaries carry fat globules into the milk-producing lobes of the mammary gland. Not only do we know little about the long-term health effects of dioxin and PCB exposure in newborns, we haven't even identified all the thousands of constituent elements in breast milk that these contaminants might act on. For example, in 1997 researchers described 130 different sugars unique to human milk. Called oligosaccharides, these sugars are not digested but function instead to protect the infant from infection by binding tightly to intestinal pathogens. Additionally, they appear to serve as a source of sialic acid, which is essential to brain development.

Most recently, Swedish researchers discovered powerful anti-cancer proteins in breast milk. Activated by stomach acids, they appear to enhance cell suicide in defective cells, which is one way our own bodies protect us from developing cancer.[3]

So, this is my conclusion. Breast feeding is a sacred act. It is a holy thing. To talk about breast feeding versus bottle feeding, to weigh the known risks of infectious diseases against the possible risks of childhood or adult cancers is an obscene argument. Those of us who are advocates for women and children and those of us who are parents of any kind need to become advocates for uncontaminated breast milk. A woman's body is the first environment. If there are toxic materials from PVC in the breasts of women, then it becomes our moral imperative to solve the problem. If alternatives to PVC exist, then it becomes morally imperative that we embrace the alternatives and make them a reality.

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[1] Carolyn Raffensperger and Joel Tickner, editors, PROTECTING PUBLIC HEALTH & THE ENVIRONMENT: IMPLEMENTING THE PRECAUTIONARY PRINCIPLE (Washington, D.C.: Island Press, 1999). \$30.00. ISBN 1-55963-688-2. Telephone 1-800-828-1302.

[2] Sandra Steingraber, poet, writer, biologist, and cancer survivor, lives in Ithaca, N.Y.

[3] C. Kohler and others, "Protease activation in apoptosis induced by MAL," EXPERIMENTAL CELL RESEARCH Vol. 249, No. 2 (June 15, 1999), pgs. 260-268.

Descriptor terms: breast milk; food safety; dioxin; pvc; chlorine; plastics; precautionary principle; science and environmental health network; sehn; book reviews;