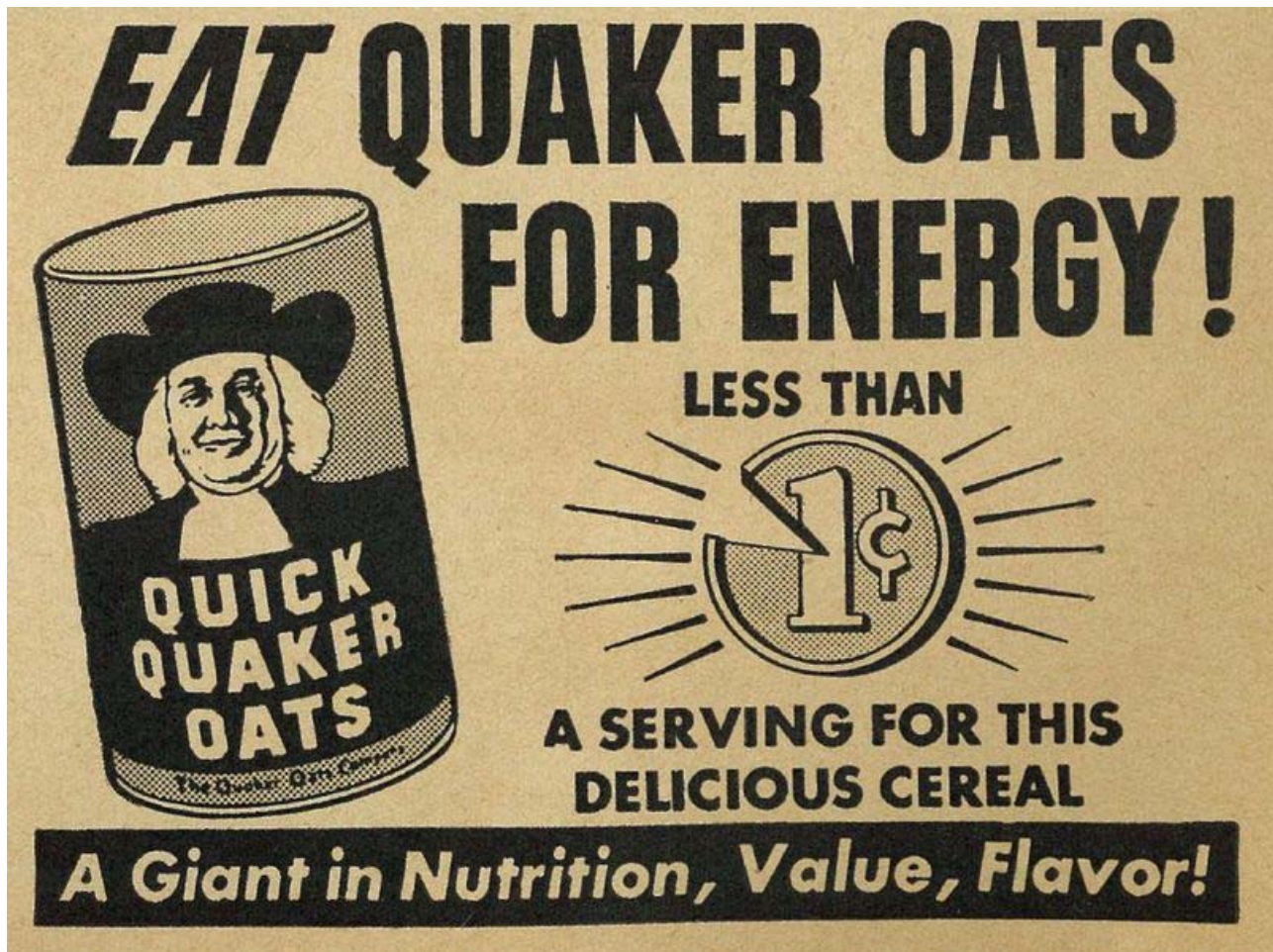


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A Spoonful of Sugar Helps the Radioactive Oatmeal Go Down

When MIT and Quaker Oats paired up to conduct experiments on unsuspecting young boys



For years, boys at Fernald State School were subjected to experiments using radioactive tracers in oatmeal. ([Flickr](#))

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When Fred Boyce and dozens of other boys joined the Science Club at Fernald State School in 1949, it was more about the perks than the science. Club members scored tickets to Boston Red Sox games, trips off the school grounds, gifts like Mickey Mouse watches and lots of free breakfasts. But Fernald wasn't an ordinary school, and the free breakfasts from the Science Club weren't your average bowl of cereal: the boys were being fed Quaker oatmeal laced with radioactive tracers.

The Fernald State School, originally called The Massachusetts School for the Feeble-Minded, housed mentally disabled children along with those who had been abandoned by their parents. Conditions at the school were often brutal; staff deprived boys of meals, forced them to do manual labor and [abused them](#). Boyce, who lived there after being abandoned by his family, was eager to join the Science Club. He hoped the scientists, in their positions of authority, might see the mistreatment and put an end to it.

"We didn't know anything at the time," [Boyce said of the experiments](#). "We just thought we were special." Learning the truth about the club felt like a deep betrayal.

The boys didn't find out the whole story about their contaminated cereal for another four decades. During a stretch between the late

1940s and early 1950s, Robert Harris, a professor of nutrition at the Massachusetts Institute of Technology, led three different experiments involving [74 Fernald boys, aged 10 to 17](#). As part of the study, the boys were fed oatmeal and milk laced with radioactive iron and calcium; in another experiment, scientists directly injected the boys with radioactive calcium.

