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THE FARM REPORTER

Henry Schacht

Why Irradiated Food Items Never Found Their Market

9798

What ever happened to irradiated foods?

In case anyone is asking, we can report that there is no ready demand for them and that the food industry is showing no interest. Contrast that with the many news reports in 1983-87 suggesting that irradiation was about to sweep the industry.

Focusing gamma rays on food, it was predicted, would free them of all manner of pests and diseases, keep them in top condition indefinitely on shelves and protect the public from food-borne disease organisms such as salmonella.

Irradiation had long been approved for spices and seasonings. Then the Food and Drug Administration OKd it for fresh pork and some fruits and vegetables. Poultry was thought to be next.

But a strange thing happened. Consumers showed no great interest in irradiated products. That being the case, neither did food distributors nor investors who might have set up irradiation facilities. The attitude within the food industry was: Who needs it?

Despite reassurance from the FDA and from the scientific community, questions arose about the safety of irradiated products. Not that irradiation would render the products radioactive. But fears were raised that it might create new and dangerous byproducts.

California and Florida supermarkets that offered irradiated mangoes and papaya found crowds of placard-carrying protesters at their doors. It was suggested that approval of radiation was a government plot to dispose of radioactive wastes in hundreds of concrete bunkers masquerading as irradiation plants.

Before long, the food industry lost whatever enthusiasm it had for irradiation.

Now the FDA has recognized the reality. The FDA developed a distinctive logo to be placed on irradiated products. The agency predicted that by April 19 this logo would be so familiar to consumers that food products would no longer have to be labeled "treated with irradiation."

Now the FDA has backed off that plan. Labels on irradiated products will have to carry the statement. The logo has been so little seen that few consumers recognize it.

Irradiation supporters point out that microwave ovens were also looked upon with suspicion at first, but now are found in millions of households. Whatever hope that observation raises for irradiation is faint indeed.

WEDNESDAY, SEPTEMBER 24, 1986

The New York Times

Fruit, Fish and Gamma Rays

Insects, bacteria and mold are the enemies of fresh food. All can be arrested by energetic radiation — typically a zap of gamma rays. The Food and Drug Administration recently approved the sale of irradiated fruit and may soon allow that of fish and poultry too. Is that hasty? Irradiated food sounds unappetizing. Is it also unsafe?

The food itself does not become radioactive. The main safety concern is that the gamma rays, from a radioactive source, produce what chemists call free radicals. These disruptive agents agitate among other molecules and create new chemicals in the irradiated food. The Food and Drug Administration does not consider free radicals a serious menace. It contends that the new products are so similar to natural chemicals as to pose no unusual problem — and besides, they're created in insignificant amounts.

That's an interesting theory. Where's the proof? Preserving food by radiation is an old idea. A raft of studies has accumulated on feeding irradiated food to animals. The agency recently reviewed more than 400, and rejected all but 67 as worthless. Of the 67, about half conclude that irradiated food is toxic, half that it isn't. That's hardly a seal of approval. But the agency then conducted another review, after which only five studies were deemed to meet modern toxicology standards. All five showed no adverse effects.

Maybe this backward-looking procedure justifies giving the irradiation technique a chance. It's been safely used for some time on spices. But they form a tiny part of the diet. For major items like fruit and meat: more persuasive evidence of safety would be comforting. Before the F.D.A. goes much further, it should ask an independent group like the National Academy of Sciences to review its rationale, as proposed in a bill by Representative Douglas Bosco, Democrat of California.

Proponents say irradiation will permit abandoning toxic fumigants like EDB, kill the agents of food poisoning in chicken and of trichinosis in pork and provide indefinite shelf life. These are substantial benefits. But to kill bacteria demands even higher radiation dosages than those already approved, producing more of those chemicals.

The higher doses are also more likely to degrade vitamins and nutrients. Another concern is that irradiation may alter the natural balance among bacteria in food and remove the stink that warns of taint and toxins.

New technology should be allowed every reasonable chance of finding useful market niches. Food irradiation is an old and dubious technology that deserves a chance but no special break. At present, irradiated food must bear a logo and the label "treated with radiation," but the F.D.A. proposes to let the labeling requirement lapse after two years. If the agency wants to help the technique along, let it demand more compelling proof of safety, not acquiesce in hiding the gamma rays and plunging consumers into the dark.

The Star-Ledger

The Newspaper for New Jersey, Saturday, December 9, 1989

Governor 'zaps' irradiated food

By ROBERT SCHWANEBERG

The sale or manufacture of irradiated food is banned in New Jersey for two years under a bill signed yesterday by Gov. Thomas Kean.

"There are just a whole lot of questions involved with irradiated food and not a whole lot of answers," Kean said. "I just felt it was better to be safe than sorry."

Irradiation kills insects and other organisms in food and extends the shelf life of some food items. Critics claim it also causes chemical changes with effects that have not been fully studied.

Kean proposed the two-year moratorium in August as an alternative to a permanent ban on the sale of irradiated food—a measure he had earlier vetoed.

Although the federal Food and Drug Administration has approved irradiation of some food items since 1963, Kean said "a public consensus has yet to be achieved over the safety of food irradiation."

The bill (S-1816) was sponsored by Sen. John Dorsey (R-Morris). Assemblyman John Kelly (R-Essex) sponsored identical legislation in the lower house. The moratorium does not apply to irradiated spices.

The new law, which took effect immediately, made New Jersey the third state to ban irradiated food. New York adopted a two-year moratorium in August, while Maine has banned the sale of irradiated food indefinitely.

Food and Water Inc., a Denville-based group that has lobbied against food irradiation, praised Kean's two-year moratorium. Dr. Walter Burnstein, the group's president,

Please turn to Page 13

Continued from Page One

said the benefits of food irradiation "are insignificant when compared to the detrimental effects to human health and the environment."

George Giddings, a Whippany radiation processing consultant, was "very upset" by the moratorium. He said there is an "overwhelming consensus" within the scientific community, though perhaps not the general public, "that irradiated food is safe and wholesome."

Giddings also said the moratorium would have "minimal" practical effect, as almost no irradiated food is currently produced in or imported into New Jersey. He said there was a possibility the FDA might soon approve irradiation of poultry to control salmonella and other organisms, in which case New Jersey consumers would "be denied that public health benefit."

Michael Colby, associate director of Food and Water, argued exposing poultry to irradiation would only be "adding a problem to a problem." He said salmonella in poultry is a result of unsanitary processing and should be addressed by "cleaning up the process."

Colby and Giddings agreed the major effect of the bill would be to set the stage for a continuing battle as to whether food irradiation should be banned permanently.

Colby said there is enough evidence of health and environmental hazards to justify such a ban. Giddings said, "I'm confident that the basis for reaching a public consensus on the safety of irradiated food will continue to grow."

Food irradiation: Is it a safe process for consumer health?

7-7-88

Public awaits outcome of debate to make informed choice

FRESNO, Calif. (AP) — Zapping fresh foods with radiation may increase their shelf life and make them safer to eat. But the notion of eating irradiated fruits, vegetables and meats leaves a bad taste in some mouths.

Despite claims by some scientists, the federal government and others that irradiation is a safe way to rid foods of bacteria, microorganisms or insects, anti-nuclear activists and other scientists insist it can harm people.

The process involves running produce on a conveyor belt around a radiation source for a few seconds or minutes. Eighteen-inch long rods containing either cobalt 60 or cesium 137 treat the foods without raising their temperature. When not in use, the rods are immersed in water as a safety precaution.

X-rays and gamma rays break chemical bonds and "either disrupt the ongoing process of decay or any contaminant on the food," said Christine Bruhn, consumer food marketing specialist with the University of California Cooperative Extension at Davis.

Supporters say food does not become radioactive at the doses used and is safe to handle and eat immediately after irradiation. They say it can extend shelf life of some produce and meats and rid pork of dangerous parasites.

"Irradiated food has been shown repeatedly to produce adverse health effects . . ."
— Denis Mosgofian, director of Coalition to Stop Food Irradiation

"Scientists say it is safer than products contaminated with microorganisms or mold or some chemically approved products," Bruhn said.

Opponents contend that studies showing adverse effects have been ignored or suppressed. One found chromosome damage in humans four weeks after they ate freshly irradiated wheat, said Denis Mosgofian, director of the San Francisco-based Coalition to Stop Food Irradiation.

"Irradiation of food actually changes the food, rearranges its chemistry, creates new chemicals, many of which are toxic," Mosgofian said. "Irradiated food has been shown repeatedly to produce adverse health effects to both animals and humans who consumed it."

Rep. Douglas Bosco, D-Calif., introduced legislation in March to rescind a 1986 ruling by the Food and Drug Administration allowing the sale of irradiated foods. He also called for a National Academy of Sciences study of the process.

Bosco said he wanted "any new technology proven safe before it is allowed to permeate our food chain."

Concern also has been raised that irradiation might allow mutations of bacterias or viruses, but a World Health Organization study turned up none. "It could happen in the future," Bruhn said. "It's unlikely."

Irradiated food is rare at U.S. supermarkets, partly because fumigation is cheaper. But the process is used to sterilize medical equipment at 40 plants in the United States, and some spices are irradiated to kill microbes.

Produce and pork can be treated with radiation before marketing, but consumers are leery

Irradiated food: Is it safe?

■ Imagine sinking your teeth into a feast of irradiated pork chops, asparagus zapped with gamma rays and, for dessert, strawberries à la cobalt 60.

Yummy or not, it's an American menu of tomorrow—if some federal officials and food processors get their way.

Radiation is being touted by the nuclear industry and food companies as a safe alternative to chemical pesticides and a way to kill parasites like trichina found in some swine herds.

The Food and Drug Administration in April approved its use on fruits, vegetables and fresh pork, and the U.S. Agriculture Department wants the FDA to authorize it for poultry as a way of controlling salmonella, bacteria that kill 2,000 Americans yearly.

Sometime this fall, in a limited-market test of consumer acceptance, a few stores will begin selling radiation-treated potatoes or onions in the Pacific Northwest. The industry will keep locations secret for fear of protesters. And there's the hitch. FDA rule making on irradiation has drawn more mail from worried consumers than any issue in recent times. Resolutions urging a ban on irradiation or stricter labeling have been introduced in at least six states. Faced with rising opposition, the food industry is taking a wait-and-see attitude before pushing treated meats and produce to market.

The process leaves no radiation residue on food, and agencies from the FDA to the World Health Organization say that foods exposed to low doses are safe for human consumption. However, the subject is shrouded in fear and scientific unknowns. The few tests of irradiated food on people have been brief, and critics charge that not enough reliable animal studies have been done. Irradiation does break down chemical bonds in food, potentially creating toxins that, in sufficient strength, could cause cancer. But advocates contend that cooking can create as many food toxins.

"The health effects of food irradiation are simply unknown," asserts Dr. John Gofman, professor emeritus of medical physics at the University of California at Berkeley. He says an enormous human experiment lasting 20 years would be needed for a definitive answer.

Public concerns over safety extend to the handling of radioactive cobalt used in the process. In June, the Nuclear Regulatory Commission accused Radiation Technology, Inc.—which had planned to sell irradiated pork, asparagus, avocados and mangoes this summer—of lying to investigators about disconnecting a safety lock on a radiation room door. The firm's license at its Rockaway, N.J., plant was yanked, and the company now faces possible criminal prosecution. Another irradiation firm, International Nutronics, Inc., was indicted on charges of conspiring to cover up a 1982 accident in which radioactive water seeped into soil at its Dover, N.J., plant.

Defenders of the technology contend that the 45 U.S. irradiation plants now used to sterilize medical instruments have a fairly clean safety record. Only two workers have been injured through accidental exposures in the past 20 years. And because no nuclear core is involved, it is impossible for a meltdown to occur.

The food-treatment process is simple. Foods put on a conveyor belt pass near a concrete-and-lead-shielded chamber housing the radioactive source, typically cobalt. Emitted gamma rays destroy insects and bacteria. Higher doses—generally above those allowed by the FDA—also could extend the shelf life of perishables. The process does not work on all foods: It causes leafy vegetables to lose their green color, grapes to become soft and bananas to develop brown spots.

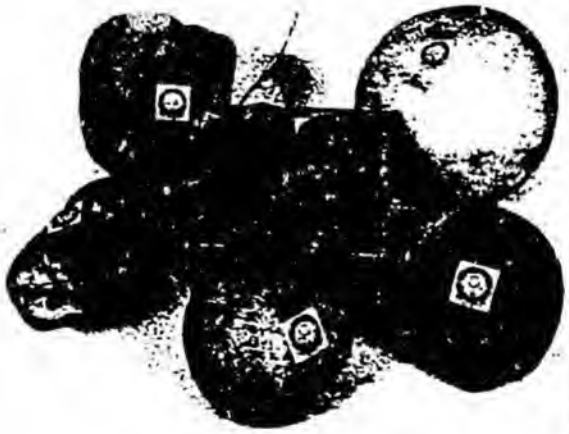
Americans have been eating some irradiated ingredients for the past three years, including dried spices used in some prepared foods such as frozen pizza and cookies. But authorities say less than 1 percent of the spices consumed in the U.S. are treated this way.

The labeling of irradiated food is nearly as controversial as its safety. Surveys show most shoppers would not buy produce labeled as irradiated. However, the FDA plans in two years to drop its rule that foods display the phrase "treated with radiation." Instead, it will continue to require only an international symbol for irradiation—a broken black circle and geometric design—used in countries such as Japan and Holland, where irradiated food has been sold for several years.

Consumer groups are charging that shoppers are kept in the dark because prepared foods that include irradiated ingredients are not required to be labeled. Mark Rosengarden of the National Coalition to Stop Food Irradiation complains: "I don't want my 3½-year-old son eating irradiated food, and there's no way of keeping it out of his mouth."

"This industry will develop slowly," says Bahar Gidwani, a stock analyst at Kidder, Peabody & Company. By the year 2000, though, some promoters envision hundreds of irradiation plants sending such perishables as mangoes to Minnesota and fresh shrimp to South Dakota, and irradiation rivaling canning as a way to preserve foods. Predicts Gidwani: "Within a decade, we'll see every food processor worth his salt in this industry." ■

by Peter Dworkin



■ These fruits and vegetables are good candidates for gamma-ray treatment to kill insects

■ FDA approval of process draws protest from the National Coalition to Stop Food Irradiation

Plant safety also is a concern

Jack Anderson

Zapping Our Food

WASHINGTON — Preserving fresh fruit and vegetables by zapping them with radioactive rays may be the technique of choice in 10 or 15 years, but its safety is still a matter of debate. Meanwhile, a veritable mushroom cloud of controversy has arisen over the Energy Department's bumbling intervention in the situation.

Anderson

The department isn't in the food processing business, of course, nor is it responsible for determining the safety of irradiated food. But as custodian of the government's nuclear waste, the department found itself with a large quantity of radioactive cesium 137 it wanted to unload. It decided that food processors, and medical-equipment sterilizers were the ones who could take the stuff off its hands.

That alone was enough to arouse the wrath of the Health and Energy Institute, a non-profit watchdog group concerned with the dangers of radiation. The Energy Department "is not trying to find the best way to preserve food or protect human health," the institute charges. "It's trying to find a convenient way to get rid of some of its nuclear garbage created by building nuclear weapons."

The uproar over cesium is a recent development. The Energy Department had been trying for years to sell the 77 million curies of cesium it had. There were no critics of the sale plan — mainly because there were no buyers, even when the department dropped its price to a giveaway level of 10 cents per curie.

But within the past few years, three things happened: The government forbade use of the chemical ethylene dibromide — EDB — as a food preservative, which enhanced the attractiveness of the irradiation process. At the same time, cobalt 60, the preferred radioactive material for food processing, was in temporarily short supply, and federal regulations governing food irradiation were broadened.

All of this created a sudden demand for the Energy Department's previously unwanted cesium. And this, in turn, stirred concern among environmentalists.

Even Rep. Sid Morrison, R-Wash., who would dearly love to get the government's cesium out of its present storage site near Richland, Wash., is leery about selling the dangerous material outright. "Selling it is a perilous venture," he told our associate Vicki Warren. "I prefer leasing, because then the government is responsible for the transportation, handling and disposal. They continue to own it."

The Health and Energy Institute is not impressed with this distinction. It points out that, regardless of who owns cesium, and whether it's sold or leased for food irradiation, the radioactive material will still be transported to food processors all over the country by truck and train. This will create a serious risk of accidental leaks or spills, the institute says.

In addition, institute officials note, cesium is stored in cold water when not being used. "Any accidental release of cesium 137 into the cooling pool or the environment would therefore pose serious contamination problems," one official said. "If cesium 137 were introduced into the groundwater, the damage would be irreversible."

So far, the Energy Department has signed only two contracts — both with medical-equipment sterilizers — to lease its cesium. One is with Iotech Inc. of North Glen, Colo., for 12 million curies at $124,200 a year plus $550,000 in start-up costs, with an additional 7 million on order. The other is with Radiation Sterilizer Inc. of Menlo Park for 12 million curies at $173,880 a year plus $800,000 in start-up costs, with a future lease of an additional 9 million curies.

Even here the Energy Department is criticized — for not charging more for its cesium.

"A significant return on investment can come back to the U.S. Treasury through the lease of irradiation source materials to private and public agencies," Morrison told us. But not at the department's bargain-basement prices.

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A-3

EXCERPT

HEARINGS

ON

H.R. 2496

[H.R. 2797]

DEPARTMENT OF ENERGY NATIONAL SECURITY AND MILITARY APPLICATIONS OF NUCLEAR ENERGY AUTHORIZATION ACT OF 1984

BEFORE THE

PROCUREMENT AND MILITARY NUCLEAR SYSTEMS SUBCOMMITTEE

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
NINETY-EIGHTH CONGRESS
FIRST SESSION

HEARINGS HELD MARCH 1 AND 2, 1983

STATEMENT OF DR. F. CHARLES GILBERT, DEPUTY ASSISTANT SECRETARY FOR NUCLEAR MATERIALS, ACCOMPANIED BY RONALD W. COCHRAN, DIRECTOR, OFFICE OF NUCLEAR MATERIALS PRODUCTION, AND GOETZ K. OERTEL, DIRECTOR, OFFICE OF DEFENSE WASTE AND BYPRODUCTS MANAGEMENT

Excerpt, page 195

BYPRODUCTS UTILIZATION

I might comment that I personally feel that the beneficial uses program that we have here is very important and very valuable in two ways. In one way, the utilization of these radioactive materials simply reduces our waste handling problem, at least in the near future, in that we get some of these very hot elements like cesium and strontium out of the waste.

A PLAN FOR RECOVERY AND UTILIZATION OF
NUCLEAR BYPRODUCTS FROM THE DEFENSE NUCLEAR FUEL CYCLE

William C. Renini
John J. Jicha, Jr.
Office of Defense Waste and Byproducts Management
Department of Energy
Washington, DC 20545

Excerpt, page 202

DOE BYPRODUCTS UTILIZATION PROGRAM
JOINT VENTURE SUMMARIES

The strategy being pursued by DOE's Byproducts Utilization Program is designed to transfer federally developed cesium-137 irradiation technology to the commercial sector as rapidly and successfully as possible. The measure of success will be the degree to which this technology is implemented industrially and the subsequent demand created for cesium-137.

WHY DOE IS PROMOTING FOOD IRRADIATION

Isomedix Decontamination Questioned

New Jersey Daily Record
MAY 3 1981

Probe Asked At Irradiation Plant

By CHRIS DUFFY
Business Writer

PARSIPPANY — Former workers at Isomedix Inc. are asking the U.S. Nuclear Regulatory Commission (NRC) to investigate the company's decontamination of several rooms at Isomedix's plant here between 1976 and 1980.

The employees — who left the company after a labor dispute last fall — are questioning how certain areas of the plant became contaminated with radiation after an accident at the plant at 35 Eastmans Road in 1976.

Isomedix is a firm that specializes in sterilizing medical products and treating other materials by exposing them to lasting radiation from cobalt 60.

NRC spokesmen say they are aware of most of the incidents that the former workers want investigated, but say that as far as they can tell, the plant was cleaned up properly.

John Kinneman, the chief of Materials Radiological Protection Service at the NRC's office in King of Prussia, Pa., says the agency will review the complaints of the former workers when they make a regular inspection in the near future.

The NRC was not able last week to provide exact dates for many of the incidents that followed the 1976 accident, because officials did not have time to review the company's files.

John Deitz, the president of Isomedix, openly discussed the accident and cleanup but was also reluctant to give some details because he was unsure of exact dates and because "I don't want to get into something that happened a long, long time ago."

Deitz added that the company "had gone to a lot of effort to do the cleanup right," spending "several hundreds of thousands of dollars, an amount comparable for a firm our size to what it's costing Jersey Central Power & Light to clean up Three Mile Island."

Isomedix's growth and position as a leader in the irradiation business is the subject of a feature article called "Gamma rays have a glowing future" in the current issue of Fortune magazine.

