

California Watch

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Threat posed by radioactive milk tough to measure

April 5, 2011 | [Susanne Rust \(/user/susanne-rust\)](#)



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Analyses indicate radiation from Japan's nuclear "fallout" has found its way into the California milk supply.

Last week, samples taken from a farm in San Luis Obispo and Spokane, Wash., showed contamination with low levels of the radioactive isotope, iodine 131.

Not surprisingly, there was instant speculation about whether that milk posed a threat to human health.

Government officials were quick to say the levels were low and posed no risk.

"Radiation is all around us in our daily lives, and these findings are a miniscule amount compared to what people experience every day," wrote Patricia Hansen, a Food and Drug Administration scientist, [in response \(http://yosemite.epa.gov/opa/admpress.nsf/bd4379a92ceceec8525735900400c27/8aca5fe3d1d30ebc85257863007](http://yosemite.epa.gov/opa/admpress.nsf/bd4379a92ceceec8525735900400c27/8aca5fe3d1d30ebc85257863007) [OpenDocument](#)) to the milk findings.

"For example, a person would be exposed to low levels of radiation on a round-trip cross-country flight, watching television, and even from construction materials," she wrote.

There was an almost immediate backlash to her statement.

A coalition of scientists and environmentalists insisted ingesting radiation is not the same as background exposures from airplane flights.

"The FDA spokesperson should have informed the public that radioiodine provides a unique form of exposure in that it concentrates rapidly in dairy products and in the human thyroid," wrote Robert Alvarez, a former senior policy adviser to President Clinton's U.S. Secretary of Energy.

"The dose received, based on official measurements, may be quite small, and pose an equally small risk," Alvarez said in a statement. "However, making a conclusion on the basis of one measurement is fragmentary at best and unscientific at worst. As the accident in Fukushima continues to unfold, the public should be provided with all measurements made of radioactive fallout from the Fukushima reactors to allow for independent analyses."

Indeed, just how radioactive particles – particularly iodine 131 and the more dangerous cesium 137 – move through the food chain remains unclear.

Here's what we do know:

- Iodine 131 has a fairly short "half-life" of eight days, which means that in about 80 days, the isotope is cleared from the body. Scientists also know that it targets the thyroid.
- Cesium 137, on the other hand, has a half-life of 80 years, and goes straight for the bones.

But knowing those details doesn't address questions regarding the effects of chronic or cumulative intake of these substances. For instance, how are people affected when they drink contaminated milk, water or vegetables on a daily basis?

According to a [fact sheet \(http://www.atsdr.cdc.gov/csem/iodine/biologic_fate.html\)](http://www.atsdr.cdc.gov/csem/iodine/biologic_fate.html) I found from the Agency for Toxic Substances and Disease Registry, an arm of the Centers for Disease Control and Prevention, the half-life of the chemical doesn't matter when chronic exposure occurs, "because new releases occur continuously."

Therefore, a contaminated milk supply represents a continuous and chronic exposure.

So, what does that mean? Do the isotopes biomagnify – or concentrate – as they move up the food chain, as dioxins and some other toxins do? And will fatty milk, or cream, have more radioactive nucleotides than skim milk?

Getting concrete answers for these questions was difficult.

Here's what I found: Cows, sheep and other grazing animals ingest radiation when radioactive particles drift and drop onto grass and feed. If rainwater is contaminated, that can increase the concentration of radioactive particles an animal is exposed to.

Once the animal has ingested the contaminated particles, some is released into its milk. And according to the Agency for Toxic Substances, different animals have different concentration levels of radioactive particles. For instance, goat and sheep's milk have higher levels of iodine 131 than cow's milk. Whether that is due to their size, or the fat concentrations in the milk, I was not able to determine.

However, it should be noted that radioactive concentrations in food drop with time. So the longer a gallon of milk sits on the store or refrigerator shelf, the less the amount of radiation – specifically iodine 131. That's because of iodine 131's eight-day half-life.

What about mothers who are breast-feeding? Presumably, if cows, sheep and goats can pass radiation along in their milk, so can humans.

It was this concern that enraged Michael Mariotte, the executive director of Nuclear Information and Resource Service, when the federal government released its statement downplaying the milk situation.

“No mother should ever have to wonder if the milk she feeds her child might be harmful,” he wrote in a statement. “Having worked on nuclear issues for 25 years, I know the difference between internal exposures and background radiation. But lots of people don’t. As the father of an 11-month old daughter, I’m personally furious at the government for this misleading information.”

However, because humans aren’t grazing irradiated grass and feed, their concentration is presumably less than a cow or sheep's.

But, what does this all mean?

Paul Carroll, a nuclear expert with Ploughshares Fund, a San-Francisco-based international nuclear security foundation, said the information on long-term chronic exposure and food chain effects is murky.

Scientists learned a lot from the bombs that dropped on Japan at the end of World War II, and from Chernobyl. But a lot of the questions we ask now about radiation exposure we didn't know to ask back then. And long-term epidemiological studies on people can't always give definitive answers to questions such as, "How much radiation causes cancer?" or "How long do you have to be exposed?"

The bottom line, he said, is that “any additional exposure to radiation will increase your risk of developing cancer.”

Here are some more fact sheets on food and radiation:

[Physicians for Social Responsibility \[PDF\] \(http://www.psr.org/resources/health-risks-releases-radioactivity.pdf\)](http://www.psr.org/resources/health-risks-releases-radioactivity.pdf)

[Food and Water Watch \[PDF\] \(http://documents.foodandwaterwatch.org/japan-radiation.pdf\)](http://documents.foodandwaterwatch.org/japan-radiation.pdf)

[The Institute for Energy and Environmental Research \[PDF\] \(http://www.ieer.org/fctsheets/radiationhealthfactsheet_2011.pdf\)](http://www.ieer.org/fctsheets/radiationhealthfactsheet_2011.pdf)

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