What's in Your Green Tea?

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Hope Nemiroff thought she was living the healthiest lifestyle possible. After being diagnosed with cancer in 1995 and having a tiny tumor removed from her breast, she had changed her ways. She walked. She went for hypnosis and did yoga to help reduce her stress levels. She switched to a mostly organic, vegetable-based diet. She drank a dozen cups of green tea every day.

an advocacy group in New York. Impressed by her efforts, her oncologist hired her to help with a study of the relationship between DDT and breast cancer. Although she was not a subject of the study, Nemiroff says, "I got curious. I wanted to see what [the blood] of somebody like me would look like who was living a healthy lifestyle."

Her blood, it turned out, contained traces of DDT. And when she later investigated what part of her diet might be contaminated with the pesticide, the answer jolted her. A laboratory analysis found DDT in her green tea.

Determined to learn everything she could about her disease, Nemiroff, now 58, also became president of the Mid-Hudson Breast Health Action Project, (now called Breast Cancer Options), This finding was especially shocking because green tea has become the unofficial beverage of choice for breast cancer survivors. Both laboratory science and low breast cancer rates in Japan, a land of green-tea drinkers, suggest that substances in the tea might play a role in preventing breast cancer. Tea manufacturers have capitalized on those theories, labeling their boxes with statements like "Ancient Healing Formula Teas with Organic Ingredients" (The Yogi Tea Company) or noting the presence of anti-oxidants that "help neutralize free radicals ... molecules which can damage cells" (Lipton). While overall tea sales in the United States have remained flat during the past decade, cancer concern has propelled the wholesale value of green tea consumed here from $2 million in 1990 to $25 million in 1999.

Andrea Barrist Stern DDT, on the other hand, is a synonym for environmental poison. It is the pesticide that was banned by the United States in 1972, 10 years after publication of Rachel Carson^s landmark book, Silent Spring.

Carson exposed the pesticide as a terminator, a man-made plague that wiped out populations of songbirds, trout and salmon, killing them outright or rendering them sterile. Introduced to the world during World War II as a public health measure to kill body lice and mosquitoes, DDT was sprayed with abandon for decades by government agencies and a trusting public who never suspected it would remain in the environment long afterward. Many now believe that exposure to DDT is a cause of cancer. Carson herself endured a radical mastectomy while writing Silent Spring, and she died of breast cancer two years after the book was published Finding DDT in Nemiroff^s tea raises a number of urgent questions: Was the finding an isolated case? How did

it get there? Did the DDT threaten Nemiroff^s health, that of other breast cancer survivors, or other American consumers? Should people stop drinking green tea?

An In These Times investigation has found that Nemiroff^s contaminated tea was clearly not an isolated or rare case. In These Times purchased 10 boxes of different brands of green tea at a suburban New York supermarket and health food store, and had them analyzed by Toxicology International of Fairfax, Virginia. Analysis of the tea samples showed that two of the 10 brands were contaminated with DDT, in violation of Environmental Protection Agency rules. The one with the highest levels was produced by the Yogi Tea Company, and included the herbs echinacea and kombucha. However, a new sample of Alvita Chinese Green Tea, the brand Nemiroff had been drinking, showed no traces of DDT.

In addition, five of the tea samples contained chlorpyrifos, also known as Dursban, which the EPA banned from consumer products last June because of its health risk, particularly to children. Chlorpyrifos is an organochlorine, putting it in the same chemical family as DDT. Under its recent action, the EPA reduced the allowable residues of chlorpyrifos in many fruits and vegetables. But tea is not supposed to contain any of the pesticide, making any amount of it an illegal adulteration.

These test results mean that consumers can have no assurance that green tea - or any tea made from leaves of the camellia sinensis plant - is free of pesticide contamination. But the importance of the findings, say experts informed of the test results, is that they show the widespread contamination of our food supply and the environment.

The pesticides were found in tiny amounts, in parts per billion, and pose no imminent health danger. DDT accumulates in our bodies and is carried in breast tissue, so ingesting contaminated tea is certainly undesirable. But the experts say that the benefits of drinking green tea probably outweigh the risks.

How did the DDT get in the tea? Surprise: DDT is still being manufactured in China and India and used in more than two dozen Third World countries in Africa and Asia. China is the source of most of the green tea imported into the United States. Finding DDT in tea imported from China would not surprise Janice Jensen, a senior environmental chemist in the EPA^s Office of Pesticide Programs. "They^re still producing DDT in China," she says, "and there is still some use of DDT there. DDT is caught in the atmosphere, and can be redeposited far from its use site - that^s one of the arguments for the global treaty on persistent organic pollutants."