In 1976, company officials say a cobalt "pencil" — powdered radioactive cobalt encased in a double walled stainless steel rod — ruptured while it was inside a shielding pool — a deep concrete pit filled with water that absorbs the gamma rays the cobalt pencil gives off.

The company's president, George Deitz, says the firm is not absolutely certain what caused the rupture, but says it may have been caused by corrosion from fire extinguisher chemicals that got in the shielding pond when a worker put out a small fire at the plant.

According Deitz and former workers, a welder was doing some work near the shielding pond when slag hit some paper covering the pond and caught on fire.

Whatever the cause, after the ruptured pencil was discovered, Deitz said the cobalt pencils were withdrawn from the shielding pond and kept in a "hot cell" — a small concrete shielded room next to the pond.

George Berton and Frank Brazilis — the two workers who are asking the NRC to look into the cleanup, are questioning whether the company promptly reported the ruptured pencil to the NRC.

Deitz said the company did, and Kinneman, while not having complete records to review, also believes the NRC was told of the leak promptly.

While storing the cobalt pencils in the hot cell — Kinneman says it was a safe place to keep them since they are manufactured in similar rooms — Isomedix moved to clean up the water in the shielding pond using ion exchange resin filters.

Ion exchange filters remove the cobalt molecules in the water and replace them with hydrogen.

When the water was cleaned to permissible levels, it was dumped down a toilet in the plant.

This is another area that con-

> "I don't want to get into something that happened a long, long time ago."
>
> — John Deitz, Isomedix

cerns Berton and Brazilis, because they say that when a more extensive cleanup that they worked on was done several years later, the toilet and its drain pipe were found to be radioactive and removed.

After the water in the pond was cleaned, lead plates were placed over the pond and the surrounding area was used only on a limited basis for the next few years.

Deitz said the company did not finish the cleanup job at that point because of a lack of funds, but in 1979 it decided to "decommission" the area and clean it up to the point where it could turned over to the owner of the building, the Electro-Protective Corp.

When the company began the cleanup, Deitz said Isomedix expected the job would take several weeks.

It hired Chem-Nuclear Systems Inc., a Bellevue, Wash., company that specializes in cleanup work to supervise the job.

But instead of being able to wipe down the area and remove the radiation with brushes and various cleaning agents, the company was forced to use jack hammers to chip away large amounts of concrete.

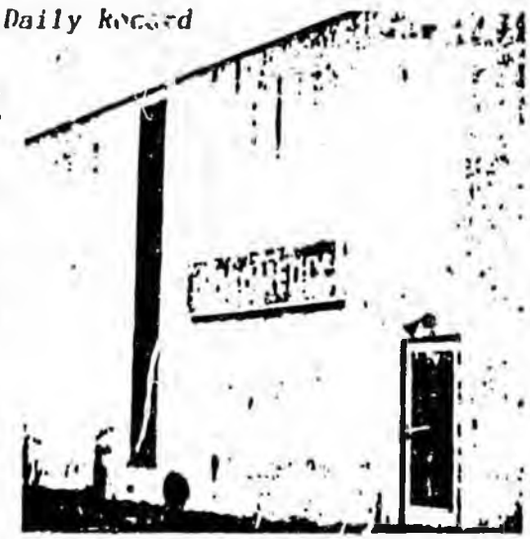
In the shielding pool, up to six inches of concrete was stripped away from the wall and floor of the pool, and the floor surrounding the pool was also chipped away, according to Deitz and workers on the job.

It was during this job that the toilet and pipe were found to be radioactive and removed.

Kinneman says the toilet could have become radioactive from the earlier cleanup of water in the shielding pond in 1976.

He says iron plate is a particularly good absorber of cobalt and might show detectable levels of radiation after absorbing the small amounts of radiation that Isomedix was allowed to dump into the sewage system.

According to a Chem-Nuclear



Isomedix plant on Eastmans Road in Parsippany where radiation accident took place.

worker, at least some parts of the toilet showed radiation levels of 25 milliroms.

Kinneman says 1 milliroms is a level used by many firms as a permissible level of radiation to monitor when a facility is acceptable for unrestricted use.

A Chem-Nuclear worker said his company became upset when after telling the company about the "hot" toilet, officials of the company tried to reduce radiation levels by washing it down with cleaning solutions that included hydrochloric acid.

He said Chem-Nuclear threatened to leave the job if the company didn't follow its advice to rip out the toilet and send it to a landfill.

Another potential problem that the workers are pointing to is several radioactive tools at the company's plant which they say were removed to another rented facility in West Orange.

Deitz says those tools were brought back to the plant and eventually shipped to a landfill, but the workers want to know if the West Orange plant was ever inspected for possible contamination.

Berton and Brazilis were two of about a half dozen workers who walked off their jobs last fall when some workers were barred from voting in an election that sought to have the Teamsters represent workers at the plant on Eastman's Road because the National Labor Relations Board classified them as supervisors.

Nuclear panel finds company violated nine regulations

By LIV OSBY
Daily Record Staff Writer

DOVER — The Nuclear Regulatory Commission found nine violations of regulations governing radiation facilities at International Nuclear Inc. here following a December 1981 leak.

Among the violations, according to an NRC report just released, was the failure of the Route 46 company to report the radiation leak. But John Glenn of the NRC Region I Office said yesterday an investigation to determine whether the company attempted to cover up the leak is not complete.

Maximum fines for each charge range up to $5,000, but Glenn said penalties have not yet been ordered.

"We're holding up the enforcement action because we're waiting to see how they progress with their cleanup of the facility," he said. The cleanup is more important."

However, Glenn said the company which used Cobalt 60 to sterilize medical equipment, will be sent a notice of violation sometime in the future.

He said the deadline for removal of all the contaminated materials is October, with the two Cobalt 60 pools used for sterilization to be removed by early September. The plant has not done any sterilizing since September 1981.

International Nuclear officials were unavailable for comment.

Other violations include possession of unauthorized radioactive materials, improper procedures during decontamination operations and no surveys of materials released from the plant. No significant evidence of ground water contamination was found, the report stated, and Glenn said the NRC concluded there was no real threat outside the building.

The report also noted that contaminated water was dumped into a shower stall at the site allowing the liquid to escape into the sewer system. Contamination of the air and the roof also was documented.

While Glenn said less than one

minute's exposure to Cobalt 60 could be lethal, the facilities are constructed so that workers and people outside the plant are not exposed to high doses levels.

There are a number of operating radiation facilities near schools, such as the research reactor at Seton Hall University, which across the street from Hamilton Field and the East Dover Elementary School, Glenn said. But he noted that the incident was "probably the worst" of its kind for such a facility.

Capsule That Leaked Cesium Not Intended For Commercial Use

Feds, State Probing DeKalb Incident

By Hal Straus
Science/Medicine Writer

The stainless steel capsule that leaked radioactive cesium at a DeKalb County sterilization plant last year was never intended to be used commercially, according to two groups investigating the incident.

The 21-inch-long capsule, and hundreds of others like it, were designed and manufactured for the storage of radioactive waste from the production of nuclear weapons.

But after undergoing tests that federal officials now acknowledge were probably inadequate, the capsules and their contents were shipped to Radiation Sterilization Inc. (RSI) and used to sterilize medical supplies.

"It's pretty clear these things should not have been used the way they were used," said Dr. Ronald Hultgren, chairman of the investigative board set up by the federal Department of Energy, which leased the capsules to RSI.

Dr. Hultgren and James L. Setser, chairman of a state task force on the incident, say the six-month leak — which cost the firm and government agencies millions of dollars — may have been caused by the way the Energy Department loaded the capsule with cesium or by impurities in the cesium that the department knew about years before the leak occurred.

Dr. Hultgren and Mr. Setser say they won't know for at least a month what caused the leak. But they say there is evidence that RSI was not adequately monitored and its sterilization process was not adequately reviewed by federal or state officials.

"There are pictures emerging," Mr. Setser said. "Certainly, there appear to have been problems with the testing and the manufacturing. I think everybody on the task force agrees there need to be some pretty major changes in the way these op-

RSI Continued on **5C**

Atlanta Constitution

February 4, 1989

RSI

From Page 1C

erations do business, the way they're regulated."

RSI opened plants in Westerville, Ohio, and in the Snapfinger Woods Business Park in DeKalb in 1985 and 1986. When first proposed and licensed by the state Department of Human Resources (DHR) and its Ohio counterpart, the plants were supposed to use capsules filled with cobalt-60 to kill bacteria on surgical gloves, sutures and other medical supplies.

The cobalt-60 manufacturing process was already in use at more than two dozen federal irradiation plants and had been studied extensively by regulatory agencies. But shortly before the RSI plants opened, the Canadian supplier delayed shipping the cobalt capsules.

In response, according to Dr. Hultgren, the firm turned to the Energy Department, whose Byproducts Utilization Program was looking for commercial firms that could use cesium-137. The cesium — a byproduct of U.S. nuclear weapons production — was stored in temperature-controlled pools of water at the Department of Energy's (DOE) reservation near Hanford, Wash.

The integrity of the cesium capsules and RSI's proposed use of them was reviewed by the Nuclear Regulatory Commission and, in Georgia, approved by the DHR. The Decatur plant began operation in 1986. On June 6, 1988, sensors at the Dekalb facility detected a cesium leak. It took six months to locate the source of the leak.

It will be eight weeks before the state task force and the DOE investigative team issue their reports about exactly how the leak occurred and what regulatory changes should be made, but both Dr. Hultgren and Mr. Setser say they have reached several conclusions.

They say the double-walled cesium capsules were designed and manufactured by the DOE to be stored indefinitely at Hanford — not repeatedly taken from a cooling pool and loaded into irradiators at commercial irradiation plant.

"These capsules were not designed, were not constructed for use in an irradiation facility," Dr. Hultgren said. "They were laying in the pool in Hanford and then somebody decided that, hey, this would be a good idea to use these things for some other purpose."

The leak may have been caused by the way the capsule was loaded. According to DOE records, the capsule was partially filled, allowed to cool, then "topped off."

That procedure would not have been a problem had the cannister stayed at Hanford, Dr. Hultgren said, but it might have been at RSI because the capsule was allowed to heat up in the irradiation process.

Experiments at DOE's Oak Ridge National Laboratory in January showed that a stainless steel beaker filled with non-radioactive cesium, then topped off, buckled slightly when heated.

The leaking cannister shows evidence of buckling — although officials still do not know if the leak occurred because of the buckling.

The leak also may have been caused by cesium impurities first noted by the DOE technicians who filled the capsule at Hanford. Dr. Hultgren said experiments show that impure cesium expands at lower temperatures than pure cesium — a difference that could buckle a capsule and cause it to leak.

The task force and the investigative team have also found that:

- RSI told the Georgia DHR during the license review that the Energy Department had the equipment to isolate and remove a leaking capsule quickly. The equipment actually had to be built after the leak was discovered.
- Other states require irradiators to have more sensitive leak-detection equipment than Georgia required RSI to have. Records suggest that the cannister could have leaked cesium for more than a month before it was detected.
- The Georgia DHR required RSI technicians to take only 60 hours of vocational and university-as trainees. Both Mr. Setser and Dr. Hultgren said that was not enough.

"Anybody can run a facility, as long as it's running well," Dr. Hultgren said. "When you're dealing with material like you're dealing with in the RSI facility, I would hope the operators are better trained than they were."

Charges that radioactive spills were covered up have also been lodged by the NRC against other plants.

And in December 1982, workers at a Dover, N.J., radiation sterilization plant found several inches of radiation-contaminated water covering the floor of a sterilization plant because a hose had blown.

Radioactive Leak Slips by Regulatory System

■ **Feb. 1, 1985** — The Nuclear Regulatory Commission (NRC) says it is not satisfied that the cesium-137 capsules are safe when they are used in the "wet storage/dry irradiation sterilization" process, in which they are intermittently hung in air and then cooled in water.

■ **Feb. 8, 1985** — The Georgia Department of Human Resources (DHR) licenses Radiation Sterilizers Inc. to use cobalt-60 in its DeKalb plant.

■ **April 8, 1985** — NRC gives Radiation Sterilizers a license to use cesium-137 capsules in wet-storage process provided the company operates a "demonstration plant" for one year and tests capsules for problems. No other facility can use the process until tests are completed.

■ **July 22, 1985** — Radiation Sterilizers, unable to get cobalt for its DeKalb plant, asks the NRC to curtail the one-year waiting period.

■ **July 25, 1985** — The NRC replies that it is still concerned about the safety of the capsules, and that the firm must proceed with operating the "demonstration facility" for one year.

■ **Aug. 5, 1985** — Radiation Sterilizers begins operation of the "demonstration facility" in Westerville, Ohio. It promises that after 12 months, a cesium capsule will be removed and tested.

■ **Sept. 6, 1985** — The Department of Energy (DOE) asks the NRC to change its mind about the one-year moratorium. The department says limited data indicate the capsules are safe in the wet-storage process.

■ **Oct. 16, 1985** — The NRC lifts the moratorium and tells Georgia officials they can process the company's application to use cesium-137 in the wet-storage process.

■ **Jan. 6, 1986** — The Georgia DHR amends the company's license to allow the use of cesium-137.

■ **Jan. 20, 1988** — Results of tests of cesium capsules from the Westerville facility show no serious problems.

■ **June 6** — A radioactive leak in the cesium-storage pool at Radiation Sterilizers' DeKalb plant is detected. Radiation-sensing devices automatically shut the plant down.

■ **June 11** — Georgia officials ask DOE to find the leaking capsule, remove it and decontaminate the area. A state and federal team is formed to carry it out.

■ **Oct. 12** — The amount of cesium leaking from the still-unidentified capsule suddenly increases tenfold. Officials, fearing the capsule may rupture, bring in new equipment and workers to find the leak.

■ **Nov. 5** — The leaking capsule is still unidentified. DOE plans to bring in still more equipment to locate the leak.

Feds Waived Tests of Device That Now Has Radiation Leak

By Charles Seabrook
Environment Writer

A DeKalb County radiation sterilization plant where a continuing leak of radioactive cesium has baffled nuclear experts for five months, was allowed to use capsules of the radioactive isotope before they were fully tested, state and federal records show.

The Nuclear Regulatory Commission (NRC) expressed concern in 1985 that plans by Radiation Sterilizers Inc. (RSI) to repeatedly immerse the capsules in water might cause corrosion and leakage of their radioactive contents.

The NRC's office of nuclear material safety and safeguards urged in February 1985 that the capsules of cesium-137, a byproduct of the nation's nuclear weapons waste, be tested for at least a year at a "demonstration facility" in Ohio before being used at the DeKalb County facility, which uses radiation to sterilize medical supplies.

But in October 1985, the federal agency waived the requirement after the Department of Energy, which leases the capsules to private firms, and the company itself asked the agency to forgo the one-year testing period.

Company officials said RSI stood to "suffer financially" if a year of testing were required. The Energy Department said limited testing results already had indicated the stainless steel, cesium-filled capsules were safe.

The NRC lifted the requirement. Four months later the Georgia Department of Human Resources (DHR) authorized the company to use 12.3 million curies of radioactive cesium — the largest inventory of radioactive material in Georgia outside the state's three commercial nuclear power plants and a research reactor operated by Georgia Tech — to irradiate surgical gloves, bandages, sutures and other medical supplies.

On June 6, two years after the plant began operations, sensors at the plant detected a leak in the pool of water holding 252 of the 21-inch-long capsules of cesium. Despite five months and at least $1 million of effort, the source of the problem is still undetected — and the leak has grown worse.

The cause of the leak — and the possibility that regulatory agencies acted too hastily in allowing the firm to use the radioactive capsules — is now the subject of an intensive investigation by state and federal authorities.

It also has prompted a sweeping review of the country's radiation sterilization industry, which operates more than 30 plants in more than a dozen states.

"We're reviewing our policy of putting such huge quantities of radioactive material into private hands," said Dr. Ronald Hultgren, who works at the Department of Energy's Oak Ridge Operations Office and heads an investigation at the DeKalb plant. "There will be a lot of lessons learned from this leak, and a number of new strict policies may emerge from all of this."

Dr. Hultgren said the results of the investigation won't be released until February, but the leak — already described by some officials as the "Three Mile Island" of the U.S. sterilization industry — already has prompted calls for major reforms in the regulation of plants that use radioactive isotopes to sterilize medical supplies and food.

Some authorities question the wisdom of allowing such plants to be located near major residential areas. Georgia officials say the uncontrolled leak of cesium at the plant has not endangered public health, but other authorities say sabotage or a major fire at the plant could spread radiation to nearby areas, which include an office park, apartments and homes.

"It doesn't seem to me to be a good idea to put these things in the middle of residential and business areas," said Dr. James Ruttenber, a radiological health expert at the national Centers for Disease Control.

Authorities say the fact that three workers at the plant — at 2300 Mellon Court in the Snapfinger Woods Business Park in north DeKalb — contaminated themselves, their homes and their automobiles with radiation before the leak was discovered is an indication that the plant did not have sufficient safety procedures to prevent outside contamination.

Cesium-contaminated carpet at the workers' homes — and a seat in one of the employees' cars — had to be ripped out and trucked to a radioactive waste burial site in Barnwell, S.C.

"The fact that workers got out of that building with radioactive contamination sticks out like a sore thumb," said James L. Setser, a Georgia Department of Natural Resources (DNR) official who heads a state task force investigating the cause of the leak.

Although the DHR licensed the firm, Gov. Joe Frank Harris put the natural resources agency in charge of efforts to stop the leak and investigate its causes.

Natural resources officials have complained that they did not even know of the existence of the plant until the leak was reported in June and radiation-sensing devices shut the operations down.

DNR is responsible for controlling radiation problems outside buildings, while the human resources agency handles radiation problems that are contained within buildings.

One of the effects of the incident at the DeKalb plant has been to bolster legislative efforts to consolidate radiation protection services in a single agency.

Meanwhile, the leak continues unabated. Last week, a team of state and federal workers brought in additional equipment to stem the radioactive cesium leak into the 25,000-gallon pool of water in which the capsules are stored.

The Atlanta Journal

FRIDAY, DECEMBER 23, 1988

Removal Of Cesium Is Delayed

DOE Hesitant to Truck Capsules Across Country

By Charles Seabrook
Environment Writer

State officials said Thursday that the 247 remaining capsules of radioactive cesium at a DeKalb County sterilization plant must be removed as soon as possible — but federal authorities said the removal may be delayed for months while they decide how to ship the capsules safely to a West Coast disposal site.

The immediate threat at the plant was resolved earlier this week when two damaged capsules — one the source of a leak since June — were taken to Oak Ridge National Laboratory in Tennessee, where scientists will try to determine what caused the damage. Both capsules had bulges, and one was cracked.

But now federal authorities are not sure how to handle the remaining capsules, which were trucked three years ago from the Hanford Reserve nuclear defense plant in Washington state and installed at Radiation Sterilizers Inc. (RSI) in DeKalb and a sister plant in Ohio. Hanford, which produced the radioactive isotope cesium-137 as a nuclear waste byproduct, manufactured the capsules.

State officials want the remaining capsules out of the plant because of the possibility that others may start leaking. The capsules at the DeKalb site represent the largest inventory of radioactive material in Georgia outside the state's three commercial nuclear power reactors and a research reactor operated by Georgia Tech.

The capsules originally were shipped to Georgia in specially designed casks to shield their deadly radiation. But Department of Energy (DOE) officials said Thursday the stubborn leak that developed last June in one of the capsules raised questions of whether stricter measures — and stronger casks — were needed to transport the capsules safely back to Hanford.

CAPSULES Continued on 4B

Capsules

From Page 1B

The capsules, each containing 47,000 curies of cesium-137, were recalled by Hanford in August, two months after a radioactive leak closed RSI, which used the capsules to sterilize surgical gloves, bandages and other medical products.

The damaged capsules were shipped in an "over-packed cask" specially made to haul them to Oak Ridge.

But the Nuclear Regulatory Commission (NRC) warned that, in light of the leak, the casks DOE intended to use to ship the undamaged capsules back to Hanford may not withstand an accident. NRC ordered Hanford to determine the suitability of the casks before shipping the capsules back from Georgia and Ohio.

DOE officials have acknowledged that they did not believe the capsules could leak radiation, and therefore they had no equipment readily available to deal with such a problem.

Ronald Gurton, director of Hanford's waste management division, said DOE will decide within the next few weeks whether it will have to develop a more suitable shipping container.

Regardless, removal of the capsules from the DeKalb plant will not begin before early summer.

The initial schedule called for 180 capsules at the RSI plant in Westerville, Ohio, to be removed by January. After that, the capsules at the DeKalb plant would have been retrieved.

Because of the delays, removal of the capsules at the Ohio plant may not be completed until late spring, at the earliest.

The effort to stop the leak and clean up the contaminated plant already has cost more than $2 million, and the cost will go up until the capsules are removed and the building decontaminated.

