



Why is the FDA Ignoring Toxic Chemicals in Irradiated Food?

Since their work began in 1998, government researchers in Germany have made some alarming discoveries about unique chemicals formed in food when it is “treated” with radiation.

Cyclobutanones – which do not occur naturally in any food – were shown to promote cancer development and cause genetic damage in rats. The chemicals have also been shown to cause genetic and cellular damage to human and rat cells.

Even though many irradiated foods that can legally be sold to the public could contain cyclobutanones – including eggs, beef, pork, chicken, lamb, mangoes and papayas – the U.S. Food and Drug Administration has done nothing to alert Americans about these toxic chemicals. And, the FDA is actively considering irradiation for ready-to-eat foods and seafood, in which cyclobutanones have also been discovered.

Because cyclobutanones are byproducts of fats that occur in hundreds of types of food, the potential hazards of these chemicals is great.

While the FDA sits on its hands, Americans could be unwittingly ingesting these toxic chemicals. The risk is there. But where is the FDA?

The revelations about cyclobutanones are both ironic and dangerous.

The irony is these chemicals are so easily detected and remain in food for so long that they are commonly used as “chemical markers” to determine whether food has been exposed to ionizing radiation.¹ This is a good thing if you’re a government official inspecting a crate of imported mangoes.

The danger is that FDA has never done a formal analysis of the potential health hazards of cyclobutanones – even though they were first discovered in irradiated foods in 1971.² Meanwhile, the FDA has legalized irradiation for many major food groups, including fruit, vegetables, beef, pork, poultry and eggs. This is a bad thing if you’re a parent concerned about what your children eat.

Today, people throughout the country could be eating irradiated foods that contain cyclobutanones

without their informed consent.

Though irradiated whole foods sold in stores – such as apples, carrots and pork chops – must be labeled “Treated by Irradiation” or “Treated with Radiation,” there is no such requirement for most irradiated ingredients, such as spices used in canned soup, and vegetables used in frozen dinners.

Nor is there such a requirement for irradiated foods served in restaurants, schools, hospitals, nursing homes, day-care centers and other institutional settings.

The situation could get worse. As of spring 2002, the FDA was considering irradiation for molluscan shellfish, such as clams, oysters and mussels; crustacean shellfish, such as shrimp, crabs and lobsters; and – most significantly – ready-to-eat foods, such as canned and frozen foods, deli meat, baby food, pre-cut salads, snack foods, sauces and condiments.

The ready-to-eat food proposal is so worrisome because these foods comprise 37 percent of the typical American's diet, according to the National Food Processors Association, which filed the request with the FDA.³

More worrisome still, high-ranking FDA officials admit that they have not compiled a list of foods defined as "ready-to-eat." One agency official said the category could include virtually "anything."⁴ Such uncertainty would make it virtually impossible for consumers to know whether the foods they're eating contain the types of fats from which cyclobutanones are formed.

Communication Breakdown

Consumers would be at an even greater disadvantage if the FDA approves an industry-backed proposal to allow irradiated foods to be labeled "electronically pasteurized" or "cold pasteurized."

The FDA is considering these euphemisms even though 98 percent of people who have written the FDA on the issue said they want the current labeling law maintained, and even though participants in FDA focus groups unanimously opposed these phrases, calling them "sneaky," "misleading" and "a fake."

Under the Microscope

Research into the potential toxicity of cyclobutanones came to light in 1998. Henry Delincée of Germany's Federal Research Center for Nutrition found that a specific cyclobutanone called 2-DCB caused genetic and cellular damage to human and rat colon cells.⁵

In three subsequent experiments, Delincée and his colleagues found that 2-DCB caused genetic damage in rats⁶; that related chemicals called 2-TCB and 2-TDCB caused genetic and cellular damage in human cell cultures⁷; and – most disturbing of all – that cyclobutanones promoted cancer development in rats.⁸

Concluded Delincée: "The results urge caution, and should provide impetus for further studies."

By all accounts, FDA officials do not seem to be taking Delincée's advice.

Case in point: In March 2000, several FDA staffers – including a high-ranking food safety official – attended an international conference at which Delincée's findings were discussed.⁹ Nonetheless, the FDA three months later legalized irradiation for eggs,¹⁰ in which cyclobutanones were first discovered eight years earlier.¹¹

Europe Takes It Seriously

Meanwhile, the FDA's counterparts in Europe are treating the matter far more cautiously.

In spring 2002, the 15-member European Union

succeeded in delaying an international proposal by the Codex Alimentarius Commission (which sets food safety standards for more than 160 nations) to allow any food to be irradiated at any dose – no matter how high.

And, the EU has delayed its own proposal to allow irradiation for shrimp, frog legs, cereal grains, egg whites and other foods, until ongoing experiments into the toxicity of cyclobutanones are completed.

This approach to policy-making, known as the precautionary principle, is more prevalent in Europe than in the U.S., where government officials are much more inclined make political decisions before all the facts are in.

Righting the Wrongs

In the interest of protecting the public health, we have called on the FDA to:

- ♦ Analyze the cyclobutanone levels of all foods that the FDA has legalized or has under consideration for irradiation;
- ♦ Refrain from legalizing irradiation for any additional foods until comprehensive, published, peer-reviewed research is conducted into the potential health hazards of cyclobutanones; and
- ♦ Convene public hearings to thoroughly explore and educate consumers about the potential health hazards of cyclobutanones.

Notes

- ¹ Stevenson, M.H. "Identification of irradiated foods." *Food Tech*, 48:141-144, 1994.
- ² LeTellier, P.R. and Nawar, W.W. "2-alkylcyclobutanones from the radiolysis of triglycerides." *Lipids*, 7: 75-76, 1972.
- ³ FDA Food Additive Petition 9M4697, Docket No. 99F-5522.
- ⁴ Personal communication with Laura Tarantino, Deputy Director, FDA Office of Premarket Approval, June 27, 2001.
- ⁵ Delincée, H. and Pool-Zobel, B. "Genotoxic properties of 2-dodecylcyclobutanone, a compound formed on irradiation of food containing fat." *Rad Phys and Chem*, 52:39-42, 1998.
- ⁶ Delincée, H. et al. "Genotoxicity of 2-dodecylcyclobutanone." *Food Irradiation: 5th German Conference*, Karlsruhe, Nov. 1998.
- ⁷ Delincée, H. et al. "Genotoxicity of 2-alkylcyclobutanones." (Abstract) 12th International Meeting on Radiation Processing, March 25-30, 2001, Avignon, France.
- ⁸ Marchioni, Eric et al. "Information about the potential toxicity of 2-alkylcyclobutanones." *International Consultative Group on Food Irradiation*, Dec. 2001.
- ⁹ Annual Report on Activities: 17th Meeting of the International Consultative Group on Food Irradiation. Geneva, Nov. 2000.
- ¹⁰ 65 Federal Register 45280, July 21, 2000.
- ¹¹ Crone, A.V.J. et al. "Synthesis, characterization and use of 2-tetradecylcyclobutanone together with other cyclobutanones as markers for irradiated liquid whole egg." *Jour Sci Food Agric*, 62:361-367, 1993.



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