This proposed international treaty is the focus of intensive efforts by the United Nations and environmental organizations, and it is still being negotiated. (The United States government says it supports the treaty, but environmentalists have criticized U.S. efforts to water down provisions that they and the European Union support.) The overall goal is to reduce the use of, or eliminate entirely, 12 particularly hazardous chemicals called "persistent organic pollutants," or POPs, including DDT. But several developing countries are balking at a DDT ban because until effective and affordable alternatives are available it is their best weapon against mosquitoes that transmit malaria, one of the world^s top public health problems. Although environmentalists urge the use of safer alternatives, DDT is cheap and readily available. The affected countries simply cannot afford other control methods, and the United States has not made combating malaria a top spending priority.

But it turns out that the actions of people in China and Africa, taken to protect their health from an immediate and deadly threat, have a direct impact on the purity of the American food supply.

According to Clifton Curtis, director of the World Wildlife Fund^s Global Toxics Initiative, "DDT is such a potent chemical that as long as it is used anywhere in the world, nobody is safe."

Six billion pounds of DDT have been produced and used since its introduction in 1942, more than any other pesticide. In years past, it was sprayed, often in a sticky oil mixture, on farmlands, forests, rivers, estuaries and even the Long Island suburbs of New York City (which today have very high rates of breast cancer). The purpose of that suburban spraying effort was to wipe out the gypsy moth, and it was a failure; the insects periodically re-appear in the Northeast in numbers so large that you can hear them eating the oak trees bare.

Because DDT persists in the environment for decades, it is literally everywhere and in everybody. The average level of the pesticide in human fat is seven parts per million. DDT and its metabolite, DDE, have been found in every sample of breast milk tested, from the Arctic to South Africa - where children receive DDT in their mothers^ milk at rates five to 18 times higher than recommended by the World Health Organization. The fact that the WHO even has calculated an "acceptable" daily intake of DDT testifies to the extent of DDT pollution.

In the United States, a 1992-1993 study by the Food and Drug Administration found that 5.6 percent of commonly consumed fruits and vegetables that it tested were contaminated with illegal pesticides. Todd Hettenbach, a pesticide policy analyst with the Environmental Working Group, says that even crops grown in the United States, where DDT use stopped almost 30 years ago, continue to show DDT contamination. Squash and root crops like carrots are a particular concern, he says.

With imported food, the situation is worse. A 1994 report to Congress on food safety by the General Accounting Office (GAO) noted that countries which export food to the United States need not, except in the case of meat and poultry, have monitoring systems equivalent to ours, and that U.S. agencies often lack information on chemicals used by exporting countries.

Richard Liroff, director of the World Wildlife Fund^s Alternatives to DDT Project, says his organization had queried the Chinese government to find out how much DDT is both produced and used there. "We got no response," he says, adding, "Even though it is widely believed that there is diversion [of DDT intended for public health purposes] to agriculture, we have nothing more than anecdotal evidence."

Technically, EPA rules make the presence of any DDT in food illegal. But recognizing the reality of worldwide contamination, the agency has set "action" levels for the presence of DDT in meat, fruits and vegetables. These levels are in parts per million, amounts far higher than those found in the tea. Only when the action levels are exceeded do either the U.S. Department of Agriculture or FDA take steps to find the source of the DDT and try to retrieve the food before it gets to market.

In 1994 the GAO reported that 3 percent of the imported food shipments tested by the FDA contained prohibited pesticides. It said that even when detected, about one-third of the contaminated food probably found its way to store shelves. "It is very hard to seize contaminated products once they leave the border, very hard to track them down," says Jay Feldman of the National Coalition Against the Misuse of Pesticides.

Devra Lee Davis, an epidemiologist and toxicologist who was a presidential appointee to a government chemical safety board, says that "having been in the government, I understand that this is too big a problem for the government to solve. It will take the private sector organizing

itself to provide assurance to the public" that imported food is pesticide-free by testing their products. The Environmental Working Group has suggested that food importers adopt an approach to food safety that would establish critical control points for quality testing. The private sector would do the testing, and the FDA would police that process.

But tea manufacturers insist they do test. "This is the first time anyone has found anything in our tea," says Jagat Joti Khalsa, director of communications for Yogi Tea, upon learning the results of the tea analysis. He describes a systematic and elaborate process of constant testing of tea and herbs bought from 40 or 50 vendors, which he says costs the company more than 5 percent of its profit margin. Most of the company^s green tea, he says, comes from organic tea estates, primarily in India.