"We want those capsules out of the plant as soon as possible," said James L. Setser, a state Department of Natural Resources official who leads a special team investigating the leak. "We can't rule out the likelihood that something else won't go wrong with the remaining capsules, but we don't know what that likelihood is. And because of that, we want to get them out of there."

Mr. Setser said that as long as the capsules are there, the state will have to maintain a skeleton crew of workers at the facility. He said it could be a year before the plant could reopen.

Mr. Setser's task force is trying to determine the cause of the leak and decide whether stiffer regulations are needed.

An in-house investigation is trying to determine if DOE violated or bypassed basic safety guidelines in allowing private firms to use the capsules.

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Canadian-made equipment cited in El Salvador irradiation mishap

By Olivia Ward Toronto Star

Three people suffered serious radiation injuries in El Salvador last February when their Canadian-made irradiation equipment malfunctioned, according to a report obtained by The Star.

But the Salvadoran government says "human error" and not equipment was responsible for their mishap.

The men, aged 19 to 26, suffered burns and radiation sickness from exposure to cobalt sterilizing equipment at the Delmed irradiation plant in San Salvador. The company bought its radioactive cobalt material from the federal government-owned Atomic Energy of Canada Ltd. in 1975.

According to the Salvadoran plant manager, the machine operator handling the equipment had received no training, except for instructions from a manual left by AECL.

Neither Ottawa nor the Salvadorans have made the accident public, and the Salvadoran embassy in Ottawa says it has not been notified of the event.

But the incident raises questions about Canada's role as a leading supplier of both cobalt and irradiation equipment.

Irradiation involves exposing objects to radioactive gamma rays. The practice of irradiating fruit and vegetables to kill germs and lengthen shelf life, for example, is an ongoing health and safety controversy.

The Salvadoran plant involved in the accident was using irradiation to sterilize medical equipment, a common use of the technology.

Canadian officials say they first heard of the accident Feb. 10, when Delmed called for help from Nordion, an AECL spinoff company that sells and services cobalt equipment. Canadian inspectors had been kept away from the plant since 1984 by a police warning that the area was unsafe due to its ongoing civil war.

But two days after the acci-

Please see THREE/page A5

Three injured in irradiation accident

El Salvador mishap raises concern about Canadian equipment

Continued from page A1

dent a Nordion team went to El Salvador to dismantle the plant's radioactive cobalt equipment, including what technicians refer to as the "cobalt source" material, and prevent further radiation emissions.

"At that time we had no idea people had been injured," says Donna Coates, Nordion's director of public affairs. The company wasn't told until Feb. 28, she said.

The men injured in the accident were sent to Mexico City for intensive care, and a specialist team from the Radiation Emergency Assistance Centre at Oak Ridge, Tennessee, was called in by the Salvadoran government.

A medical team from the Pan American Health Organization of the United Nations is also investigating the accident.

A report from the Oak Ridge centre, obtained by The Star, showed the three injured men were exposed to dangerous doses of radiation, and one, Roque Tobar, 26, received a dose generally considered fatal

Tobar is still under the care of Mexican bone marrow transplant specialist Dr. Raphael Hurtado.

Eleven other workers were tested for radiation exposure, but plant manager Orlando Lenus said the results were negative.

"Nobody really knows how the accident happened, and the only person who does is the one who was seriously injured," Lenus told The Star's Nomi Morris in a phone interview from San Salvador.

Tobar, the only machine operator on the night shift, entered the chamber where medical equipment was being irradiated.

The plant's irradiation equipment resembles a rack of pencils, with each pencil containing a slug of radioactive cobalt. When in use, the rack of pencils is raised from a vat of water which normally shields the gamma radiation it gives off.

The pencils are supposed to safely drop back into the water when the radiation has done its job

Lenus said Tobar may have entered the cobalt chamber without a radiation monitor, not realizing that one of the 'pencils' was stuck above the water. The two other men, Jose Vasconselos and Jose Martinez, probably joined him there, and were badly burned.

'Nothing 100% safe'

"As long as there are humans involved, nothing is 100 per cent safe," Lenus said.

Lenus says he is negotiating with Nordion to replace the plant's radioactive cobalt and restart the equipment.

According to Donna Coates, Nordion's technicians believed the cobalt equipment was unsafe, and disabled it "until (Delmed) can meet safety standards and the Salvadoran regulatory authorities give clearance."

Coates said that Nordion makes a practice of inspecting equipment every 18 months, when the short-lived cobalt 'pencils' are replaced, although El Salvador's civil war prevented such inspections.

However Michael Colby, associate director of Food and Water, a New Jersey-based pollution monitoring group, says that accidents to irradiation equipment are common, and neither laws nor inspection procedures are tough enough

"In the US alone there are 38 irradiation facilities," he said "At least six, and possibly ten accidents have happened here."

Some American plants are using Canadian equipment, Colby said.

Charges were recently laid against operators of one US plant, where hundreds of gallons of cobalt-contaminated water spilled out of its container and was cleaned up by janitors and discharged into the drains and water supply.

Canada is a leading supplier of radioactive isotopes produced from rare cobalt metal, and earns more than $50 million a year from sales of irradiating equipment.

"Food irradiation isn't popular in North America, so it's been exported to the Third World," Colby said. "It's unfortunate that Canada is getting into this. It could be a real black eye."

There are no international regulations for countries that sell irradiating equipment outside their own borders.

AECL said it no longer has any connection with the Salvadoran equipment it originally sold. Nordion, an 11-month-old crown agency expected to be sold to private interests soon, says it was unable to inspect the plant until the emergency call last February.

"When we sell (radioactive cobalt) to any country we make sure it is accepted by the local regulatory authorities, and that there's a licensed radiation officer on the site," says Coates. "We do training of staff to make sure they're qualified."

But after the initial installation, she said, the safety of ongoing plant operations must be left to the countries that buy the equipment.

"We are careful not to be patronizing to (Third World) countries. "They have people who are quite adequate and well trained."

The Salvadoran plant manager admits that Tobar, who worked at the company for 18 months before the accident, had no on-the-job training.

Irradiation firm charged in radioactive water spill

NEWARK, N.J. (AP) — A federal grand jury on Tuesday indicted an irradiation company and two employees on charges of concealing a spill of radiation-contaminated water allegedly flushed down bathroom drains at the company's New Jersey plant into the local sewer system.

"There is currently no danger to the community," U.S. Attorney Thomas Greelish said in announcing the indictment against International Nutronics Inc. of Palo Alto, and two employees arising from the December 1982 spill at its Dover Township plant.

But, he added, it is "impossible" to say whether the spill, covered up partly by rigged radiation detection badges the employees were required to wear, posed a health hazard at the time.

The half dozen employees at the plant — which irradiated organic products such as liver meal for dog food to destroy bacteria, and certain semi-precious gems to enhance their color — showed no signs of sickness, Greelish said.

Named in the indictment are the company, Eugene T. O'Sullivan, 60, of San Jose, Calif., a company vice president and corporation radiation safety officer; and Bruce J. Thomas, 33, of Somerville, N.J., manager and radiation safety officer at the plant.

They are accused of conspiracy, concealing the spill, mail fraud and wire fraud in trying to hide the spill from the Nuclear Regulatory Commission.

The indictment also alleges the defendants failed to notify the NRC within 24 hours that the spill would cause more than $2,[illegible]0 in property damage and the loss of more than one day of operations.

A telephone message left at the company's headquarters was not returned.

O'Sullivan's attorney, James M. Weinberg, a federal public defender here, said his client was innocent of the charges. He said the plant was closed at the time of the spill, so the incident did not need to be reported to the NRC.

Thomas, reached at the plant, declined to comment on the indictment. He said the company has been closing down the facility for two and half years for economic and other reasons. He declined to elaborate.

Greelish said there was no way to determine the amount of water that spilled during the incident.

The spill occurred when a filter pump connected to the pool of water containing the cobalt used in irradiation was allowed to run unsupervised overnight — in violation of NRC regulations, Greelish said.

That caused radioactive water to spill onto the floor, he said.

Employees were instructed to carry the contaminated water in buckets and pour it down the plant's bathroom drains, the prosecutor added.

The company then delayed an NRC inspection and, to mask the amount of radiation released, chiseled holes in the walls and floors, filled them with lead wool and repainted over them, the indictment alleged.

Other measures taken to reduce detection included placing liver meal along the building's walls and directing employees to alter the way in which they wore their radiation detection badges so the devices recorded lower dosages, the indictment said.

Greelish added that the employees knew that the badges were being rigged.

The incident did not come to the NRC's attention until almost a year later, when several employees spoke up.

The incident required a $2 million clean-up effort, some of which was paid for by the company, federal authorities said.

Federal officials said that in the late 1950s, O'Sullivan worked at the Atomic Energy Commission, which later was divided between the NRC and the U.S. Energy Department.

Kari Abraham, a spokesman for the NRC's regional office in King of Prussia, Pa., said International Nutronics was given a license in 1981.

In October 1985, the company agreed to discontinue irradiation processes and to submit a plan on how the pool would be decontaminated, Abraham said.

Authorities Find Area Where Radiation Leaking at Plant

By WILLIAM E. SCHULZ
Associated Press Writer

ATLANTA (AP) — Inspectors have found the area where radiation is leaking inside a suburban Atlanta plant, and have virtually proven no employees were exposed to serious levels of radiation.

There has been only very minor contamination outside the Radiation Sterilizers, Inc., building, Jim Setser of the Georgia Department of Natural Resources' Environmental Protection Division, said Sunday night.

Inspectors working through the weekend found 10 employees of the company may have been exposed to radiation. Tests have showed that the blood samples from those employees were normal, Setser said. Their radiation badges showed no radiation contamination.

"If their urine tests are OK, we'll be pretty sure they're clean," he said.

Inspectors found small amounts of radioactivity on the seat of one employee's car and in the carpets of two employees' homes. The contaminated materials had been cut out and taken back to the plant for proper disposal, he said.

"The contamination was significant, but not what we would think of as a major health hazard," Setser said.

The radiation is leaking from one of more than 250 containers in a storage pool inside the building, but inspectors are still trying to determine which one.

"There are 252 stainless steel canisters, each containing 50,000 curies of Cesium 137. They are in a nest in this 25,000-gallon pool of water," Setser said Sunday night.

"One of those canisters has a pinpoint leak of some kind and the water in that pool is gradually getting more radioactive."

He said state officials and experts from Radiation Sterilizers Inc., which sterilizes medical products, are consulting with scientists across the country to try to find a way to find and stop the leak.

"We're going to meet tomorrow (Monday) to see if we have a plan" to stop it, Setser said.

The radiation leak was discovered more than a week ago.

Virtually all of the radiation is contained within the Radiation Sterilizers building, and there is no threat to public health, he added.

He said 80 percent of the packages from Radiation Sterlizers sent to businesses in the Atlanta area had been located and tested by Sunday night and none were found to be contaminated. Others are being sought nationwide.

Radiation Sterilizers sterilizes medical packaging products and ships them across the country, Setser said.

Setser said the company, which voluntarily shut down June 6, uses radioactive Cesium 137 in the sterilizing process.

The first indication of the leak was June 4, when a higher than normal level of radiation was detected in the indoor water pool where the Cesium 137 is stored, he said.

Two years' probation in nuclear spill case

NEWARK, N.J. (AP) — A former nuclear regulatory official who was convicted of covering up a spill of radioactive water at his company was sentenced to two years' probation by a judge who said the man had been punished enough.

U.S. District Judge Herbert Stern on Thursday sentenced Eugene T. O'Sullivan for concealing the spill at an International Nutronics Inc. plant in Dover. The company also has plants in Palo Alto and Irvine. O'Sullivan, 61, of San Jose, was a company vice president at the time of the incident.

O'Sullivan could have received 39 years in jail and a $26,000 fine. He was convicted Oct. 29 on charges of conspiracy, mail and wire fraud and violating Nuclear Regulatory Commission regulations.

"The crime you have committed warrants and deserves jail," Stern told O'Sullivan, who was a member of the Atomic Energy Commission, forerunner of the NRC.

"On the other hand, we sit here to do justice not only for the crime but for those who committed it," the judge said.

Prosecutors said O'Sullivan and the company concealed the December 1982 spill and ordered employees to flush the water down bathroom drains and into the local sewer system.

The jury also found the company guilty of covering up the spill, and Stern fined it the maximum $35,000.

During the trial, the government alleged that the company masked the amount of radiation released in the accident by chiseling holes in the walls and floors, filling them with lead wool and painting over them.

Other measures taken to conceal the spill included placing liver meal along the building walls and directing employees to alter the way they wore their radiation detection badges so the devices would record lower dosages.

The company irradiated organic products such as liver meal for dog food to destroy bacteria and certain semiprecious gems to enhance their color.

At the Palo Alto and Irvine plants, medical equipment is irradiated.

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ATOMIC ENERGY COMMISSION
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FOR IMMEDIATE RELEASE
(Friday, June 14, 1974)

TEXT OF ANNOUNCEMENT

Isomedix, Incorporated, of (25 Eastmans Road) Parsippany, New Jersey, informed the Atomic Energy Commission on June 13, 1974 that one of its employees had received an apparently high overexposure of radiation.

The man, chief of radiation operations for the company, was treating a drum full of plastic material with intense radiation from a Cobalt-60 source when the accident occurred, said the company.

He apparently entered the room where the source was located while the source was not completely inside steel and concrete radiation shielding, and was briefly exposed. When he realized what had happened, he left the room and summoned aid, said the company.

The man has been hospitalized. The Cobalt source, used by the company to sterilize medical and other products, has been secured and poses no threat to other workers, or to the general public. Its radiation, similar to X-rays, does not cause contamination.

AEC medical consultants are on the case, and the Regulatory Staff of the AEC is investigating the circumstances of the accident.

The company said that it appeared the normal procedure of having workers approach the door to the irradiation area with a hand-held radiation meter was not followed in this case. The facility was last inspected by the AEC on May 15, 1974, and was found to be in compliance with AEC regulations.

The State of New Jersey was notified.

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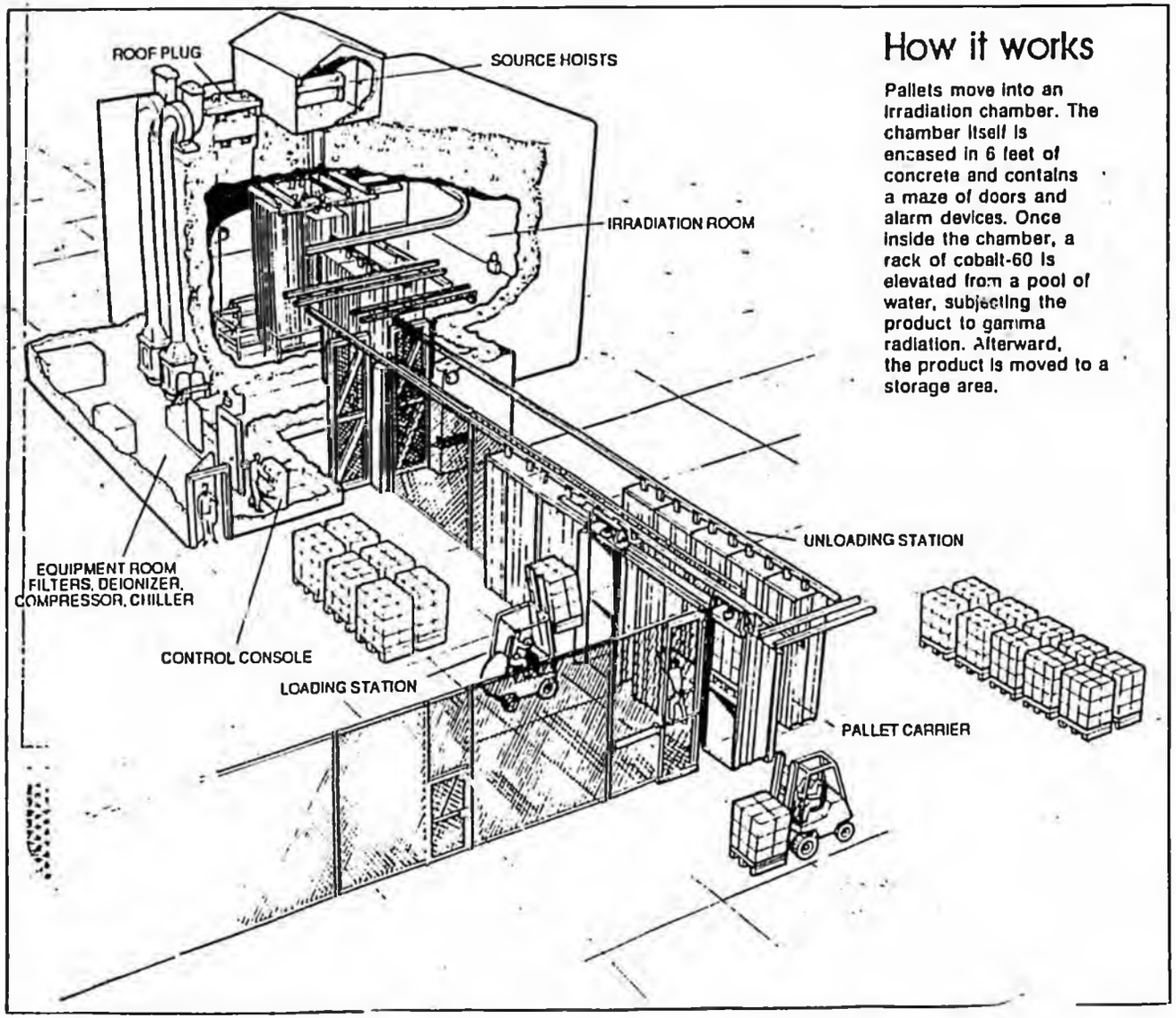
The exposure was estimated to have been 400 R, based on chromosome studies — R



How it works

Pallets move into an irradiation chamber. The chamber itself is encased in 6 feet of concrete and contains a maze of doors and alarm devices. Once inside the chamber, a rack of cobalt-60 is elevated from a pool of water, subjecting the product to gamma radiation. Afterward, the product is moved to a storage area.

NRC has recorded 54 plant accidents

The Nuclear Regulatory Commission has documented 54 accidents at 132 irradiation plants operating in 39 countries since 1974, when the NRC came into existence.

The following is a list of the fatal, near-fatal and recent accidents:

■ 1975, Stimos, Italy: A worker climbed onto a conveyor belt and by mistake exposed himself to cobalt-60. When his partner attempted to reverse the belt to bring him back, the belt instead lunged forward and the victim's entire body was exposed to the radiation. He died 12 days later.

■ 1974, Parsippany, N.J.: A 61-year-old worker was critically injured after exposure to cobalt-60 following four straight days working 10- to 12-hour shifts.

■ 1982, Norway: A service technician is exposed while trying to fix a jammed conveyor belt. He died 13 days later.

■ 1982, Dover, N.J.: Cobalt-60 contaminates a containment pool. Quantities are found in soil samples taken from areas adjacent to the plant. Six months later, a federal grand jury indicts two employees who instructed others to flush the radioactive water into the sewer system.

■ 1988, Decatur, Ga.: The Department of Energy reports a possible leak at the Radiation Sterilizers Inc. facility. Employees working in the facility received clothing and skin contamination. Boxes of medical products, irradiated at the facility, were also slightly contaminated but had been shipped from the facility.

NRC officials say circumstances leading to accidents involving fatalities have been corrected with enhanced safeguards.

NRC officials say circumstances leading to accidents involving fatalities have been corrected with enhanced safeguards.

Most accidents, they say, occur when workers circumvent safety measures.

