Dioxin—It's Everywhere Poison in Air, Soil, Food Stirs Anxiety in Oroville; [Home Edition]
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PHOTO: [Herb Lightle], left, with coop that held chickens found to have a high level of dioxin. Norma Prince and [Kaylynn Newhart], above right, with map of smoke plume's path. / ALLEN QUINN; PHOTO: A graffiti message on a Koppers Co. crane working near lumber plant in Oroville.

Residents realized they were in for trouble when an early morning explosion shook the Koppers Co. wood-treatment plant south of Oroville, pushing up a tower of acrid black smoke that burned their lungs and blistered their skin.

When small but unhealthy traces of the toxic material dioxin turned up a few months later in locally produced eggs, chickens and beef, they realized the problem was not going to go away.

Nothing, however, matched the outcry last week after a 42-year-old woman active in a residents' cleanup campaign collapsed and died unexpectedly at the door of Oroville Hospital's emergency room.

State and county medical officials discount the possibility that Elaine Brooks' death, apparently caused by a blood clot in a lung, is related to the contamination of her family's small ranch south of the city.

Those same doctors, however, know so little about the dioxin contamination of the area—and about the effects of dioxin itself, a toxin found in Agent Orange and blamed by many Vietnam veterans for a variety of disorders, from cancer to birth defects—that the physicians' assurances only fueled the controversy they sought to quell.

Everyone knows there are poisons on the ground in Oroville, and poisons in the air; poisons in the animals and poisons in the produce. But no one is sure how the poisons got there, how dangerous they are or even how widespread the contamination is. Scientists who tried to map out the extent of the pollution ran out of patience and money before they ran out of dioxin.

"Everywhere we've looked, we've found it," said Dr. Lynn Goldman, the state Department of Health Services epidemiologist in charge of the probe. "But like so many other aspects of the case, we don't know how to interpret that."

The story has many beginnings, from the conversion of the plant in the late 1940s from a lumber mill into a wood-treatment factory, to a 1963 fire that may have been the factory's first major airborne dioxin release, to the discovery in the early 1980s that the plant had so badly polluted local well water that it qualified for the federal government's Superfund list of the country's worst toxic-waste problems.

The most recent beginning, though, was the April 6, 1987, fire that led to the discovery of what the state Health Services Department describes as unusually high and potentially unhealthy levels of dioxins dispersed widely in the local environment.

Outdoorsman's Mecca

It is a tragically ironic affliction for a logging and farm city 60 miles north of Sacramento that considers itself an outdoorsman's mecca. Boosters proudly note that the city of 11,000 sits between Sacramento Valley wetlands and Northern Sierra forests, with Lake Oroville for a swimming hole.

"This (contamination) is not the kind of thing people expect when they move to the country, buy a house and decide they're going to grow all of their food organically and live off the land," Goldman said. "All of a sudden, they find that they're dealing with a contamination problem none of us really understand."