The other tea contaminated with DDT was Stash Premium Green Tea. Joy Edlund, a spokeswoman for Stash, calls the finding "really strange." She says the company^s premium green tea is grown in Brazil on virgin land never before used for agriculture, "so DDT was never used on it." She adds that the company^s farming practices are so natural that it has been contemplating marketing the tea as organic. She says Stash does not test its tea for purity itself; they import the tea from Brazil.

Both Edlund and Khalsa asked for the tea used in the tests to be sent to them for their own analysis.

Among many breast cancer activists and some scientists, there is a strong belief that past and present small-scale exposure to DDT is the cause of at least some breast, prostate and other kinds of cancer. But not all the evidence is clear. A 1993 study showed that women with malignant breast cancer had higher blood levels of DDT than women without the disease, but it has been difficult to really nail down cause and effect. A May 1994 toxicological profile of the chemical prepared for the U.S. Public Health Service noted that studies of workers exposed to DDT in the workplace "do not indicate conclusively an association" between DDT exposure and cancer.

Yet the same document notes that studies "suggest that DDT may cause damage to human chromosomes" and that studies in rats show it to have "estrogen-like" effects. This is of particular concern because one of the few generally accepted risk factors for breast cancer is exposure to estrogen or estrogen-mimicking substances, called xenoestrogens. Studies show that estrogen and xenoestrogens bind with receptors in mammary glands, and in the lab xenoestrogens have been shown to make human breast cancer cells grow. The longer a woman is exposed to estrogen - either naturally, through early menstruation or late menopause, or, it is theorized, from exposure to estrogen-mimickers - the higher her risk of breast cancer.

It is on the basis of its estrogenic properties that Janette Sherman, a physician and author of Life^s Delicate Balance: Causes and Prevention of Breast Cancer, is convinced that DDT is a cause of that disease. "You [eat] one part per billion today," she says, "and one tomorrow, and at the end of the month you have 30 parts - these chemicals accumulate in the fat. DDT breaks down into DDE, which has been shown to be estrogenic in multiple animal tests going back to the ^60s." She adds: "It^s nice to call [the studies] equivocal, but it^s not that way at all."

Because she knew about these studies, Hope Nemiroff decided to act after her blood test showed higher than average levels of DDT. She spent 22 days undergoing a detoxification regimen designed to purge chemical poisons from the body. The regimen included a run followed by more than four hours a day of sweating in a relatively low-temperature sauna. The

regimen seemed to work. Her DDT blood levels fell from 0.9 parts per billion before the regimen to 0.3 parts per billion after.

But six months later - during which time she had been eating her organic diet and drinking green tea-she was rocked by the results of another blood test: Her DDT levels had risen to 1.1 parts per billion. When a test of her water found it clear, she had the tea tested and discovered that it was, indeed, contaminated.

Should people stop drinking green tea because of these findings? Green tea is no different from other teas in that it comes from the camellia sinensis plant, which grows best in the tropics at high altitude, where the days are warm, rain is ample, and the nights are cool. What makes the final product green tea, as opposed to black tea, is only the manner of processing. Black tea leaves are subjected to a period of high heat and humidity, during which the tea oxidizes and turns from green to brown. Leaves for green tea are subjected to a shorter or somewhat different heating process. As a result, green tea retains a class of chemicals called catechins, which may play a role in cancer prevention and be part of the explanation for lower breast cancer rates in Japan.

Davis, who has written extensively on breast cancer and the environment and expects to publish Nemiroff^s case in a scientific journal, did not advise her to stop drinking green tea. Davis would not recommend other women give up the beverage either. "There is a lot of benefit to drinking green tea that has been shown experimentally," she says.

Sherman, author of books on breast cancer and chemical exposure, agrees that people should not stop drinking potentially beneficial green tea because of the DDT findings. What those results illustrate, she says, "is that our entire food supply is now contaminated worldwide because of massive use of pesticides."

As Nemiroff has done, consumers can try to avoid drinking pesticides in their tea by switching to brands certified as organic, although this is not an absolute guarantee of purity. Eating organically grown fruits and vegetables - which are more expensive than non-organic - can also help minimize pesticide exposure. Losing weight also releases pesticide residues stored in fat, eliminating them from the body.

But Nemiroff^s story illustrates that it is virtually impossible to completely avoid food contaminated with pesticides even when someone goes out of her way to try. Pesticides, wrote Carson three decades ago, are "as crude a weapon as the cave man^s club," a chemical barrage "hurled against the fabric of life."

"The contamination of our world," she continued, "is not alone a matter of mass spraying. Indeed, for most of us this is of less importance than the innumerable small-scale exposures to which we are subjected day by day, year after year. Like the constant dripping of water that in turn wears away the hardest stone, this birth-to-death contact with dangerous chemicals may in the end prove disastrous."