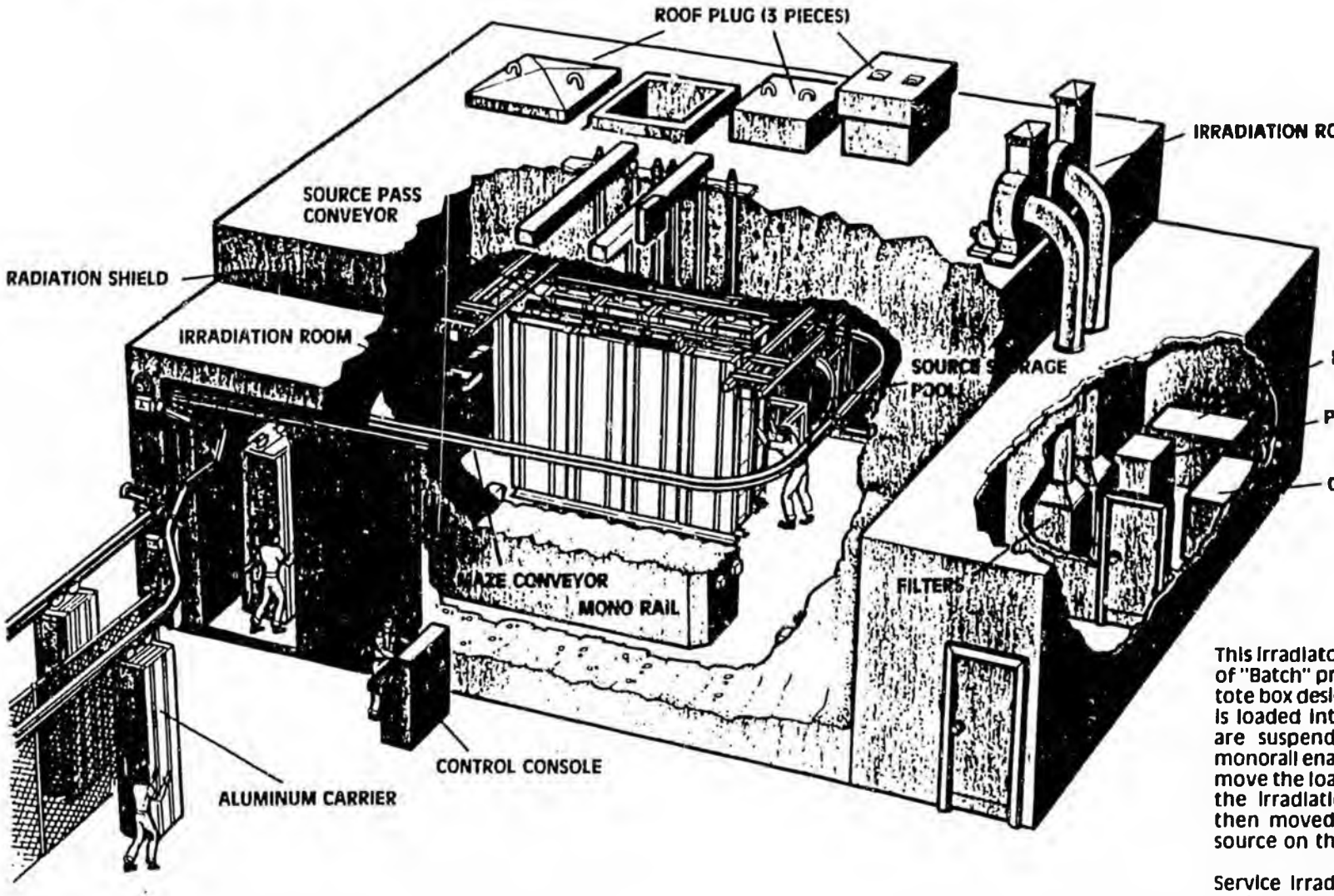
"The problem with most facilities is that they rely on the human element," said Steven L. Baggett, health physicist with the NRC. "Either through malice or some other reason" workers bypass procedures, he said.

In Florida, the state Department of Health and Rehabilitative Services' Nuclear Materials Section would perform annual, unannounced inspections of the Vindicator facility.

HRS Nuclear Materials Section Director Dan Nash said that as part of its licensing procedure, it will require Vindicator to provide the measures Vindicator would take in the event of an accident.

Nevertheless, Commissioner Andy Scrocca said the possibility of an accident is his main concern. "We have no facilities to handle this," he said. "I spoke to the fire chief, he didn't know what to do in the case of an accident."

CARRIER IRRADIATOR-MANUAL BATCH LOADING



This irradiator provides another metho of "Batch" processing. It differs from th tote box design in that the boxed produ is loaded into aluminum carriers whic are suspended from a monorail. Th monorail enables the operators to rapid move the loaded carriers into and out c the irradiation room. The carriers a then moved automatically around th source on the same monorail system.

Service irradiation companies find th design especially relevant to their need Batches of diverse product and box si can be proces ed quickly with goo packing efficiency.

Upgrading to an automated facility a inclusion of an incremental Dose syste is possible and re t to applications

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New York, N.Y. 10012

THE VICE PRESIDENT
AT THE U.S HEADQUARTERS
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THIS IS THEIR COMPANY
POLICY
4-6-90

BURRELLE'S

Spices company decides against using irradiation

By Clay Harris, Consumer Industries Editor

McCORMICK, the world's largest supplier of spices, has decided not to use the controversial process of irradiation.

Its plan to use steam pasteurisation to ensure the purity of spices may play a significant role in determining whether food irradiation succeeds commercially in Europe.

Irradiation involves bombarding food with gamma rays, electrons or X-rays to kill bacteria or prolong shelf life. The UK Government plans to legalise its use for all foodstuffs later this year, but it is banned in West Germany, while the European Community is considering its position.

The European Parliament has signalled its opposition to allowing the use of irradiation on any food product except herbs and spices.

McCormick is building a new plant on Merseyside which will have the capacity to treat all the spices used in Britain, as well as to supply a large proportion of demand from elsewhere in Europe.

The US-owned company, which accounts for more than half of UK retail sales of spices, will offer to treat spices for competitors under contract. Its use of a natural process, using steam under pressure, is likely to prove a competitive advantage against any rival suppliers which use irradiation.

Dr Johannes Friedrich Diehl, director of West Germany's Federal Research Centre for Nutrition, said his institute had tested alternative methods to the irradiation of spices, including heat. He said if the European Parliament succeeded in having the use of irradiation confined to herbs and spices, "that's the end of food irradiation in Europe."

Spices are often dried in conditions that lead to contamination by insects or other sources. Proponents of irradiation see spices as an ideal product on which to apply the process because the main alternative method, fumigation with ethylene oxide, uses a mutagenic gas and is forbidden in many countries. Britain's ban on ethylene oxide takes effect at the end of 1990.

Mr Roger Jones, McCormick's UK manufacturing director, said the company had decided against irradiation primarily on cost grounds. "But we would have been fools to fly in the face of the consumer reaction to irradiation," he added.

International Organization of Consumers Unions
Regional Office for Asia and the Pacific
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"Consumer Reports" is published by the American affiliate

The Executive Director
Florida Citrus Commission
PO Box 1240
Fort Pierce, Florida 34954
U S A

2nd November, 1989

Dear Sir,

It has been brought to our attention that Vindicators of Florida is planning to build an irradiation facility to irradiate agricultural produce from Florida, particularly citrus fruits.

The International Organization of Consumers Unions (IOCU) is a federation of over 160 consumer groups in some 70 industrialised and developing countries worldwide. IOCU has Consultative Status Category 1 with UN ECOSOC, as well as official status with several specialised UN agencies like WHO, FAO, UNEP, UNIDO, etc. IOCU is also a co-founder and key actor in some 20 issue-oriented international coalitions of citizens groups working on specific issues of global consumer and environmental concern, including food irradiation. In December 1988, IOCU helped co-found Food Irradiation Network (FIN), a global coalition of like-minded citizens groups and individuals opposed to food irradiation unless and until all outstanding issues surrounding the technology are fully resolved and subject to public scrutiny.

At its 12th IOCU World Congress held in Madrid, Spain, in September 1987, the IOCU General Assembly unanimously adopted a resolution which called for "a worldwide moratorium on the further use and development of food irradiation, until there is a satisfactory resolution of issues of nutrition, safety, labelling and detection". The resolution also called upon "scientists, governments and the food industry, the world over, to research into more desirable methods of food irradiation". A copy of the full text of the aforesaid resolution on food irradiation is attached for your information.

The IOCU position on food irradiation has since been endorsed by environmental, trade union and other citizens groups worldwide at various international fora, most recently at the IV Bienniel Congress on the Fate and Hope of the Earth held in Managua, Nicaragua (see attached copy of the Managua resolution on food irradiation).

...2/-

SEAFOOD IRRADIATION

FOOD INSTITUTE REPORT

FAIR LAWN, NJ
WEEKLY 6,000

MAR 17 1990

-2705 BURRELLE'S CS

9795 **IRRADIATED SEAFOOD?:** Alpha Omega Technology, Inc., 1279 Route 46 East, Parsippany, NJ 07054, has filed a petition with the Food and Drug Administration (FDA) proposing that the additive regulation *Ionizing Radiation for the Treatment of Food* be amended to provide for the safe use of a source of radiation to irradiate shellfish and finfish for the purpose of extending shelf life and to control infection of microorganisms and parasites. For more information, contact Clyde A. Takeguchi of the Center for Food Safety and Applied Nutrition at (202) 472-5740. — Mar. 15, 1990, 55 FR 9772.

THE PACKER MARCH 3, 1990

Irradiation plant planned

NOGALES, ARIZ. — Ground breaking for a produce irradiation plant at the border is scheduled to begin before June, a principal in the deal said Feb. 22.

Ray MacNamara of Emergent Technologies Inc., Pleasanton, Calif., said the irradiation facility, with a $28 million budget that includes construction and the first 18 months of operation, could be open by the end of the year.

Parent company McConnell-Peel Resources Ltd., Vancouver, British Columbia, has signed an agreement with the state to lease land along the Mexican border near the crossing that most trucks use, he said. The company had considered locating on a square-mile plot east of the city, said Rebecca Bregen, executive director of the Nogales-Santa Cruz County Chamber of Commerce.

Jim Soudriette, owner of The Galaxy Organization, a management consulting firm, said he introduced company representatives to businessmen and politicians who might be involved in approving the site. Soudriette is a minor shareholder in the Canadian company.

He predicted the plant may be opposed by some citizens and said one Tucson man has written treatises on the subject.

"Radiation is a psychological problem," he said, referring to the frightened response the word often elicits.

And shippers are unsure the facility will be built, considering that resident opposition might be just as strong. Shippers also questioned the necessity of the facility.

But Soudriette said in December that a large shipper in Nogales has committed to packing produce from the plant, which would irradiate fruits, vegetables and seafood.

The process, which Soudriette likens to getting X-rays at the dentist, is designed to kill microorganisms that infest food products. He said irradiation has been used for years on spices and some cereal products.

ARIZONA PLANT TO IRRADIATE SEAFOOD

Honolulu Star-Bulletin

Sept. 25, 1986

Neighbor Isla

Hilo Group Joins National Coalition to Oppose Papaya Irradiation Project

By Rod Thompson
Big Island Correspondent

HILO — A national organization planning a boycott of papayas if they are irradiated has supporters on the Big Island, where growers will meet tomorrow and discuss the need for the controversial technology.

The East Hawaii Coalition to Stop Food Irradiation, which opposes irradiation of food on health and safety grounds, contends that the irradiation consulting firm hired by the state is too closely allied with the U.S. Department of Energy, which is promoting commercial irradiation.

The group, which is the local chapter of the national Coalition, questions health and safety aspects of irradiation. The U.S. Food and Drug Administration approved irradiation of foods in April following two years of study and public comment.

The FDA's study of irradiation followed action by the U.S. Environmental Protection Agency in 1984 banning the sale of fruit treated with ethylene dibromide, a chemical insecticide widely used by fruit growers and also a suspected carcinogen.

The $10 million-a-year Hawaii papaya industry's search for alternative fruit-fly controls led to the double-dip method now in use. Papayas are dipped in hot and warm water to kill flies, but the treatment has been criticized as disrupting harvesting schedules.

PAPAYA Administrative Committee manager Robert Souza says double dip is "OK" but "we need something better." Irradiation will be a major discussion topic at tomorrow's Hawaii Papaya Industry Association conference.

Concerned about the papaya industry's future, the state Legislature this year appropriated $200,000 to study the feasibility of irradiation to kill fruit flies.

The Big Island group contends CH2M Hill, the international science, engineering and planning firm recently hired by the state to study the feasibility of papaya irradiation, may have a conflict of interest in the matter.

The firm is also under contract to the New Mexico office of the federal Energy Department's Civilian Byproducts Utilization Program, which is hoping to develop commercial uses

Turn to Page A-18, Col. 1

RADIATION SPILL SITE—Radioactive material lay on the ground outside this state Agriculture Department building for 13 years until it was cleaned up in 1980. —Star-Bulletin Photo by Dennis Oda.

Radioactive Leak on Oahu Disclosed

By Rod Thompson
Star-Bulletin Writer

HILO — Radioactive material lay on the ground outside a state-run irradiation facility in Honolulu for 13 years until it was cleaned up in 1980, according to the East Hawaii Coalition to Stop Food Irradiation.

Although the public never was notified of the leak, no injuries resulted, according to a state Department of Agriculture official.

The contamination outside the building followed spillage of radioactive cobalt-60 inside the Hawaii Development Irradiator building at Fort Armstrong in 1967, Coalition spokeswoman Kathy Dorn said.

The coalition planned to disclose the incident at a press conference on the Big Island today.

Dorn cited the spill as an example of the danger an irradiator can pose to a community. A commercial irradiator is being considered for construction on the Big Island.

THE HAWAII Development Irradiator was operated by the state Department of Agriculture with federal money from 1957 to 1971, according to state documents obtained by Dorn. Dismantling of the facility was delayed until 1980, the documents show.

The facility irradiated papayas for studies of how well they held up in shipment and how wholesome they were, said Department of Agriculture administrator Masao Hanaoka.

Hanaoka confirmed that nine curies of cobalt-60 spilled inside the facility. He became safety officer for the facility after the spill was cleaned up, he said. Nine curies of cobalt-60 could give the equivalent of 180 chest X-rays per hour, said Brian Sprinstock of Food Irradiation Response in Santa Cruz, California.

Sprinstock estimated the material on the ground outside the facility could give the equivalent of two chest X-rays per hour when it was cleaned up in 1980, and eight chest X-rays per hour in 1967, before its strength declined.

No injuries are known to have resulted from the spill, Hanaoka said.

THE SPILL was due to defects in the manufacture of steel capsules which contained the cobalt, Hanaoka said. The spilled cobalt was confined to a pool of water used to shield workers from radioactivity, he said.

Some of that water washed onto the ground when a lead cask containing the damaged capsules was removed in 1967, Hanaoka said.

The soil contamination was discovered when consultant Ralph M. Baltzo decontaminated the entire facility in 1980, Baltzo said in a report to the state Department of Agriculture.

Although the radiation spillage was never publicized, Hanaoka said, there was no coverup. No laws were violated, and state and federal officials "didn't think it was that much of a hazard to the public," he said.

Irradiation opponent Dorn disagreed about the danger. A similar spill at a proposed Big Island food irradiator could be worse if water soluble cesium-137 is used there instead of cobalt-60, Dorn said.

A cesium 137 leak "would be immediately washed into the groundwater," Dorn said. "It would inevitably lead to higher rates of cancer, birth defects, and damage to peoples immune systems, making them more susceptible to infection," she said.

Dangerous Chemical and Biological Effects Seen

By Rod Thompson
Big Island Correspondent

HILO — A Big Island group contends irradiation produces dangerous chemical and biological changes in treated food.

The charge by the East Hawaii Coalition to Stop Food Irradiation flies in the face of safety assurances from the U.S. Food and Drug Administration, which in April approved irradiation of fruits and vegetables to rid them of insect pests.

The state of Hawaii and papaya growers are currently considering gamma-ray irradiation as a means of controlling fruit-fly infestation.

The FDA's green light for food irradiation followed more than two years of deliberation and review of thousands of written comments of proponents and opponents.

The idea of food irradiation may be new to most consumers but research in the area has been going on for more than 40 years, much of it by the federal government. America's astronauts have been eating irradiated food almost from the beginning of the space program.

The FDA reviewed more than 441 studies of possible poisons in irradiated foods but concluded only five studies were done properly by 1980 standards, according to the Federal Register.

The five studies showed "no adverse effects from the irradiated foods fed to test animals."

BESIDES setting maximum radiation levels, the FDA also spelled out labeling requirements for irradiated foods for the next two years.

Labels of packaged foods sold in retail stores will have to clearly state they have been treated with radiation. They also must have a special logo, or symbol, to inform shoppers they have been irradiated.

Retailers also will be required to identify fresh fruits and vegetables that have been treated with irradiation.

A recent British government report says laboratory animals are increasingly being fed entire diets irradiated at 1 million to 5 million rads.

The reason is "the beneficial effects which have been noted in the general health of animals fed irradiated diets," said the report, circulated here by the state Department of Planning and Economic Development.

THE FDA authorized irradiating fruits and vegetables with up to 100,000 rads, a unit measuring absorbed radiation. The permitted dose is 100 times the level needed to kill a human being.

The maximum dose is not needed for papayas, says University of Hawaii food engineering professor James Moy, who studied papaya irradiation in the late 1980s.

Moy says he holds the "unofficial world's record" for eating irradiated papayas and is still healthy.

The U.S. Animal and Plant Health Inspection Service has yet to decide whether to require 26,000 rads to kill fruit flies, or 15,000 rads to leave them alive but sexually sterile, Moy said.

There is general agreement that 100,000 rads or less does not produce secondary radiation in foods. But opponents say irradiation produces dangerous by-products in treated foods.

One of the concerns of opponents is "unique radiolytic products" — URPs — which are chemicals formed by radiation breaking apart natural chemicals in food.

The FDA contends these substances are similar to natural chemicals in food, and at three parts per million, their concentrations are too low to test their effects.

MOY SAID the biggest danger of URPs comes from irradiated fats. Papayas have practically no fat, he said.

The Coalition also says irradiation may not kill microorganisms that cause botulism, while killing those that cause food to spoil, warning people not to eat it.

The warning microorganisms are not killed at the permitted radiation levels, the FDA has said.

The East Hawaii Coalition cites a 1980 FDA study which found certain irradiated fungi greatly increased their production of the cancer-causing chemical aflatoxin.

Moy says the fungi which produce aflatoxins don't grow on papayas.

Opponents say irradiation destroys vitamins. The FDA said "there are no nutritional differences" between unirradiated food and food irradiated at the the permitted level.

Papayas are high in vitamin C. The Council for Agricultural Science and Technology said irradiation changes "a significant proportion" of vitamin C to a related chemical which has "almost the same vitamin C value."

Radiation of Papaya Is Opposed

Continued from Page A-10

radiation facilities, said Yoshihara.

Maurice Kaya of CH2M Hill's Honolulu office denied any conflict of interest: "By working through the Department of Energy, we bring experience, knowledge, and credibility to the project.

"I like to think we were selected on the basis of our qualifications," he said.

The East Hawaii chapter is part of the National Coalition to Stop Food Irradiation, Dorn said. The local chapter consists of a core group of eight people assisted by about 40 others, with little formal structure, she said.

The national Coalition is allied with other groups such as Food Irradiation Response of Santa Cruz, California, and the Health and Energy Institute and the Health Research Group of Washington, D. C., she said.

While disagreement on the feasibility of papaya irradiation remains, people interested in it are adjusting their attitudes.

AMFAC, THE state's largest papaya packer, has softened its stand against irradiation. Amfac Agribusiness president Dennis Teranishi now says it is proper to consider radiation. Four months ago he said, "I don't want to fool with it."

Teranishi noted the idle lands formerly used for sugar production by Amfac subsidiary Puna Sugar Co. He suggested irradiation may be useful in processing any alternate crop which the company can find for those lands.

Former state agriculture director John Farias says he has stopped working on a private irradiation project for the Big Island. Two officers of a corporation he was working with, International Nutronics Inc. in California, are under federal indictment on charges related to allegedly covering up a 1982 radiation spill.

Hilo Group Opposes Radiation

Continued from Page One

of nuclear-reactor wastes.

Ron Holton, program coordinator in Albuquerque, said CH2M Hill is providing technical expertise on irradiators to that office.

A CH2M Hill subsidiary, Isotech, last year began operating an irradiator in Colorado for medical instruments.

A DIFFERENT contractor provides expertise to the federal department's Richland, Washington office, which oversees the by-products program in Hawaii.

Karen Wheeless, spokeswoman for the Richland office, said the purpose of the program is to demonstrate the economic and technical feasibility of irradiators.

"Initially we're looking at cesium" as the radiation source for the irradiators, she said.

The Big Island group is opposed to using radioactive cesium 137 because it would be used in the form of a water-soluble salt, increasing the dangers in the event of a spill, said spokeswoman Kathy Dorn.

An accident could result in the salt being dissolved in the Big Island's ground water if a cesium-based irradiator is built here, she said.

Since cesium-137 is a waste product from making plutonium for nuclear bombs, irradiation opponents also see the government's byproducts utilization program as a way of creating a demand for cesium, so more plutonium will be processed for bombs.

THE GOVERNMENT has no plans to reprocess plutonium and cesium-137 from stockpiled wastes, Wheeless said.

Takeshi Yoshinara, head of the energy division of the state Department of Planning and Economic Development, said CH2M Hill was selected because it was the most qualified of seven applicants.

The primary business of the other applicants is operating ir-

Turn to Page A-11, Col. 1

New Jersey Daily Record

Radioactive Responsibility

OCT 2 1977

By JAN BARRY

If there was a serious radiation accident anywhere in the world this year which could have been prevented, it was the recent exposure of a worker at Radiation Technology Inc. in Rockaway Township.