The Fernald students' experiment was just one among dozens of radiation experiments approved by the [Atomic Energy Commission](#). Between 1945 and 1962, [more than 210,000 civilians and GIs](#) were exposed to radiation, often without knowing it. What seems unthinkable in today's era of ethics review boards and informed consent was standard procedure at the dawning of the Atomic Age.

John Lantos, a pediatrician at University of Missouri-Kansas City School of Medicine and expert in medical ethics, says the experiments were indicative of America's post-war mindset. "Technology was good, we were the leaders, we were the good guys, so anything we did could not be bad," he says. "It wasn't until the '70s, after the [Tuskegee study](#), that Congress passed federal regulation requiring a specific kind of oversight."

The Tuskegee study is the benchmark example of medical abuse and involved hundreds of African-American men with syphilis who were [promised treatment but never received it](#). In another case reminiscent of the one at Fernald, students at Willowbrook State School (also considered mentally handicapped) were [purposely exposed to the Hepatitis A virus](#) so that researchers could develop a vaccine.

How did a seemingly innocuous breakfast food get tied up with Atomic Age research? At the time, scientists were eager to conduct experiments concerning human health, and the booming breakfast cereal industry meant there was big money to be made or lost. As a result, brands like Quaker wanted science on their side. They'd been locked in competition with another hot breakfast cereal—Cream of Wheat, made with farina—since the early 1900s. And both of the hot cereal companies had to contend with the rise of sugary dry cereals, served with cold milk and a [heaping portion of advertising](#).

To make matters worse for Quaker, a series of studies suggested high levels of phytate (a naturally occurring cyclic acid) in plant-based grains—like oats—might inhibit absorption of iron, whereas farina (Cream of Wheat) didn't [seem to have the same effect](#). The market for cereal products was booming—in the post-WWII years, Quaker's sales grew to [\\$277 million](#). Nutrition was high in the minds of buyers of the era, especially since the Department of Agriculture produced its first [dietary guidelines in 1943](#), including oatmeal as an ideal whole grain. Television advertisements from the 1950s highlighted Quaker Oats' nutritional content as a selling point.

In a bid to refute the research that unfavorably compared Quaker with Cream of Wheat, Quaker decided to do experiments of its own. So Quaker supplied the cereal, MIT received funding for their research, and the school, presumably, provided free breakfast and entertainment for its students.

In the three experiments, the boys at Fernald ate oats coated with radioactive iron tracers, milk with radioactive calcium tracers (radioactive atoms whose decay is measured to understand chemical reactions happening in the body), and were given injections of radioactive calcium. The first two experiments' results were encouraging to Quaker: Oatmeal was no worse than farina when it came to inhibiting absorption of iron and calcium into the bloodstream. The third experiment showed that calcium entering the bloodstream goes straight to the bones, which would prove important in [later studies of osteoporosis](#).

The details of the experiments came out in 1993, when Secretary of Energy Hazel O'Leary declassified a number of Atomic Energy Commission documents, [spurred in part by Eileen Welsome's](#) investigative reporting on other radiation testing by the U.S. government, and intensified concern over the [nuclear weapons industry](#). Then came a [report in the *Boston Globe*](#). Soon other publications were urging victims to come forward.

A 1995 lawsuit pinpointed the purpose of these experiments: Quaker's commercial interests. "What was the genesis of these particular experiments? It seems simply to be what are the relative benefits of oatmeal and Cream of Wheat," prosecuting attorney Michael [Mattchen told the *Associated Press*](#).

A hearing before the Senate's Committee on Labor and Human Resources was called in January 1994 to investigate the Fernald experiments. During the session, [Senator Edward Kennedy, the committee chair, asked](#) why researchers hadn't conducted the experiment on MIT students or children at private schools. "Aren't you appalled at the fact that the most vulnerable people in our society, which are young people, 7, 8 years old, that are in an institution, aren't you appalled that they were the ones selected?" he asked.

At the Senate hearing, David Litster of MIT said the experiment involving oatmeal only exposed the boys to [170 to 330 millirems of radiation](#), roughly the equivalent of receiving 30 consecutive chest x-rays.

"As to what are the medical and biological effects of that, with such low doses of radiation, it's very difficult," [Litster said](#). A child exposed to that kind of dose, he said, would have a one in 2,000 chance of contracting cancer, which was barely higher than the average rate. A 1994 Massachusetts state panel concluded none of the students [suffered significant health impacts](#), and [radioactive tracers continue to be used](#) in medicine.

But the real issues weren't simply a matter of future health risk: the boys, who were especially vulnerable without parents and guardians

looking out for their best interests in the state school, were used for experiments without their consent.

When the case went to court, 30 former Fernald students filed suit against MIT and Quaker Oats. In 1995, President Clinton apologized to the Fernald students, since the [Atomic Energy Commission](#) had indirectly sponsored the study with a contract to the radioactivity center at MIT. A settlement for [\\$1.85 million](#) was reached in January 1998. Even before this particular case, regulations like the National Research Act of 1974 had been enacted to protect Americans from unethical experiments.

At the end of the three experiments the boys at Fernald unwittingly participated in, scientists did have some important new findings—though they had nothing to do with cereal. After injecting nine young boys with radioactive calcium, researchers were able to determine what happens to calcium after it enters the bloodstream (it quickly goes to the bones) and how it is excreted (mostly through urine). This research on calcium metabolism provided the groundwork for later research on osteoporosis, [according to Litster](#).

But for Boyce, the pain of abuse lingers. “It’s a funny type of animosity. It’s a disappointing type of feeling,” [he said](#) of the researchers who had the opportunity to help, but instead took advantage of students in need.

About Lorraine Boissoneault

Lorraine Boissoneault is a contributing writer to *SmithsonianMag.com* covering history and archaeology. She has previously written for *The Atlantic*, *Salon*, *Nautilus* and others. She is also the author of *Website*:

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