The Koppers Co. fire began when a worker mistakenly spilled a mixture of liquid butane and pentachlorophenol, a wood preservative commonly referred to as penta. The mixture was used to
pressure-treat telephone poles, enabling them to resist rot and insects without a coat of gooey oil or creosote.
The butane exploded in flames, slightly injuring one worker and buckling open a nearby storage silo filled with dry penta. The fire started at 6 a.m. and burned into the early afternoon. At first, the company said 9,000 pounds of pentachlorophenol was burned in the fire; now plant engineer Steve Smith estimates the amount burned at fewer than 2,000 pounds. Goldman estimated that at least 6,000 pounds burned. The number is important because the preservative, which usually contains dioxin as a manufacturing byproduct, also produces dioxin when it burns.
State health officials came to the area immediately to assess the impact of the fire, questioning plant managers and local residents, and within a month collecting eggs for later analysis. For some reason, the results of that analysis were not released until March of this year. They showed unusually high levels of dioxins in the yolks—9.8 parts per trillion, nearly 100 times the barely measurable level in eggs bought at a San Francisco Bay Area supermarket.
Subsequent tests, in March and April of this year, showed even higher levels—up to 30 parts per trillion in eggs, 39 parts per trillion in beef, and up to 358 parts per trillion in the fatty tissues of the chickens running around Ruth and Herb Lightle's back yard. Blood samples were taken from the Lightles and their three children in April, but the state lacks laboratory resources and money to conduct the gas chromatograph mass spectrometer tests needed to assay them. Such tests cost $1,500 apiece, Goldman said.
Soil in the area was also tainted, tests showed. Dirt samples around the Lightles' house consistently registered in the 55-parts-per-trillion range, while a vegetable garden next door, at the Brookses' home, contained 350 parts per trillion. Goldman said those levels are much higher than she would have expected to have found in a semi-rural area like Oroville. Beyond that, she and others are reluctant to speculate. That reluctance frightens some local residents as much as bad news.
"The way she (Goldman) is talking, it could be months or years before they have answers," Ruth Lightle said. "In the meantime, we are still breathing it and eating it. I don't want my kids exposed to it. "My kids were scared to death to go to sleep that night (neighbor Elaine Brooks died)," she added. "They were sure they were going to die in their sleep."
The Koppers fire initially was the suspected source of the dioxins, but state scientists noted that the area of heavy ground contamination was not in the path of the smoke plume. Also, the liver of a calf butchered and frozen in a homeowner's freezer two years before the fire showed the same pattern and levels of contamination as the liver of a calf slaughtered a year after the blaze.
Other Possible Sources
"That tended to throw out the fire as the sole source of this problem," Goldman said. Instead, she said the fire likely is one of several dioxin sources. Others include the plant's earlier fire, air emissions from the factory and the use of penta-tainted sawdust and ash from the plant as soil additives. Dioxins may also come from the use of penta as an over-the-counter weed-killer in the 1960s and '70s, or the domestic use of treated fence posts or railroad ties. That view was seconded by Smith, Koppers' plant engineer who thinks the intensely hot fire may have burned up as much dioxin as it created.
"I don't disagree that we are a potential source of dioxin," he said, "but I just don't think we were the source of dioxin."
Goldman is skeptical of potential sources other than pentachlorophenol, like the local practice of burning pesticide-treated rice stubble, because she said the "chemical fingerprints" of the dioxins indicate that they came from the wood preservative. She has also ruled out contaminated animal feed as a potential source.
"Given that the stuff is in cattle and chickens, we figure it has to be something fairly generalized—either air, water or soil," she said. "That is all they have in common."
Goldman stressed that the state is committed to trying to find the source of dioxins and mitigating their danger. But, she conceded, the source may never be pinned down, and no one is certain how dangerous the material really is.
The best estimate, she said, is that the eggs with the 9.8-parts-per-trillion level should be expected to result in one additional cancer out of every 1,000 people eating them. In other words, instead of 250 to 300 cancer cases that statistics would usually predict for a group that size, there would be 251 to 301.
That is low, but still a 100 to 1,000 times higher risk than what usually is acceptable in state and federal
regulations.
The risk was discounted further by other medical experts, such as Michael Kamrin, a natural sciences
professor at Michigan State University's Center for Environmental Toxicology and editor of the book,
"Dioxins in the Environment."
"In terms of human evidence," he said, "there is little evidence that low-level, short-term exposure causes
serious problems."

Opt for Untainted Meat
He conceded that if given the choice between tainted and untainted meat, "I obviously would choose the
meat without dioxins.
"But, I don't really see it (the Oroville situation) as a real serious health problem."
That hardly consoled people who live in the area. They now track friends and neighbors who have
developed cancer or died over the last 10 years, regardless of the cause. Their map has 22 Xs
representing people with cancer and 10 dots marking those who have died.
"The statistics they use are just statistics to them," said Kaylynn Newhart, who lives a quarter-mile from
the still-operating plant. "But to us, those statistics are our parents and brothers and sisters and children."
"Five extra cancers (the worst-case estimate by researchers) might not sound like much," said Ruth
Lightle, looking anxiously at her husband. "But which five people? That's what we want to know. Is this
going to be everyone in our family?"