When residents in the area raised safety questions about the plant last fall, local reporters were assured by company president Dr. Martin A. Welt and a spokesman for the federal Nuclear Regulatory Commission that precisely the kind of accident which occurred Sept. 22 could not happen.

Dr. Welt, a nuclear physicist formerly with the Atomic Energy Commission, informed reporters at a press conference in the plant nearly a year ago and in a subsequent tour of the radiation area that his industrial radiation operations were entirely safe and his employees protected from accidental exposure.

Learning of the 1976 accident at Isomedix Inc., Parsippany, in which worker William McKimm was exposed to a potentially lethal level of Cobalt 60 radiation, I went to the NRC Region 1 headquarters in King of Prussia, Pa., last October to review the records of that case and to ask whether a similar accident was possible at the Rockaway Township plant.

Public affairs officer Karl Abraham, who blamed the Isomedix accident on a "lack of knowledge" by key personnel, including the exposed operator, of the function of the remote alarm defeat switch," said the Radiation Technology plant design would not allow a worker to enter the radiation area and have an unexpected encounter with a highly lethal basket load of Cobalt-60 "pencils" in the exposed position above the protective pool of water.

Should such an accident happen, Abraham said in a subsequent interview, the amount of Cobalt-60 at Radiation Technology could kill a person fully exposed to it "in 12 seconds."

Abraham emphasized, however, that the federal agency is "in the preventive maintenance business" and that its regulations for the radiation industry provide "an enormous margin of safety."

Yet, the accident which couldn't happen at Radiation Technology happened within a year of these official assurances.

That it could happen was clearly the responsibility of the regulatory agency to do everything in its power to prevent.

Indeed, last January the NRC slapped the radiation firm with $4,200 in fines for nine violations of federal radiation safety standards uncovered in last fall's investigation.

NRC officials ordered Dr. Welt to correct the violations and to submit a report describing how he intended to "strengthen management control of your licensed operations to assure a strong radiation safety program for the protection of your employees and the public."

In light of the NRC special investigation, fines and orders, how was it possible only months later for Michael Pierson to walk right into the radiation chamber while the Cobalt-60 was exposed?

The question the public and plant employees clearly have a right to call nuclear regulatory agency officials on the carpet for has yet to be answered.

Daily Record Staff Photo

This International Nutronics Inc. plant in Dover is under probe.

OCT 13 1981

Dover radiation leak investigated by NRC

DOVER — The Nuclear Regulatory Commission says it may take months before it can confirm or deny charges that a Route 46 plant covered up a radiation leak nearly a year ago.

The leak was discovered on Sept. 30 by the NRC, which notified town officials on Oct. 6, said Dr. John Glenn of the commission's Region 1 office in Pennsylvania.

Glenn said whether International Nutronics Inc. concealed the December 1980 leak of Cobalt 60 "will be determined later" since inspection of the site could go on for months. Company officials were not available for comment yesterday.

Glenn said that while no fine has been determined yet, the usual fine for such a leak ranges from $400 to $8,000. If a coverup is found, he said, any fine could be increased.

The levels of radiation found in the soil and water inside and immediately surrounding the plant are "slightly over Results," Glenn said. And while studies are continuing to determine if employees or ground water supplies have been contaminated, he said the levels found so far are not harmful.

The leak came to light after the regulatory commission routinely inspected the plant, which uses radiation to sterilize pharmaceutical equipment, because the company is closing, he said. Normally, such inspections are done yearly or biennially, depending on what is found, Glenn said. The plant has been at the site since 1970, he said.

"The fact that (the company) did not call the NRC immediately is the scary part," said Mayor Aldo Ciccheti. "Who knows if it ever happened before?"

The incident is evidence such facilities should not be located in densely populated areas, he said, adding that once the building is vacated he will discourage a radiation facility at the site or elsewhere in town.

Officials also are concerned over possible hazards in case of fire, because water could spread the contamination, and 10,000 gallons of propane and an unknown amount of fuel oil border the plant.

Man To Blame For Own Accident

By ROBERT SCOTT

ROCKAWAY TWP. — A man exposed to large amounts of radiation in an accident at Radiation Technology is partly to blame for his own accident, a spokesman for the federal Nuclear Regulatory Commission says.

Karl Abraham, public information officer for the commission, said the accident could have been avoided if the worker, Michael Pierson, 32, had been carrying a personal radiation survey instrument.

Asked if the accident was partially Pierson's fault, Abraham replied, "his fault in conjunction with others." Abraham did not mention Pierson by name since the NRC has refused to confirm his identity.

Pierson has remained in St. Barnabas Hospital in satisfactory condition since the Sept. 27 accident.

Abraham said if Pierson had been carrying a radiation survey instrument and regularly reading and using it, he never would have entered the room where he was exposed to an unshielded Cobalt 60 source.

The instrument would have revealed the presence of intense radiation, Abraham said.

Abraham has estimated Pierson remained in the room about 25 seconds and would have received a fatal radiation dose had he remained there another 30 seconds.

Pierson was placed in "reverse isolation" at St. Barnabas to prevent contact with disease-bearing germs since his bodies natural defenses may have been destroyed by the radiation exposure.

The firm's license, suspended the day of the accident, was partially restored on Monday.

There are two rooms which Radiation Technology uses to expose various substances to radiation. The one involved in the accident remains closed. The other, where wood is exposed to a Cobalt source which is kept under water at all times, can now be used again.

Abraham has cited two other factors, both violations of commission regulations, as having helped contribute to the accident.

The door to the room Pierson entered had been removed from its hinges and a safety lock which should have prevented anyone from entering the room while the cobalt was exposed, had been disconnected.

Abraham said the commission considers these two violations serious because they were intentional acts involving "willful disregard" of regulations.

Nutronics denies cover-up of leak

By LIV OSBY

Daily Record Staff Writer OCT 15 1981

DOVER — An official of International Instruments Inc. denies there was a cover-up of a radiation leak that occurred nearly a year ago at the Route 46 plant.

"At no time did we attempt to cover up the leak," said Gregory Parker, corporate counsel and vice president of the California based company.

Parker said the leak was the result of a broken rod which allowed Cobalt 60 to enter a pool in 1976, which was immediately reported to the Nuclear Regulatory Commission. The break was repaired, he said, but recurred in October of 1980 when the commission was notified again.

"The NRC accepted our plan for repair and cleanup and for the last year we're been working on it," Parker said.

And when the discovery of low level radiation contamination was made at the plant again this past September, he said the NRC was notified once again.

But Dr. John Glenn of the NRC Region 1 office reiterated his earlier comment that the leak was discovered Sept. 30 during a routine inspection ordered because the facility was in the process of closing. He also said the commission was not notified of the December 1980 leak and that it was the NRC which informed the town of the leak on Oct. 6.

"We didn't notify the town because it is our belief there was no public health hazard," Parker said. "If there had been any question of a hazard, we would have notified the town immediately."

But Mayor Aldo Ciccheti said, "Anytime there is a potential for a hazard the town should be notified. It is our right to know."

Parker said the plant is being shut down because the loss of work during the cleanup would not justify its reopening and because headquarters decided to concentrate its efforts on the West Coast.

HEALTH & ENERGY INSTITUTE

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CESIUM-137 FACT SHEET

Cesium is a silver-white, soft, malleable element of the alkali metal group with an atomic number of 55 and an atomic weight of 132.9. 1 Cesium-137 is a radioactive isotope of cesium with an atomic mass number of 137. Cesium-137 is a fission product created by nuclear explosions or nuclear reactors.

A half life for a radioactive isotope is the time in which half of its radiation is released, and the half-life for cesium-137 is 30.5 years. 2 That means that in 30.5 years, half of the energy of cesium-137 will be released, and in another 30.5 years half of the remaining energy will be released, and so on. Cesium-137 is considered dangerous for 300 years.

As cesium-137 decays, it gives off gamma rays of intermediate energy and beta rays of intermediate energy. 3 Gamma rays are very penetrating, and can pass through walls, clothing and our physical bodies. Shielding of several inches of lead or several feet of concrete is needed to stop gamma rays. 4 Beta radiation is particulate radiation that is not very penetrating. Beta radiation can penetrate the outer layers of skin, and at least a quarter of an inch of aluminum is needed to stop it. The main health hazard to humans from beta radiation occurs when it gets inside the body, where it can constantly bombard living tissue. A mere 77 microcuries (a micro curie is one millionth of a curie) of ingested cesium-137 will result in a dose to the whole body of 10 rads in the first year. 5 (A dose of 10r is twice the dose allowed for workers and 25 times the dose allowed for the general public from the nuclear fuel cycle.)

Radioactive isotopes can concentrate in the food chain. Cesium-137 is chemically similar to potassium and will spread throughout the soft tissues of the bodies of fish, wild and domestic animals, and humans. Animals and people retain more cesium-137 than potassium, so as cesium-137 moves up the food chain, higher cesium-potassium ratios occur at each level. 6 Pathways to humans for cesium-137 include plants to cows to milk and plants to meat. Cesium-137 is likely to lodge in muscle, the spleen, the liver or other parts of the body. 7

Cesium-137 inventories in the United States have been estimated by the Department of Energy as follows:

Hanford Reservation, Washington: As of June, 1984, a total of 77 million curies existed, encapsulated in 1575 capsules. Another 38.5 million curies are projected from future Purex wastes by 1991.

Savannah River Plant, South Carolina: As of January, 1983, 102 million curies were present at the Savannah River Plant, and another 109 million curies is projected by 2001.

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1 Websters New Collegiate Dictionary, pp.183 & 368 (1977).
2 V. Brodine, Radioactive Contamination, 166 (1975).
3 Ibid.
4 J. Stellman & S. Daum, Work Is Dangerous to Your Health, 147 (1973).
5 V. Brodine, op. cit. 2 at 161.
6 Ibid. at 38-39.
7 Ibid. at 168-169.

Butterworth says city can't restrict food plant

By BILL HEERY
Tribune Staff Writer

MULBERRY — Cities cannot use zoning laws to ban businesses that use radioactive materials from operating within their boundaries, Attorney General Bob Butterworth said this week.

Mulberry City Attorney Frank Comparetto Jr. had asked for the opinion in light of a Plant City company's proposal to build a $6.2 million food irradiation plant here.

In his request, Comparetto said most city commissioners objected to the business being located within the city because of potential hazards associated with radiation.

Butterworth's opinion was based on the 1983 Florida Radiation Protection Act, which designates the state Department of Health and Rehabilitative Services (HRS) as the agency to administer a statewide radiation protection program.

That act prohibits counties and cities from regulating the possession, use or transportation of radiation sources.

While cities can use zoning laws for certain health, safety and general welfare objectives, the act prohibits them from banning sources of radiation, states the opinion, issued Monday.

Comparetto, through a secretary, declined to comment on it Wednesday.

Vindicator of Florida Inc. wants to build the irradiation plant in an industrial park just west of Prairie Mine Road. The plant would use cobalt 60 to produce small doses of radiation to kill microorganisms and to prolong the shelf life of certain foods.

Opponents contend it would pose an environmental danger and that the long-term effect of eating irradiated foods is unknown.

The property, annexed into the city last year, is zoned for general industrial use — the county zoning it had before annexation. That zoning would permit the irradiation plant, City Manager Floyd Woods said Wednesday.

Mulberry annexed the property as part of a plan to expand its existing industrial park. Under Florida law, more stringent zoning cannot be placed on annexed property unless the property owner requests a zoning change, Woods said.

The City Commission Feb. 7 approved an ordinance placing a moratorium of as much as one year on issuing building permits

See MULBERRY, Page 10B

Mulberry plans to keep moratorium

■ From Page 1B

for food irradiation plants and other businesses that store or use hazardous materials.

The moratorium was to give city officials time to learn more about the irradiation process and to research the legality of banning such businesses within city limits.

Woods said the attorney general's ruling will not affect the moratorium since the opinion is not law.

"My opinion is that the moratorium is in effect, and it's legal until someone challenges it in court," he said.

Helga Druguet of Eaton Park, spokeswoman for the Polk County Coalition to Stop Food Irradiation, a grass-roots organization with about 12 members, said she disagreed with the attorney general's opinion. So did Mulberry resident Jan Privett, another plant opponent.

"You're talking about home rule," Druguet said. "Every municipality in the United States can control what they allow to come into their city."

Said Privett: "I really think there's a way that a city can determine its future, just like I believe the food they irradiate should be labeled so that people can make the choice."

Mulberry City Commissioner Andy Scrocca, one of the most outspoken opponents of the plant, said the opinion is only that, "and the attorney general of Florida is entitled to his. I just wish they would listen to the opinions of the people in the city of Mulberry. Five hundred people attended a meeting — one of the largest we've ever had — to protest" the plant.

Sam Whitney, president of Vindicator, said he was not surprised by Butterworth's opinion because "the law is very clear." He said HRS' Office of Radiation Control approved the proposed site for the irradiation plant last November.

A Short History of Trouble

Irradiation Hall Of Shame

The industrial irradiation industry is relatively new. Created in the mid 1970's to sterilize medical supplies and packaging materials, this young industry has had a troublesome safety record. Problems have included radioactive leaks, spills, worker overexposures, failed or bypassed safety systems and failure to report to the Nuclear Regulatory Commission. The state of New Jersey hosts many of these problem plants. What follows is a summary of the 13 most significant incidents which have occurred in the last 12 years.

JUNE 16, 1974 *Chief of radiation operations at the Isomedix irradiation plant in Parsippany, N.J. received an estimated 400 rem radiation dose, when he failed to take proper safety precautions. William McKinn barely survived the one or two second overexposure to 147,000 curries of cobalt-60. Mr. McKinn was in critical condition for one month before recovering.*

1976-1980 *In 1976 a double encapsulated cobalt-60 source was found leaking at the Isomedix irradiation plant in Parsippany, N.J. Following ion-exchange filtration, the source pool water was dumped down the plant's toilet. An extensive cleanup program followed which involved jackhammering concrete from the walls and floor of the source pool. During cleanup operation, Chem-Nuclear Corp. found the toilet and toilet pipe to be radioactive. Eventually, the toilet, tools, and parts of the source pool were shipped to a radioactive burial ground.*

MARCH 14, 1977 *The Nuclear Regulatory Commission fines Radiation Technology Inc. [RTI] $4050.00 following an October 1976 inspection which identified 10 violations of RTI's license. Violations incuded, failure to report a leaking cobalt-60 source, failure to adequately evaluate radiation doses to workers, disposing of radioactive material as normal trash and failure to provide required training to employees.*

SEPTEMBER 23, 1977 *An employee at the Radiation Technology Inc. [RTI] plant in Rockaway, N.J. entered the radiation cell for 10-20 seconds and received a whole body dose between 150-300 rems. The direct cause of the overexposure was a decision by RTI management to operate the facility with the safety interlock system inoperative.*

SEPTEMBER 2, 1982 *A service technician at the irradiation plant at the Institute for Energy Technology, Norway, was exposed briefly to the 650,000 curie cobalt-60 source. The plant worker received an estimated dose of 1,000 rems, and died on September 15, 1982 from radiation injury.*

JUNE 11, 1986 *Radiation Technology Inc., cited in 1982 as a source of ground water pollution, was ordered by the State of New Jersey to pay a $600,000 directive to study the problem. Volatile organics such as trichloroethylene, methylene chloride, and trichloroethane were found in test wells drilled on RTI's 15 acre site in Rockaway, N.J. The toxic products were stored in 100 bulging, rusty, leaky 55 gallon drums on the company's property.*

JUNE 24, 1986 *A federal grand jury indicts Eugene T. O'Sullivan, San Jose, Calif., and Bruce J. Thomas of Somerville, N.J., both employees of International Nutronics Inc. [INI] of Palo Alto, Calif. INI and the two employees are charged with conspiracy, mail fraud, wire fraud, and concealing a radiation spill from the Nuclear Regulatory Commission [NRC]. In 1982, INI found a leaking cobalt-60 source in their source pool. A cleanup was begun which involved pumping the radioactive water through filters. During the filter operations, which were left running unattended overnight, a discharge line became detatched, spilling radioactive water onto the floor of the plant. INI employees were then instructed to dump the water down bathroom drains and into the public sewer system. INI then delayed an NRC inspection and attempted to hide radiation contamination from inspectors. (see detailed article in this issue)*

JUNE 24, 1986 *The Nuclear Regulatory Commission [NRC] revokes operating licenses for Radiation Technology Inc. [RTI] at their Rockaway, N.J. facilities. The license suspension comes after an NRC investigation into charges that RTI lied and deceived the NRC in regards to a March 3, 1986 shutdown. The March shutdown came after the NRC found RTI had bypassed safety equipment during plant operations, a repeated RTI failure, identical to the failure which lead to the worker overexposure in Sept. 1977. The NRC has turned this case over to the N.J. Justice Dept. for consideration.*

SCIENCE BOX

COBALT-60 *is a radioactive isotope of the metal cobalt, it is created by bombarding nonradioactive cobalt rods in a nuclear power reactor. Cobalt-60 gives off gamma rays and beta particles as it decays.*

REMS *are an arbitrary measure of radiation effects on living tissue. Like degrees or pounds, the number of rems increase as exposure to radiation increases. One chest X-ray, given to a 150 pound adult gives a dose of 5/100ths of one rem.*

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ZAPPING THE FOOD SUPPLY

By DONALD B. LOURIA

Irradiated food is not radioactive, but is it good for you? If irradiation becomes widespread, we may never know.

New arguments are boiling up over an old idea—irradiating food with ionizing radiation to kill microorganisms and prolong shelf life. The idea of exposing food to gamma radiation is over 30 years old, and in 1963 the Food and Drug Administration (FDA) began to permit the irradiation of wheat. Over the years, a few more foodstuffs such as spices and tea were added to the FDA's list of candidates for irradiation. But in 1984 the FDA started to approve irradiation of a much broader list of products which now includes meat, poultry, and fresh fruits and vegetables. Simultaneously the FDA has increased the levels of radiation that may be used. The FDA's recent willingness to allow most of the food supply to be irradiated—and at high doses—has triggered an acrimonious debate.

The amount of radiation involved is substantial. The FDA has approved a 3,000,000 rad dosage for treating spices, 300,000 rad for pork, and 100,000 rad for fresh fruits and vegetables. These intensities are millions of times greater than that of an ordinary chest X-ray (which is typically about 20 millirad). The announced goal of promoters of food irradiation is to obtain general approval for the use of up to one million rad.

Irradiation does not make food radioactive, nor has alleged radioactivity been at issue in the debate. But there is concern that foods processed by irradiation may contain radiolytic products that could have toxic effects.

The source of radiation is either cobalt 60 or cesium 137. The prospect of increased transportation and handling of cobalt and cesium—dangerous substances—has caused negative publicity. Some irradiation proponents say food processors could theoretically use as-yet-undeveloped linear acceleration techniques instead. But if food irradiation becomes commonplace any time soon, cesium or cobalt will be used.

The major objective of irradiation is to destroy microorganisms that cause food to spoil. For example, irradiating chicken should reduce the outbreaks of salmonella that are probably caused by careless or unhygienic methods in production and processing. Irradiating pork might reduce the already limited risk of trichinosis, and irradiating turkey would diminish the number of episodes of diarrhea that result from eating undercooked meat. William McGivney, an advocate of the technology, asserts that "irradiation offers a means to decontaminate, disinfect and retard the spoilage of the food supply."[1] Most opponents counter that adequate cooking and hygienic preparation will accomplish the same goal.

Promoters of irradiation emphasize that the shelf life of various foods will be increased. But these proponents have not produced any projections of the actual economic, or other, benefits of longer shelf life, especially in a developed country that has an abundant food supply. It may be easier to imagine that less developed countries might benefit if the shelf life of foodstuffs could be prolonged. But advocates have made no estimates of the extent to which better preservation would reduce world hunger, or of the cost of widespread food irradiation in less developed countries.

Irradiation is expected to reduce the need to use toxic chemicals as post-harvest fumigants, but some evidence indicates that irradiated foods are more, not less, subject to infection with certain fungi.[2]

At dispute in the controversy over food irradiation are the quality of the FDA's safety assessment, the loss of nutritional value that irradiated foods undergo, the risk of environmental contamination posed by irradiation facilities, and the possible cancer-causing nature of irradiated foods. An additional dispute revolves around the motives of the Energy Department, which has promoted irradiation and is the potential supplier of cesium 137, a waste byproduct of nuclear reactors.

■ **Safety.** The FDA judged safety based on five of 441 available toxicity studies. Of the available literature, claimed the FDA, only these five animal studies were "properly conducted, fully adequate by 1980 toxicological standards and able to stand alone in support of safety."[3]

But when these studies were reviewed at the Department of Preventive Medicine and Community Health of the New Jersey Medical School, two were found to be methodologically flawed, either by poor statistical analyses or because negative data were disregarded.[4] One of the two also suggested that irradiated food could have adverse effects on older animals. In a

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third FDA-cited study, animals fed a diet of irradiated food experienced weight loss and miscarriage, almost certainly due to irradiation-induced vitamin E dietary deficiency.[5] This study, which used foods that had been subjected to large doses of radiation, indicated that irradiated food suffered nutritional loss.

These three studies do not document the safety of food irradiation, and why the FDA relied on them is mystifying. The two other studies cited by FDA appear to be sound, but these studies investigated the effects of diets consisting of foods irradiated at doses below the current FDA-approved general level of 100,000 rad. Therefore they cannot be used to justify irradiation of foods at the levels currently approved by the FDA. Now, as the FDA considers adopting 300,000 rad as the general dosage level, the agency has not requested new studies, but is relying on some of the older studies it failed to include as methodologically sound.

Ethical and methodological barriers make it nearly impossible to study the effects of a diet of irradiated foods in human subjects. One small, controversial study carried out in India in the mid-1970s looked at the effects of feeding irradiated and unirradiated foods to 15 children with severe protein and total-calorie malnutrition.[6] Five children were fed unirradiated wheat, five freshly irradiated wheat, and five ate irradiated wheat that had been stored for a minimum of three months. Children who had eaten freshly irradiated wheat had unusually high rates of chromosomal abnormalities in their blood (especially polyploidy). No such changes occurred in the group that ate irradiated wheat that had been stored. Although some animal studies have supported the results of this study, it has provoked an acerbic debate. Clearly, the study has major flaws: the size of the sample is too small, subjects were not properly randomized, and statistical methods are unclear.

A more recent study of 70 subjects was conducted in China.[7] In contrast to the severely malnourished subjects in the Indian study, all the Chinese subjects were healthy young men and women. The experimental group ate irradiated foods that had been stored for an extended period of time. (Also, the group's diet was essentially wheat-free.) Both groups—those receiving irradiated foods and the control group—showed some increases in chromosomal abnormalities during the test period. Those given irradiated foods appeared to have a slightly increased rate of abnormalities. While neither of these studies are conclusive, they should not be dismissed. If the malnourished are particularly vulnerable to the dangers of an irradiated diet, hundreds of millions of malnourished people could be at risk. More studies on chromosomal abnormalities are necessary, but there are ethical as well as methodological problems in designing and conducting them.

The radura, international symbol for irradiated food.

■ **Nutrition.** There is impressive evidence that irradiated foods lose vitamin content, particularly vitamins A, C, E, and some of the B complex.[8] The amount of vitamin loss varies from one type of food to another, but in general there is a direct relationship between the amount of irradiation and the extent of nutritional value lost. Data on foods irradiated with 100,000 rad cannot be relied on to predict vitamin losses in foods irradiated with 300,000 or 1,000,000 rad. Some studies indicate that cooking irradiated foods causes an additional, inordinate loss of nutrients.[9] In addition, little is known about the nutritional effects of freezing and thawing food that has been irradiated.

Those who favor irradiation do not deny the loss of vitamin content, but often assert that these nutritional losses will not harm people who eat a generally nutritious and balanced diet. Others suggest that irradiated foods should be fortified with vitamins, or that the public should be urged to take vitamin supplements. In less developed countries, reducing the food supply's nutritional value would seem to raise a major ethical question. Asking the world's 800 million malnourished and 2 billion undernourished to make a possible trade-off between longer shelf life and less nutrition seems harsh, particularly before more complete information on the nutritional value of irradiated foods is available.

■ **Environmental issues.** Opponents of food irradiation have raised four interrelated environmental issues: the dangers of transporting radioactive isotopes to hundreds of treatment facilities, the environmental practices of those facilities, the danger of worker exposure in environments where irradiation chambers are frequently opened to allow foodstuffs to pass in and out rapidly, and potential security problems at irradiation plants.

If all the poultry in the United States were to be irradiated, hundreds of new irradiation plants would be needed. There are about forty plants of a size suitable for food irradiation already in operation. Most of these plants are used primarily to irradiate disposable medical equipment. In New Jersey, which has the highest concentration of these facilities, plant safety records are not encouraging. Virtually every New Jersey plant has a record of environmental contamination, worker overexposure, and regulatory failings.

A serious accident occurred at a Decatur, Georgia, cesium irradiator in June 1988. That facility was shut down after a cesium leak exposed 10 workers to radiation and contaminated medical supplies and consumer products.[10] Clean-up costs at the Decatur plant have climbed to more than $15 million, and no conclusions have been reached about the cause of the accident.

Unlike major nuclear facilities, irradiation plants will be relatively small and are unlikely to be well protected. Opponents fear these plants will be particularly vulnerable to sabotage or terrorist attack and express similar concerns about the safety and security of large numbers of shipments of highly radioactive materials. If food irradiation becomes commonplace, hundreds of irradiation plants will need to have their inventories of cesium 137 or cobalt 60 replenished on a regular basis.

■ **The cancer threat.** The irradiation process produces unique radiolytic

products whose chemical and toxic properties have not been characterized. In-vitro tests in the laboratory suggest that some of these products may cause mutations, and these tests have led critics of irradiation to contend that some irradiated foods may prove carcinogenic. But there are no substantial data from epidemiological studies on either animals or humans to support that contention. Unless the chemical properties of all the radiolytic products are identified, and animals studies using amplified doses are conducted, there is no way to prove that a cancer risk exists and, if so, whether it would fall within acceptable limits. Adequate evidence for prudent decisions on the cancer risk of food irradiation will not be available for some time.

■ **The Energy Department connection.** The Energy Department, through its Byproducts Utilization Program, tries to develop commercial uses for radioactive waste products. Creating a commercial demand for cesium, which is a waste product of both weapons production and civilian nuclear power, has been one of its expressed goals since the early 1980s. Energy Department memoranda indicate that the department's plan included pricing cesium so low that it would drive Canadian cobalt out of the market.[11]

Some critics charge that the Energy Department has been even more devious. They claim that the department was less interested in disposing of cesium than it was in overturning the ban on reprocessing civilian nuclear fuel. These critics claim that the department calculated that widespread food irradiation would eventually deplete the available supplies of cesium 137. At that point, the irradiation industry would begin to lobby for the reprocessing of spent fuel, and the department could use the industry to overcome the political and economic obstacles to reprocessing nuclear fuel. Once reprocessing was permitted, the Energy Department could separate the plutonium in spent fuel, which it could then use in weapons.[12]

There is no reason to adopt every new technology that is suggested. Ideally, food irradiation should be made to compete on a commercial basis with other technologies. If it had no disadvantages or dangers, the marketplace alone would decide its fate. Most food processors now think that irradiation is costly and less effective than other methods of preservation, and consumers are resistant to the idea of radiation-treated foods. But the adoption of food irradiation technologies raises questions of public health. Many local authorities have opted for alternative technologies. In Florida, the Citrus Commission/Department of Agriculture has chosen to use two other processes—fly-free zones and cold treatment. Hawaiian officials rejected federal funds offered to build an irradiation facility for processing papaya; instead, the papaya processor will use nonchemical treatments such as dry and steam heat or double hot water dips. Some biotechnological researchers are confident that recombinant DNA technologies will eventually create pest-resistant fruits and vegetables with extraordinarily long shelf lives.

If food irradiation is adopted prematurely, research on its health effects will be hampered. Widespread use of the technology will make it impossible to detect any but the most obvious of adverse effects, because it will be impossible to define a control population for purposes of study. This problem will be further complicated if irradiation levels are increased to 1 million rad.

Labeling is currently required to notify the consumer when whole foods have been irradiated. The label includes written notice and the international irradiation symbol, the "radura"—a stylized flower which has caused some confusion because of its close resemblance to the Environmental Protection Agency's logo. Prepared or packaged foods, foods prepared for restaurant or school cafeteria use, and foods which merely contain some irradiated ingredients are exempt from labeling.

While the FDA has approved wholesale food irradiation, other regulators are less eager. More than a dozen state legislatures, concerned about the environmental and health risks of irradiated food, have restricted its sale and distribution. Maine has banned both irradiation facilities and all irradiated food except spices. New York and New Jersey recently enacted two-year moratoriums on the sale or distribution of irradiated foods, and New Jersey has prohibited the "manufacture" of such food items. Other states contemplating restrictive legislation include Massachusetts, Pennsylvania, Minnesota, Oregon, and Alaska. Bills have been introduced in Congress to place a two-year moratorium on irradiated foods while the National Academy of Sciences reviews the health, environment, and worker safety issues. Great Britain has banned irradiated food, although legislation has been introduced into Parliament to overturn the ban. West Germany, Australia, Denmark, Sweden, and New Zealand have all banned or severely limited the implementation of food irradiation. ■

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11. K. Terry, "Why is DoE for Food Irradiation?" *The Nation* (Feb. 7, 1987), pp. 142–56.

12. Piccioni, "Food Irradiation"; Terry, "Why is DoE for Food Irradiation?"

Commercial irradiation of strawberries. The bugs may not be killed and carcinogenic substances are created as an additional menace.

The Ecologist
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(1988)

Food Irradiation: Contaminating our Food

by Richard Piccioni

Food irradiation has long been promoted by the nuclear industry as an effective and safe means of preserving food at minimum risk to the public. In fact, irradiation not only depletes the nutritional value of food but it also masks the bacterial contamination of rotting food. Moreover, irradiation exposes the consumer to a whole new range of carcinogens. Indeed, food irradiation should be seen for what it is: an unwarranted attempt to find a commercial use for nuclear wastes.

In the last three years, the approval and implementation of food irradiation has created a growing concern amongst both the scientific community and the general public. In the United States, the debate centres around a series of approvals recently passed by the Food and Drug Administration (FDA) for irradiation of all grains, fruits, vegetables, pork, and spices at doses ranging from 10,000 to 3 million rads. Approval is now pending for the irradiation of poultry at 300,000 rads to protect against bacterial contamination. A second federal agency, the Department of Energy (DOE), recently received funding to promote food irradiation technology and to continue research and development in this area. At the same time, the Delaney Amendment, which prohibits the addition of carcinogenic substances to processed foods, has recently been upheld. This amendment represents a serious legal challenge to the FDA's decisions on food irradiation.

A wide-scale food irradiation programme in the US and abroad would have an adverse impact on public health in a number of ways:

- Through the consumption of carcinogenic substances generated in irradiated foods:
- Through the use of irradiation to mask bacteriological contamination of spoiled food:
- Through the replacement of fresh foods with nutritionally depleted irradiated foods:
- Through accidents involving leaks or the mishandling of the multi-megacurie radiation sources used in food irradiation plants:
- And, finally, through the environmental damage attending the operation of nuclear reactors and the reprocessing of spent nuclear fuel to provide the required radioactive isotopes for the food irradiation industry.

The food irradiation market is potentially enormous; irradiation of a substantial fraction of the grain and poultry consumed in the US would require the operation of hundreds of irradiation facilities.[1] Large potential markets exist in the treatment of foods and spices imported from foreign countries with lower standards of food hygiene.[2] Currently, the DOE is planning the construction of five demonstration plants, fuelled with radioactive caesium-137 generated during the production of nuclear weapons. If the plants go ahead, food irradiation would thus become a major (and dangerous) route by which military nuclear wastes are dispersed throughout the environment. A number of private companies which now irradiate medical equipment and other non-food items, using caesium-137 or cobalt-60, are actively seeking to expand their product line to include foods such as grains, poultry, citrus fruits, and berries.

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Carcinogenic and Mutagenic Risks

During radiation treatment, foods are exposed to a source of gamma-emitting cobalt-60 or caesium-137. As the radiation penetrates the food, part of the energy contained in each gamma photon is dissipatedd by the ionizing of water, protein, carbohydrate, fat, nucleic acids, vitamins, minerals, and other food components. The ionizing of these substances causes them to undergo drastic and complex chemical changes, resulting in a residue of chemically transformed material. This residue is referred to as a 'radiolytic product'. The complexity of food chemistry and the limitations of chemical analysis make it impossible to identify all radiolytic products. This, together with experimental results, causes concern that the diverse mixture of chemicals generated in irradiated food contains substances that are capable of causing cancer or genetic damage.

Examination of the scientific literature reveals a large number of research reports which attest to the presence of carcinogenic or mutagenic activity in irradiated foods and food components. Table I gives details of the diverse effects which have been observed and reported. One series of papers documents the mutagenicity of irradiated solutions of ribose, deoxyribose, and thymidine, all widespread constituents of food.[3,4,5] In work by several investigators (*see* Table I), an increased frequency of lethal sex-linked recessive mutations was observed in *Drosophila melanogaster* cultured on an irradiated medium.[6,7,8] Multiple effects have been reported in mice, rats, and hamsters fed an irradiated diet, including lethal mutations in developing germ cells, reduced sperm counts, and aneuploidy and chromosome damage in bone marrow cells (*see* Table I). Irradiated sucrose solutions have produced chromosome breaks in cultured human lymphocytes.[9] A series of experiments, using mice, rats and monkeys confirms a finding first made in a study of malnourished children[10] that a diet containing freshly irradiated wheat increased the incidence of polyploidy in peripheral blood lymphocytes.[11,12,13,14]

The majority of these studies were carried out without any attempt to determine mutagenic activity; often irradiated material was only a small component of an otherwise non-irradiated medium or diet. Thus the observation of genotoxicity is all the more alarming.

A number of workers have been able to analyse irradiated foods and food components chemically and to identify known carcinogenic and mutagenic compounds (*see* Table II). In particular, the radiolytic generation of such known mutagens as formaldehyde, formic acid, glyoxal, malondialdehyde, lipid peroxides, and quinones, is well-documented in the scientific literature (*see* references in Table II). Experiments performed by the US Army attest to the presence of benzene, a known carcinogen, in cooked, irradiated beef at levels over seven times higher than those found in cooked, non-irradiated controls.[15] One study relevant to the proposed irradiation of fish showed a synergistic effect in which lipid peroxide intermediates, formed on irradiation of unsaturated fatty acid preparations, increased the rate of oxidation of benzo(a)pyrene (an environmental carcinogen precursor widely distributed in many foods) to its active carcinogenic form.[16]

Inadequate Testing

Nonetheless, proponents of food irradiation continue to argue that safety studies show no evidence of adverse effects, other than vitamin depletion at very high doses.[17] The FDA has arbitrarily labelled as 'remote' the possibility that any radiolytic products are carcinogenic, and has granted permission to irradiate broad categories of foods, thereby eliminating the requirement for carcinogenicity testing of any specific food items.[18] The FDA has also declared an arbitrary dose of 100,000 rads to be safe for fruits and vegetables. The proposed dose for poultry is three times higher, yet the FDA has not sought evidence from would-be irradiators to determine whether or not the irradiated carcasses are carcinogenic.[19]

This position is out of line both with the FDA's legal obligation to protect the health and safety of the American people, and with the agency's usual approach to the regulation of carcinogenic substances in foods, drugs and cosmetics. Companies approaching the FDA for permission to market food additives, for example, are required to provide estimates, derived from animal studies, of the maximum carcinogenic potential of their product. The studies involve animals being observed over significant periods and tested with exaggeration factors of 1,000 or more. This approach has

Table I. BIOASSAYS ON IRRADIATED ORGANIC MEDIA AND FOODS SHOWING POSITIVE MUTAGENICITY, CHROMOSOMAL DAMAGE, TERATOGENICITY, OR CYTOTOXICITY

author(s)	date	irradiated material	observation	observed in
Kuzin & Kryukova	1961	plant leaves	Chromosomal damage	plant embryos
Swaminathan et al	1962	potato mash	Chromosomal damage	barley embryos
Kuzin	1963	plant leaves	mutagenicity of extracts	plant cells
Swaminathan et al	1963	culture medium	mutagenicity	Drosophila
Chopra & Swaminathan	1963	potato mash	devel. abnormalities	barley embryos
Molin & Ehrenberg	1964	culture medium	cytotoxicity	bacteria
Berry et al	1965	glucose, fructose	cytotoxicity	human & mouse cells
Chopra	1965	culture medium	probable mutagenicity	bacteria
Holsten et al	1965	coconut milk, sucrose	chromosomal damage	carrot explants
Parkash	1965	nucleic acids	mutagenicity	Drosophila
Rinehart & Rally	1965	culture medium	mutagenicity	Drosophila
Frey & Pollard	1966	culture medium	mutagenicity	bacteria
Shaw & Hayes	1966	sucrose	chromosomal damage	human lymphocytes
Hills & Berry	1967	glucose	cytotoxicity	mouse fibroblasts
Hollowell & Littlefield	1967	plasma	chromosomal damage	human lymphocytes
Mäkinen et al	1967	pineapple	chromosomal damage	onion roots
Parkash	1967	nucleic acids	mutagenicity	Drosophila
Rinehart & Rally	1967	culture medium	mutagenicity	Drosophila
Schubert et al	1967	sucrose	cytotoxicity	bacteria
Steward et al	1967	sucrose	cytotoxicity	carrot explants
Hollowell & Littlefield	1968	plasma	chromosomal damage	human leucocytes
Metalli et al	1968	wheat endosperm	mutagenicity	wheat
Ammirato & Steward	1969	sucrose	devel. abnormalities	plant root cells
Chopra	1969	culture medium	mutagenicity	bacteria
Moutschen-Dahmen et al	1970	laboratory diet	preimplantation death	mouse
Schubert and Sanders	1971	various sugars	cytotoxicity	bacteria
Kopytov et al	1972	potatoes	mutagenicity of extracts	mouse (sperm cells)
Bhaskaram & Sadasivan	1975	wheat	polyploidy	malnourished children
Vijayalaxmi & Sadasivan	1975	wheat	chromosomal damage	rat (bone marrow)
Vijayalaxmi	1975	wheat	polyploidy	rat (bone marrow)
Vijayalaxmi	1976	wheat	mutagenicity	mouse
Vijayalaxmi	1976	wheat	sperm count reduction	mouse
Vijayalaxmi	1976	wheat	polyploidy	mouse (bone marrow)
Vijayalaxmi	1976	wheat	aneuploidy	mouse (sperm cells)
Vijayalaxmi & Rao	1976	wheat	mutagenicity	rat
Vijayalaxmi & Rao	1976	wheat	sperm count reduction	rat
Aiyar & Subba Rao	1977	various sugars	mutagenicity	bacteria
RAO/IAEA/WHO	1977	potatoes	mutagenicity of extracts	mouse
Renner	1977	laboratory diet	polyploidy	hamster
Levina & Ivanov	1978	laboratory diet	autoimmune disease	rat
Vijayalaxmi	1978a	wheat	low antibody levels	rat
Vijayalaxmi	1978b	wheat	polyploidy, other effects	monkey
Wimmer et al	1980	nucleic acids	mutagenicity	bacteria
Ivanov & Levina	1981	laboratory diet	testicular abnormalities	rat
Wimmer et al	1981	nucleosides	mutagenicity	bacteria
Wimmer & Natarajan	1981	deoxyribose	chromosomal aberrations	hamster cells

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formed the basis on which thousands of compounds have been approved or banned.[20]

In the case of food irradiation, a special problem exists. Because radiolytic products do not represent a defined group of chemical compounds, they cannot be tested individually at high concentrations. The alternative, feeding animals thousands of times as much food as they would otherwise eat, or irradiating the food at doses thousands of times higher than is proposed, is not possible. There is no simple way to achieve the dose exaggeration factor required to protect the health of large populations consuming irradiated foods. As long ago as 1967, the FDA itself acknowledged the special difficulties of ascertaining the safety of irradiated food,[21] and, in 1968, the agency rescinded its earlier approval of food irradiation after serious questions arose regarding the conduct and interpretation of the experiments on which the FDA had relied. Originally, the FDA claimed that early experiments showed irradiated food not to be carcinogenic. In fact, these experiments showed a significant increase in tumours in animals fed irradiated food.[22]

In 1979, after over a decade of controversy, the FDA set up the Bureau of Food's Irradiated Food Committee (BFIFC) to develop criteria for establishing the safety of irradiated foods.[23] This group developed a theoretical model to predict levels of what they called 'unique radiolytic products' (URPs). It was the assertion of the BFIFC that only URPs – that is, substances found to be unique to irradiated foods – were of regulatory concern. To take an actual example, irradiation of beef generates the carcinogen benzene as a radiolytic product; however, because charcoal broiling also generates benzene, benzene will not qualify as a URP and is excluded from further consideration as a hazard accompanying radiation processing.