Uncertainty permeates debates about the dangers of dioxins, a class of several isomers so idiosyncratic
that a dose capable of killing a guinea pig is only 0.02% of the lethal dose for a hamster. Kamrin said
safety standards for the compound vary by a factor of 1 million among the world's developed nations.
Goldman said people who eat tainted eggs probably run a greater risk of heart disease than dioxin-
induced liver cancer because of the eggs' naturally high cholesterol level. But, she added, "they are at risk
(from dioxins) in that the levels we're finding in eggs are unacceptable for consumption."
That is not news to members of the community, particularly people living on small ranches south of the
plant, which is just south of the city. Before the toxic fire, they had already been fighting Koppers over its
pollution of local ground-water supplies.
"What's sad about the fire," Newhart said, "is that it crushed every last hope we had that things were
returning to normal" after the shock of learning that local water supplies were adulterated and may have
been adulterated for decades.
After Koppers said it had discovered the contamination in 1983-10 years after state water officials
confirmed the presence of pentachlorophenol in 10 local wells-the company paid to have affected
residents connected to the municipal water system for domestic use. Irrigation water still is pump-
Motel Costs Paid
The company also agreed to pick up motel costs for people evacuated from their homes during the fire
and puts out a newsletter to residents on its various cleanup efforts.
Koppers has not, however, told local people what to do with the cattle they raise, the chickens they keep
or the produce they grow. Meanwhile, state officials offer only sketchy advice—essentially, shun the livers,
trim the fat and take your chances.
"I have two freezers of beef in there," said Herb Lightle, gesturing toward his garage where he keeps a
dressed heifer he said he had butchered in order to supply the state with beef samples for analysis. "They
already told us it was so high we can't eat it. But they also said we can't sell it or even give it away."
"There is a man down the road who grows sweet potatoes," Ruth Lightle added. "He gave some of them
to his neighbors, but they don't know whether to eat them."
"We were going to retire here and raise some calves to supplement our income," said Norma Prince, one
of several local residents who have sued Koppers. "But we had to get rid of our calves. We had to get rid
of our hogs. Our chickens wobbled around and died. Our cats became so paralyzed in their hindquarters
they dragged themselves around until my husband finally had to shoot them.
"Our land is contaminated. Our water is contaminated. What do we do? Where do we go? We're too old
to start over."
THE EFFECTS OF DIOXIN
The recent death of a Northern California farm woman has rekindled fears of contamination of chicken
eggs by the cancer-causing dioxin. Here is some of what is known about the effects of dioxin:
Classification Dioxins are an entire class of materials and should be referred to in the plural, although most references are to the most harmful isomer, called 2,3,7,8 TCDD. Effects in Humans only confirmed symptom of excessive dioxin exposure is chloracne, a severe form of teen-age acne; pustules usually appear anywhere on the body six months after first exposure and can linger for up to 10 years. Other effects, including cancer (in particular, liver cancer), neurological problems and birth defects in children have been reported (especially by veterans exposed to Agent Orange in Vietnam). These effects have not been documented to scientific certainty. Effects in Animals have proved to be much more acute poisons than cyanide. Small amounts can kill swiftly. However, effects are idiosyncratic: hamsters, for example, can survive up to about 5,000 times the dose that will kill guinea pigs. Sub-lethal doses affect appetite, causing animals to shun food until they starve. Chronic, relatively high trace exposures do cause cancer (especially liver cancer) and birth defects in lab animals. How Dioxins Attack mechanisms by which dioxins harm people and animals are little understood by scientists, despite the fact that dioxins are now studied intensively. Studies as far back as the 1940s indicate that humans may be far less sensitive to the effects than animals. Source: Center for Environmental Toxicology, Michigan State University