Arbitrary Limits

Lacking meaningful toxicological data, the BFIFC made a theoretical estimate of the possible risks of eating irradiated foods. At a dose of 100,000 rads, BFIFC predicted that some 30 parts per million (ppm) of total radiolytic product would be formed, and that 10 per cent of this could be unique to radiation processing; in other words, food treated with 100,000 rads would contain at mo 3 ppm of URPs. The committee then made an extraordinary leap of faith: without any experimental evidence, they used their hypothetical arguments to lay down regulations defining actual use. Moreover, they stated that the 3 ppm of chemically and toxicologically undefined substances, formed in food as a result of radiation processing, would be "similar to natural food components" and safe to include as a substantial part of the diet of some 240 million Americans. Given the possible consumption of many kilograms of irradiated food per person per year by virtually the entire US population, the acceptance of the 3 ppm level is an extreme departure from known precedents for regulating numerous food substances hazardous at far lower concentrations.[24]

Currently, the FDA has adopted the BFIFC's recommendation to permit the irradiation of a wide range of food at up to 100,000 rads, without the necessity of actual toxicological testing. The BFIFC has also recommended that spices, because of their smaller contribution to the total diet, be exempted from testing at up to 3 million rads.[23] The FDA undertook a literature survey before adopting the BFIFC's theoretical approach. Of over 400 studies reviewed, only 69 satisfied the criteria for technical acceptability. Of the 69 acceptable studies, 32 reported adverse effects from feeding irradiated foods, while 37 "appeared to support safety".[25] When further selection criteria were applied, only five studies remained (roughly one per cent of published reports). These five studies reported the absence of statistically significant increases in tumours in numbers of animals fed whole irradiated foods. In none of the studies was there a significant dose exaggeration factor, leading the FDA to report:

> "... the extreme dilution of the potentially toxic unique radiolytic products in proportion to the high levels of the irradiated foods themselves, would result in an inability, as in traditional toxicology testing, to exaggerate the dose of the

Table II. IDENTIFICATION OF MUTAGENIC, CARCINOGENIC, OR CYTOTOXIC RADIOLYTIC PRODUCTS IN IRRADIATED ORGANIC MEDIA OR FOOD

author(s)	date	irradiated material	radiolytic product	comments
Phillips et al	1958	dextrose, fructose	glyoxal formaldehyde	mutagenic mutagenic
Kuzin	1963	plant tissues	organic peroxides orthoquinones	mutagenic carcinogenic
Frey & Pollard	1966	minimal cell medium	hydrogen peroxide	mutagenic, generates secondary mutagens
Kuzin	1966	plants, rat thymus, tyrosine	orthoquinones orthophenols	carcinogenic carcinogenic
Schubert et al	1967	sucrose	hydroxyalkyl peroxides glyoxal	mutagenic mutagenic
Steward et al	1967	sucrose	formic acid	mutagenic
Brooks & Klamerth	1968	glucose	glyoxal malonyldialdehyde	mutagenic, binds to DNA mutagenic, binds to DNA
Chopra	1969	glucose	organic peroxides	mutagenic
Schubert & Sanders	1971	D-glucose, D-fructose, D-mannose, D-rhamnose, D-galactose, D-fucose	alpha, beta unsaturated carbonyl sugars	cytotoxic (toxicity increased upon heating irradiated solution)
El Zeany	1980	buffalo meat	peroxides carbonyl compounds	mutagenic cytotoxic
Wilmer et al	1981	deoxy-D-ribose, D-ribose	hydrogen peroxide malonaldehyde carbonyl compounds	mutagenic mutagenic cytotoxic
Gower & Wills	1986	benzo(a)pyrene, starch & oil mixtures	benzo(a)pyrene (oxidized) quinones malonaldehyde lipid peroxides	carcinogenic carcinogenic mutagenic mutagenic

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test compound. For these reasons it would be difficult to devise a traditional toxicology study of sufficient sensitivity to provide assurances of safety for the population exposed to unique radiolytic products from irradiated foods constituting a major portion of the total diet."[25]

In spite of this, the FDA concluded that "studies with irradiated foods do not appear to show adverse toxicological effects", and it reverted to the same theoretical '3 ppm' argument which it had been supposed to replace with toxicological data.[26]

There is an alternative approach to the carcinogenicity testing of irradiated foods; namely, to prepare concentrated extracts of foods after radiation exposure, and to compare the biological activity of such concentrates with similar preparations for non-irradiated controls. In a letter to *Science*, published in 1984, Drs. Samuel Epstein and John Gofman called for caution over the approval of food irradiation, and specifically suggested the testing of concentrated extracts of irradiated foods, using methodologies that have been applied elsewhere in the analysis of naturally occurring carcinogens and mutagens.[27] A small amount of work of this kind has been done, indicating the occurrence of dominant lethal mutations in the spermatozoids, spermatids, and spermatocytes of mice fed an alcohol extract of gamma-irradiated potatoes, as compared to extracts of non-irradiated controls.[28] The effect was not reproduced, however, by a Japanese group.[29] A report on food irradiation by a joint committee of the Food and Agricultural Organization (FAO), the International Atomic Energy Agency (IAEA), and the World Health Organization (WHO), notes, without citing references, that mutagenic activity has been detected in alcohol extracts of irradiated wheat.[30] Significantly, the effect, which was described as "worthy of further study" is not mentioned in the joint committee's 1981 report.[31]

Nuclear Waste and Irradiated Foods

Worldwide, there are currently some 132 large irradiation facilities in operation of a size appropriate for food irradiation; 50 of these are in the US. With minor exceptions, these facilities process exclusively non-food items, primarily disposable medical equipment.[32] If dedicated to food irradiation, each of these large irradiation plants could process approximately 150,000 metric tons of food a year at a dose of 100,000 rads.[1] Since the average North American consumes roughly 800 kg of food annually (directly or in the form of feed fed to animals), irradiation of the US food supply at 100,000 rads would require the operation of over 1,200 irradiation plants.[33] Higher doses would require more plants. For example, consumption of poultry (primarily chicken) is expected to rise to 8.6 million metric tons per year in 1987.[34] A total of 170 plants would be required to irradiate this commodity alone at the dose level laid down by the USDA (300,000 rads). Thus, in order to implement the irradiation of food on a wide scale, the number of large irradiation facilities in operation will have to increase dramatically.

Large irradiation facilities (of the type assumed in the preceding calculations) contain one million curies of gamma-emitting cobalt-60 or 4-6 million curies of caesium-137.To compensate for radioactive decay, either type of plant will have to be resupplied with approximately 120,000 curies each year.Given the number of facilities required, the quantity of installed radioactive material which would be needed for extensive food irradiation in the US alone would be in the range of one to several billion curies.[35] Thus, by pressuring the FDA to approve food irradiation, the US government has created a market for enormous quantities of radioactive material.

Significantly, the only isotope which is available in sufficient quantities for widespread food irradiation is caesium-137, a waste product of nuclear weapons production and of the civil nuclear power programme. The US Department of Energy and its predecessors have long promoted the use of caesium-137 'byproduct material' in the treatment of foods.[36] A statement from congressional testimony submitted by the DOE in 1983 provides an illuminating glimpse into the nature of the DOE's interest in food irradiation:

> "The strategy being pursued by DOE's Byproducts Utilization Program is designed to transfer federally developed caesium-137 irradiation technology to the commercial sector as rapidly and successfully as possible.The measure of success will be the degree to which this technology is implemented industrially and the subsequent demand created for Cs-137".[37]

With the DOE as supplier, food irradiation has the purpose of ridding the military of vast amounts of its nuclear wastes. The DOE has made immediately available 77 megacuries of caesium-137, obtained from military plutonium production reactors at the Hanford facility in Richland, Washington. This source of the isotope will be immediately used for the irradiation of agricultural commodities in the five prototype demonstration facilities to be constructed in the next few years. This material is only a small portion of the inventory of caesium-137 at the DOE's Hanford and Savannah River weapons plants.[38]

The quantity of caesium-137 which has been and will be produced in commercial nuclear power reactors dwarfs even the

amount produced in military installations. The cumulative total of caesium-137 produced in commercial US reactors amounted to some 1,100 megacuries by the end of 1985, with an annual production rate of approximately 200 megacuries per year.[39,40] This would be sufficient to fuel 540 food irradiation plants with 5 megacuries of caesium-137 in each. Congressional testimony presented by DOE officials in 1984 indicated that the DOE is interested in using caesium-137 obtained from reprocessed spent fuel from civilian reactors for food irradiation.[41] A widely circulated brochure, produced by CH2M-Hill, a major DOE contractor, presents commercial reprocessing of spent fuel as virtually the only means of supplying sufficient radioactive material to implement food irradiation on a large scale.[42]

In order to obtain caesium-137 from spent commercial reactor fuel, the fuel must first be reprocessed. Although the DOE's Barnwell facility in South Carolina is complete, no facilities are yet in operation in the US for reprocessing spent commercial fuel. Reprocessing is being carried out in England at the Sellafield facility and in France at Cap La Hague. Work has been underway for several years to modify the existing chemicals separations facility[43] at Hanford to accommodate high burn-up, zirconium-clad fuels, which would include those obtained from commercial reactors. The programme is currently on hold because of a shortage of funds. However, the DOE is apparently considering using the existing submarine fuel reprocessing facilities at Idaho National Engineering Laboratory (INEL).[44]

The DOE does not advertise its interest in commercial spent fuel reprocessing, probably because of the 1982 Mitchell-Hart-Simpson Amendment to the 1954 Atomic Energy Act, which specifically prohibits plutonium obtained from the reprocessing of spent fuel from civil reactors being used in nuclear weapons. This amendment, which was actively opposed by the DOE at the time of its enactment[45] contains a loophole in an exclusion clause permitting weapons use of civil plutonium "in case of national emergency". Thus the future of plutonium from commercial spent fuel has been kept open. The DOE continues the construction of its laser isotope separation facility at INEL which would enable DOE to make weapons grade plutonium from commercial reactor waste.

Pesticide replacement

In the absence of quantitative studies to estimate the carcinogenic risk posed by consuming irradiated foods, there is no basis to the claim that food irradiation could replace the use of carcinogenic pesticides as a means of food preservation. In 1987, the National Academy of Sciences identified 23 pesticides which together were held responsible for the vast majority of the total carcinogenic risk from pesticide residues in the US food supply.[20] Food irradiation would not eliminate these pesticides since most are herbicides, insecticides, or fungicides applied in the field to prevent pre-harvest losses.[46] In fact, since irradiated products are more susceptible to infection by moulds and fungi,[47,48] irradiation may well increase the need for post-harvest fungicides on fruits and vegetables.

Pathogens in Poultry

The highly automated and poorly regulated nature of many of the poultry production plants in the US has led to the increased danger of widespread contamination of supermarket chicken with Salmonella and other pathogenic bacteria. As part of a recent study of the poultry industry in the US, the National Academy of Sciences (NAS) estimated the health effects of the bacterial contamination of chicken carcasses during slaughter. The NAS committee called for the upgrading of hygienic standards in slaughterhouses, and recommended the setting up of a comprehensive quality assurance programme with improved methods of monitoring compliance by poultry producers.[49] These recommendations are in line with those of other critics of the poultry industry, who see the current problem of bacterial contamination as the result both of regulatory lassitude on the part of the US Department of Agriculture and of the drive to increase production on the part of the poultry producers. Reform of the industry is the subject of pending federal legislation.

Hazards of Food Irradiation Facilities

A large food irradiation plant contains roughly 100 times as much radioactivity as a typical cobalt-60 source used in hospital cancer therapy. The inventory of caesium-137 present in a large irradiator is comparable to that in a 1000 megawatt nuclear power reactor.[50] Furthermore, irradiators are inevitably open structures since food must be able to pass freely in and out of the irradiation chamber.

Workers therefore run a high risk of exposure to lethal or near-lethal doses of gamma radiation.[50,51,52] Equally, the opportunities for sabotage are numerous. The contamination of shielding pools from leaking source elements has been documented in existing irradiation plants, as has the leakage and spillage of shielding water into the surrounding environment. The mishandling of discarded gamma sources has led to two serious contamination incidents in recent years.[53,54] Indeed, as a result of mismanagement at an irradiation plant, the Nuclear Regulatory Commission (NRC) revoked the licence of a major company in the US irradiation industry.[55]

In the light of these facts, it is extraordinary that the US Environmental Protection Agency (EPA) does not require an environmental impact statement prior to the siting of irradiation facilities, and that the NRC does not require special security measures. Clearly, the pressure to 'solve' the nuclear waste problem is guiding agency decisions, as non-regulation will greatly facilitate the licensing of hundreds of new irradiation facilities. Such facilities, however, cannot be in the best interest of those who work in or live near them, nor of the general public who will have no choice but to eat food which has effectively been legally contaminated.

Conclusion

The viability of food irradiation as a processing technology is based upon three false assumptions: first, that ionizing radiation can be used safely and effectively to destroy living organisms in food without producing dangerous changes in food chemistry; second, that hazardous by-products of nuclear weapons manufacture can be used safely and effectively in the civilian sector; and third, that dispersing radioactive materials into the environment results in an acceptable level of radiation exposure for any single individual.

In fact, the chemical changes in food produced by ionizing radiation are already known to be hazardous, and the FDA's claimed ignorance of that well-documented hazard is unques-

tionably in violation of the law: recently, the Justice Department upheld a decision against the FDA by the District Court of Appeals in Washington, DC, charging that FDA had violated the Food, Drug and Cosmetic Act when it approved the use of two dyes shown by animal testing to be weak carcinogens.[56] The effect of this decision is to strengthen further the Delaney Amendment, which forbids the addition of any known human or animal carcinogen to food, drugs, or cosmetics. Since food irradiation is defined as a food additive,[18] the evidence set out in Table II shows it would be a violation of the Delaney Amendment to permit the treatment of food with irradiation.[57]

The view that the FDA's actions in the field of food irradiation have been unlawful and dangerous to public health has also been expressed at the state level; legislation banning the sale of irradiated foods has been enacted in the state of Maine, and is pending in New York, New Jersey, Alaska, Vermont, New Hampshire, and Pennsylvania. Citizen initiatives to ban irradiated food are underway in Florida and Oregon. Efforts to disperse into society at large the wastes from the manufacture of nuclear weapons is hardly a proper basis for food and public health policy. It represents a real threat to our existence, comparable to, if more protracted than, the direct use of those weapons on civilian populations. It cannot be allowed to continue.

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CORRECTION

THIS DOCUMENT
HAS BEEN REPHOTOGRAPHED
TO ASSURE LEGIBILITY

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55. *Federal Register*, 1986b, June 30: 51:23612-23613. *Radiation Technology, Inc: Order Suspending Licenses (Effective Immediately)*.
56. US Court of Appeals for the District of Columbia Court, Public Citizen et al. vs Dr. Frank Young, Commissioner, FDA (No. 86-1548) and Public Citizen vs Department of Health and Human Services (No. 86-5150), October 23, 1987.
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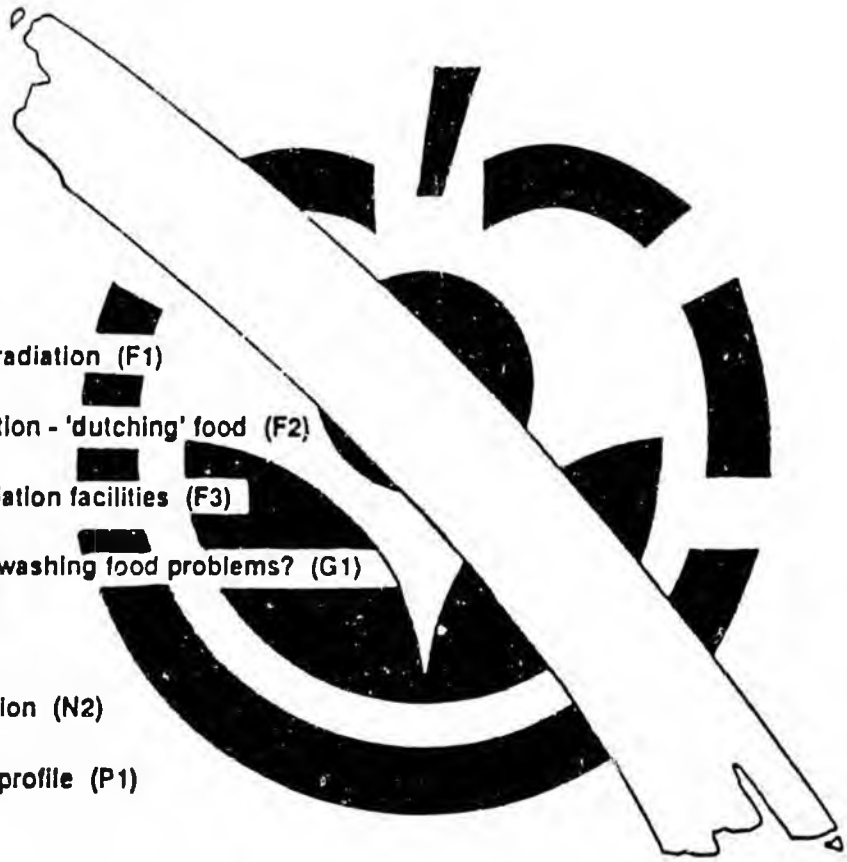
FIN LINK

FOOD IRRADIATION NETWORK

FIN - the Food Irradiation Network - is an informal worldwide coalition of like-minded groups and individuals opposed to food irradiation unless and until all outstanding issues are fully resolved.

No: 1

November 1989



CONTENTS:

- This issue of FIN LINK was produced by the Education and Research Association (ERA) for Consumers, Malaysia, with assistance from the International Organization of Consumers Unions (IOCU) Regional Office for Asia and the Pacific, Malaysia. Volunteers and sponsors for the production of future issues of FIN LINK are welcome - interested partners may get in touch with any of the five FIN Regional Contact Points (see overleaf for addresses).

FIN links the activities of like-minded groups and individuals worldwide through five Regional Contact Points, which exchange information among themselves and disseminate news to FIN partners in their respective regions. Information sent to the five Regional Contact Points (see overleaf for addresses) will reach all other FIN partners via the information service called FIN LINK and other means of information exchange.

FIN AIMS

- call for a global moratorium on food irradiation unless and until all issues relating to its need, appropriateness, safety, detectability, labelling, wholesomeness, control and overall costs to society and the environment have been fully evaluated and subjected to public scrutiny
- call on the World Health Organization to reopen and thoroughly investigate all aspects of safety associated with irradiated food
- call upon the World Bank and other financial institutions/aid agencies not to include food irradiation in their programmes and projects
- support the development of appropriate technologies which improve the quality, quantity and safety of the world's food supply
- call for public participation in all decision making processes related to food irradiation.

FIN REGIONAL CONTACT POINTS:

- AFRICA
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  Mexico
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- NORTH AMERICA
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  225 Lafayette St
  Rm 612
  New York NY 10012
  USA
  Phone: 1212-9419340
  Fax: 1212-9415678.

A HISTORY OF FOOD IRRADIATION

(Compiled by Tony Webb and Leah Bloomfield)

1916 *Sweden experiments with irradiation of strawberries

1921 *US takes out irradiation patents

1930 *France takes out patents

1953 *Food irradiation announced as one of the 'atoms for peace' technologies
*US Army begins research into irradiation

1957 *West Germany irradiates spices

1958 *West Germany bans food irradiation
*USSR permits irradiation of potatoes
*US classifies irradiation as a food additive; safety testing required.

1960 *Canada permits irradiation of potatoes

1963 *US permits irradiation of wheat, potatoes and bacon

1964 *IAEA, FAO and WHO set up Joint Expert Committee on Food Irradiation (JECFI) to review research data
*UK Dept of Health Report raises critical questions on the safety of irradiated food

1967 *UK prohibits irradiation and sale of imported irradiated food

1968 *US FDA withdraws permit for bacon when review finds adverse effects and poorly conducted experiments.
*Accident at Hawaii irradiator. Contamination still detectable in 1980

1969 *First JECFI meeting, followed by report in 1970, on safety and wholesomeness of irradiated foods. Provisional clearance given for potatoes, wheat, wheat products at specified doses

1971 *International Food Irradiation Project (IFIP) established with headquarters at Karlsruhe, West Germany

1972 *Japan grants permit to irradiate potatoes

1974 *Accidents at US irradiation facilities (Isomedix) (International Nutronics - uncovered in 1982)

1975 *Radiation leaks and worker exposure in accidents at irradiator facilities in US (Radiation Technology) and Italy (Stimos)

1976 *Second JECFI meeting, followed by report in 1977, relaxes toxicology testing requirements for irradiated foods clearances given (unconditionally) to potatoes, wheat, strawberries, papaya, chicken and (provisionally) to onions, rice, cod, redfish
*Australia grants first of two special permits to irradiate prawns to cover up bacterial contamination (second in 1979)

1977 *Worker exposed in accident at US irradiator facility (Radiation Technology)

1978 *Japanese baby food scandal - illegally irradiated vegetables used in baby foods since 1974. Studies show harmful effects in onions - onion irradiation not permitted

1980 *Third JECFI meeting, followed by report in 1981. Unconditional clearance given for all foods up to average dose 10 kGy

1981 *Fire at US irradiator (Becton Dickinson)

1982 *UK government Advisory Committee (ACINF) established
*Worker dies from irradiation accident in Norway
*IFIP research project terminated

1983 *UN Codex Alimentarius Commission approves International General Standards for Irradiated Foods and Recommended International Code of Practice for the Operation of Radiation Facilities for the Treatment of Foods
*Officials of IBT Ltd convicted of doing fraudulent research for government and industry - six years of food irradiation study data from 1970s, costing $4 million, is worthless.
*Pollution Probe (Canada) publishes first critical report on food irradiation
*IAEA/FAO/WHO set up International Consultative Group on Food Irradiation (ICGFI) to promote food irradiation

1984 *US FDA proposal to permit unlabelled irradiated food withdrawn after public opposition

1985 *US Department of Energy (DOE) proposes six demonstration plants
*Campaigns launched by US Health and Energy Institute, National Coalition to Stop Food Irradiation, Food and Water and others
*London Food Commission establishes working group on food irradiation.

1986 *US FDA permits pork,fruit and vegetables (up to 1 kGy) and spices (up to 30 kGy)
*Abuse of irradiation uncovered. British food companies irradiate seafood in the Netherlands to hide bacterial contamination - known in the trade as 'dutching'
*UK ACINF Committee reports no special safety problems with irradiated food up to 10 kGy. MPs question controls to prevent dutching and conflict of interest of ACINF technical advisor
*IAEA Marketing Strategy outlines worldwide campaign for promoting food irradiation
*First meeting of Food Irradiation Network - groups opposing irradiation held in the Netherlands
*Opinion poll in New Zealand/Aotearoa finds overwhelming opposition to irradiated food
*Denmark permits irradiated spices revokes permit for potatoes

1987 •London Food Commission launches Food Irradiation Campaign to retain UK ban on irradiation with support of consumers, environmental groups, trade unions, public health, farmers and food industry representatives
•Public opinion polls find 93% of UK population and 75% of Canadians oppose food irradiation
•UK food manufacturers body reverses position, calls for ban
•Leading UK supermarket chains declare opposition to selling irradiated food
•British Medical Association criticises ACINF, suggests possible long term health risks
•European Parliament votes against general clearance and for research on alternative preservation methods
•International Union of Foodworkers (IUF) calls for Europe-wide ban on irradiation
•Further 'dutching' scandal - Danish mussels
•US irradiated mushrooms scandal - Quaker Oats Co
•European Scientific Committee endorses 1980 JECFI position
•12th IOCU World Congress calls for moratorium until safety, control and other issues resolved. IOCU office in Penang, Malaysia, coordinates international consumer opposition
•Second European Food Irradiation Network meeting - Brussels
•Canadian Parliament report calls for safety research, recommends ban on irradiation of wheat
•Public demonstrations halt test marketing of irradiated potatoes in Canada and papayas in US and construction of irradiator in New Zealand/Aotearoa
•Australian Consumers Association report to Australian government endorses IOCU position
•California grocers' association opposes irradiated food
•US state of Maine bans sale of irradiated food

1988 •Second UK ACINF report recommends food irradiation but admits insufficient evidence on some safety issues, government retains ban because of concern over controls to prevent abuse
•Caesium leak at US irradiator (Radiation Sterilizers) State investigator calls for tighter regulation and controls
•New Zealand/Aotearoa government bans irradiation
•First meeting of Asia/Pacific Region Food Irradiation Network, Canberra, Australia
•Groups in Canada and Thailand unite to protest Canadian aid money being used to fund Thailand irradiator Similar 'aid' to Jamaica and Malaysia exposed
•IAEA 'research' meeting Bangkok (RPFI phase III) plans promotion of consumer acceptance in the Asia/Pacific region Consumer groups alert President Cory Aquino about plans for promotion in the Philippines
•European Commission proposes directive to force all EEC countries to permit irradiation
•Australian parliament report recommends ban, calls on WHO to reopen safety investigation and produce a proper scientific report
•IAEA/WHO/FAO/ITC-UNCTAD/GATT conference in Geneva to promote food irradiation fails to achieve consensus, rejects statements that there are no unresolved safety problems. 11 of the 54 countries present express reservations about food irradiation
•Public interest groups criticise WHO promotional booklet 'Food Irradiation - a technique for preserving and improving the safety of food' as biased, misleading and inaccurate. ICGFI produces promotion video, TV programme
•Food Irradiation Network (FIN) formally launched

1989 •Consumers force ICGFI to withdraw proposal to cripple existing labelling standards at Codex meeting, Ottawa, Canada
•100 legislators support US federal bill to ban irradiation
•US Congress refuses further funds for DOE irradiator program
•New York and New Jersey ban sale of irradiated food. Ban Bills introduced in Vermont, New Hampshire, Massachusetts, Pennsylvania, Minnesota, Oregon, Washington and California
•Three workers exposed at (Delmed) irradiator in El Salvador
•Martin Welt, (ex-President Radiation Technology) finally convicted for conspiracy over safety violations Forms new company, Alpha and Omega technology, to promote irradiation in SE Asia
•US FDA extends labelling requirement to 1990
•IUF Asia/Pacific Regional Congress opposes irradiation
•Public pressure stops plans for papaya irradiator in Hawaii, seafood irradiator in Alaska and apple irradiator in Washington
•Further 'dutching' of seafood uncovered. Companies under-irradiating to avoid port health detection and re-documenting consignments to avoid customs duty
•Canada extends permits for irradiation
•UK Retail Consortium, representing the major supermarket chains, joins consumer, and public health/food law bodies in demanding the UK ban remain
•European Parliament's Environment Committee votes for Europe-wide ban on irradiation (spices exempted)
•Danish Parliament's Consensus Conference rejects food irradiation as an inappropriate technology
•UK government announces intention to permit irradiation
•Conference on Fate and Hope of the Earth, Managua, Nicaragua, calls for worldwide moratorium on food irradiation
•Food Irradiation Network launches international seafood campaign

1990 •The tide turns ?

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ABUSE OF IRRADIATION - THE "DUTCHING" OF FOOD

The abuse of irradiation - the illegal cover-up of high levels of bacterial contamination - is a major isssue of concern. Contaminated reject foods are frequently sent to the Netherlands where they are irradiated for resale. The practice has become known as 'dutching'. It is only half-heartedly condemned by governments and the international promoters of irradiation.

'Dutching' is difficult to eradicate since there are no reliable methods for detecting whether a food has been irradiated and if so, how many times and with what doses. Far from being a treatrnent which can make food safer, irradiation has made obsolete many of the methods which public health agencies use to check that food is wholesome and fit to eat.

The following cases have been reported since 1986. Health officials and honest food traders believe that the documented cases are just the tip of the iceberg.

o Young's ('Admiral' brand) prawns (UK)

In 1986 a consignment of Malaysian prawns originally imported into the UK by Young's Seafoods (now part of the US/UK Hanson Trust) was found to be contaminated. The prawns were shipped to Gammaster irradiation plant in the Netherlands, irradiated, illegally reimported into Britain and sold under the 'Admiral' label.

o Flying Goose ('Dan-Maid' brand) prawns (Sweden)

The Flying Goose company, part of the International Allied Lyons group, irradiated contaminated prawns using the IRE plant in Belgium before shipping them to Sweden. Sweden prohibits the importation of irradiated food. The company claimed the shipment was a mistake and the practice would not continue*. The consignment was rejected by the customer in Sweden following a tip-off and re-exported. The Flying Goose company is believed to have legally sold it as a reject consignment. Its final destination is unknown but reports from within the food trade indicate that it changed hands several times and may have been repackaged to remove the original brand labels.
* See below: A regular trade in 'dutched' seafood

o Insurance rackets

The International Maritime Bureau is investigating cases of possible insurance fraud where seafood and frogs legs may have been over-insured before being rejected by authorities in the US. After the insurance claims have been made, the consignments are said to be resold as reject lots and then 'dutched' in Europe.

o Romoe-Musell mussels (Danmark)

The Dutch parent company of the Danish Roemoe Musell company was fined in 1988 for importing 32 tonnes of irradiated mussels. Danish authorities had rejected them because of contamination with E. coli bacteria. The company sent them to Gammaster for irradiation and illegally re-imported them into Denmark. Gammaster was not prosecuted. The product was being irradiated for export! Gammaster which claims that food is tested for bacterial contamination before being irradiated.

o **Baby food (Wakado, Meiji and Snow brands) (Japan)**

From 1974-78 the Na-Kagami Shokuhin company, a subcontractor to Japanese food processing companies Wakodo, Meiji and Snow Brand, irradiated vegetables for baby foods in containers labelled 'animal feedstuffs'. The fraud was discovered when a driver reported that the boxes had been relabelled 'vegetables for babyfood' on the way back from the Radiye Kogyo irradiation plant. The company president was given an eight month prison sentence.

o **Quaker Oats (Golden Grain brand) products (US)**

In the US it is permitted to irradiate spices at 30 kGy as opposed to 1 kGy for vegetables. In 1988, the Quaker Oats company used illegally irradiated dried mushrooms in two of its products - Golden Grain Chicken and Mushroom Rice-a-Roni and Chicken and Mushroon Noodle-Roni. The Taiwanese mushrooms were imported by Cade-Grayson company, California, and were given ten times the dose permitted for vegetables in the US at the plant of Precision Materials Corporation, Mine Hill, New Jersey. Quaker Oats/Golden Grain has stopped using irradiated mushrooms.

o **A regular trade in 'dutched' seafood**

In June 1989, a UK journalist posing as a representative of non-existent seafood company, showed how easy it would be to import irradiated seafood. A British House of Commons motion identifies connections between Hank DeBruijne, a trader in reject seafood, Gammaster irradiation company, a haulage company recommended by Gammaster, and three UK companies (including Lyons International) who trade with the Dutch companies. In this case the reject seafood originated in Malaysia. Product from Oman, Bangladesh, Pakistan and Taiwan was also offered.

Port health authorities may not be able to detect whether a food has been irradiated, but they become suspicious if food has an abnormally low bacterial load. DeBruijne offers to irradiate at only half the recommended dose. This leaves a low level of residual contamination so as not to arouse suspicions.

o **'Dutching' - a holiday in Holland!**

In August 1989, The Sunday Times revealed how a 16 ton consignment of Indian prawns, condemned by US authorities because of Salmonella, was offered for sale by Landauer, a London firm of commodity brokers. One of Landauer's dealers is reported to have offered to send the prawns 'on holiday to Holland' (another trade expression for irradiating the food in the Netherlands). Landauer's said 'We tell our customers it has been rejected. What they do with it is entirely up to them. We would place them through irradiation for customers.'

A potential profit of £100,000 after irradiation is a considerable incentive for a company to take up an offer like this, provided they can evade the various controls on such abuse.

Source London Food Commission: Food Irradiation - The Myth and the Reality (Thorsons, UK, 1990).

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ACCIDENTS AT IRRADIATION FACILITIES

Irradiation is a hazardous process. Exposure to the unshielded source can be a fatal. Routine exposures to even low levels may cause long-term harm. The radioactive materials have to be transported into the plant, the spent sources (still radioactive) removed and any contaminated material disposed of.

Accidents may happen at any stage, causing exposure of workers, the public and the environment. Often, lack of local expertise means that maintenance teams have to be flown in from overseas to deal with emergencies.

The following accidents all happened in plants built and operated under the internationally agreed system of regulation and control. Trade unions with members in the food industry have reason to be concerned about the health and safety of their members.

o Radiation Technology Inc (RTI), New Jersey, USA.

In 1986, the US Nuclear Regulatory Commission (NRC) revoked the RTI licence for repeated wilful violations of worker and environmental safety. Incidents included by-passing safety interlock systems resulting in exposure of a worker to the unshielded source (1977) and illegally burying contaminated material from a leaking Cobalt 60 source (1975).

Martin Welt, the company president, ordered employees to lie to the NRC investigators. The NRC action resulted in his resignation. The US Department of Energy (DOE) promptly hired him to advise on its food irradiation program. Welt was eventually convicted of conspiracy in the US courts in 1988. His new company, Alpha Omega Technology, has approached the World Bank for funds to build irradiation facilities in South East Asia.

o Isomedix, New Jersey, USA.

A leaking source contaminated the pond water which was then disposed of down the toilets, contaminating the sewerage system, and exposing workers to radiation. Workers reported the cover-up. Radioactive contamination was still detectable five years later.

The NRC has cited the company for allegedly overexposing workers, failing to signpost radiation areas, allowing food and cigarettes in radiation areas, operating without authorised personnel and failing to monitor water disposed to the sewer.

o International Nutronics, New Jersey, USA.

The company was fined in 1986 after cover-up of a radioactive spill in 1982. Management ordered employees to dispose of the radioactive water down shower stalls, and move their radiation badges from belt to collar to record a lower dose. The contamination was still detectable outside the building ten months later.

o Hawaii Demonstration Irradiator, USA.

A radioactive leak at an irradiator in Hawaii in 1967 contaminated the pond water, shipping cask, roof, machine room, tools and workers' clothing. The cleanup cost the state $385,000 in 1979. Dangerously high levels of contamination were still detectable outside the building in 1980.

o **Radiation Sterilizers Inc, Georgia, USA.**

A leaking caesium source in June 1988 contaminated the pond water, workers' clothing, cars, and home carpets,as well as some of the irradiated products including medical supplies and milk cartons. The clean-up was still, in the going on in 1989 with at a cost of several million dollars. The investigating team recommended that new regulations on radiation safety and emergency plans are needed for all US irradiators.

o **University of Tennessee, USA.**

A worker bypassed the safety system of an irradiation facility at the University of Tennessee in 1971. He survived the high dose of radiation.

o **Becton Dickinson, North Canaan Connecticut. USA.**

Aluminium boxes containing products being irradiated, jammed into the source rack in 1981, preventing it from being lowered. Despite this, the control panel indicated that the cobalt source was safely inside its storage pool. It was only the radiation monitors indicating high radiation levels that warned of the problem. Technicians had to be called in from AECL, Canada, (now Nordion). While lowering the rack they dislodged several cobalt rods which had to be recovered using long-handled tools and mirrors.

o **Stimos, Pontecico, Italy.**

A maintenance worker entered the irradiation cell of a corn irradiation facility on the conveyor belt while the source was operational. He received a high radiation dose and died 12 days later.

o **Institute for Energy Technology Irradiation Plant, Kjellet, Norway.**

Failure of safety devices allowed a maintenance technician to enter the iradiation cell with the source exposed. He died 13 days later.

o **Delmed plant, San Salvador, El Salvador.**

Three workers at the Delmed plant received serious radiation injuries after irradiation equipment malfunctioned in February 1989.Delmed had to call Nordion, the suppliers of the plant, to send a maintenance team from Canada to remove the cobalt from the defective source rack.

o **Steritech, Dandenong, Australia.**

This plant had to be shut down for five days because a wire cable controlling the Cobalt 60 source rods had jammed, preventing the rods being lowered into the pool. A maintenance team had to be flown from Canada to remedy the problem. Technicians and equipment to deal with such emergencies are not available in Australia.

Source: London Food Commission: Food Irradiation - The Myth and the Reality (Thorsons, UK ,1990).

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RESOLUTION ON FOOD IRRADIATION

ADOPTED BY THE FOURTH BIENNIAL CONGRESS ON THE FATE AND HOPE OF THE EARTH

(MANAGUA, NICARAGUA, 5-9 JUNE, 1989)

Believing that the potential benefits of food irradiation, particularly its need and appropriateness, have been generally overplayed, while its potential problems, particularly its safety and control, have been grossly underplayed;

Realizing that controls on the use and abuse of food irradiation cannot be adequately enforced or monitored in the absence of reliable tests to detect irradiated foods;

Concerned that the effects of irradiation on pesticide residues in food have not been sufficiently studied;

Reiterating that the bulk of agricultural pesticides are applied pre-harvest - as such, a post-harvest technology like food irradiation would not reduce the total amount of agricultural pesticides manufactured, traded or used in any significant manner;

Noting that in many Third World countries, the improper transportation and storage of grains and other foods, coupled with the scourge of rodents, contribute substantially to post-harvest food losses - a situation that will not be solved by food irradiation;

Understanding that food irradiation will involve the use of other chemical additives to maintain or enhance the organoleptic properties of irradiated foods;

Recognizing that the nuclear industry worldwide is facing severe economic difficulties and is promoting the proliferation of nuclear technologies, including food irradiation, at any cost, in order to keep itself alive;

Noting that the use of food irradiation implies greater centralization of food production systems, removing local control from small producers and thus potentially contributing to food shortages and increased hunger;

Recalling that food irradiation is being aggressively promoted, despite widespread opposition by consumer, environmental and other citizens groups;

We, the participants of the Fourth Biennial Congress on the "Fate and Hope of the Earth", in Managua, Nicaragua, 5-9 June, 1989;

Declare that all attempts to foist food irradiation, particularly on Third World countries, without the active and informed participation of independent, public interest, citizens groups be thwarted;

Urge that the World Health Organization (WHO) reopen and thoroughly investigate all aspects of safety associated with irradiation;

Urge that the World Bank, other international financial institutions and aid agencies not include food irradiation projects in their foreign aid programmes, particularly in the case of Third World countries;

Call for a global moratorium on the further use and development of food irradiation, unless and until all issues relating to its need, appropriateness, safety, detectability, labelling, wholesomeness, control and overall costs to society and the environment have been fully evaluated and subjected to public scrutiny;

Support the activities of the Food Irradiation Network (FIN) in fostering closer cooperation and coordination amongst citizens group working on the issue of food irradiation using the resources that FIN will make available.

The above declaration was adopted unanimously by more than 1,200 participants from more than 60 nations (representing numerous groups and organisations from every continent) who met in Managua, Nicaragua, between 5-9 June, 1989, for the Fourth Biennial Congress on the Fate and Hope of the Earth to discuss strategies on development, environmental conservation and restoration, peace and disarmament. The Congress explored the linkages between these issues and shared experiences in order to forge cooperative efforts to move towards global sustainability.

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I.

FIN NEWS BRIEFS

FIN National Profiles

Future issues of FIN LINK will contain brief profiles on the situation in a number of countries. Some of these are in production. Some are awaiting information from the network. The profiles will contain information on

1. Permits for food irradiation (or government policy)
2. Facilities available (and planned) for irradiating food
3. Foods likely to be irradiated for home consumption, export and likley imports
4. Major food trading partners where irradiaton might be involved
5. FIN contacts.

As an example see FIN COUNTRY PROFILE - P1 - Malaysia.

FIN Fact Sheets

The first three - history, abuses, and accidents - are included in this issue of FIN LINK.
In production are fact sheets on

- the IAEA marketing strategy
- the safety of irradiated food
- food irradiation and food poisoning.

Suggestions (and content) for other titles are welcomed.

FIN Graphics

Included in this issue of FIN LINK is a graphic highlighting the way irradiation acts as a cover for low quality food. Examples of other graphics you have found useful are welcome.

FIN News Briefs

Future issues of FIN LINK will contain brief reports on developments around the world and contacts for further information. In this issue we highlight:

1. The US Campaign to Stop Food Irradiation

Despite permits for food irradiation in the US since 1963 there is no irradiated food openly sold in the US. Test marketing trials of papaya and potatoes were called off after consumer opposition. Three states, Maine, New York and New Jersey have banned the sale of irradiated food. Legislation is pending in 10 other states. 100 federal legislators have supported legislation to ban irradiation and force fuller scientific investigation of its safety. None of the six demonstration irradiation facilities planned by the government in 1986 have been built. A nation-wide petition is being organized and the support for this used to pressure food companies to declare they will not use irradiation. There is a network of groups campaigning to stop food irradiation in most of the 50 states. The US national coordinating groups work closely with contacts in Canada, Asia/Pacific and Europe. More work needs to go into contacts with Latin America and the Caribbean.
For further information contact Food and Water Inc., USA.

2. The Thailand/Canada Initiative

A successful letter writing campaign drew international press coverage for opposition to the Thailand/Canada irradiation agreement. FIN groups in each country wrote to the Canadian and Thai premiers protesting against the proposal to construct an irradiation facility in Thailand, using Canadian aid funds, and sell the food irradiated there to Canada. The plant has been in operation since mid 1989. Plans for CIDA to fund irradiation facilities in Malaysia and Jamaica were uncovered as a result of this campaign.

3. The International Seafood Campaign

The 'dutching' of food (see FIN Factsheet - F2 - Abuse of Food Irradiation) hurts the seafood trade in developing nations. It also hurts reputable traders who have never needed irradiation. An international campaign has been launched to produce a positive list of companies - exporters in developing countries, importers in N America, Europe, Japan and Australasia - who can guarantee they provide quality, clean seafoods and not irradiated, contaminated seafoods.

For further information about the campaign, contact the London Food Commission, UK, or any of the other FIN Regional Contact Points.

4. Promotion Conference on Food Irradiation

As part of the global marketing strategy, a number of UN agencies held a conference on 'the acceptance, control of and trade in irradiated food' in Geneva, Switzerland, 12-16 December, 1988. The conference failed to achieve what the organizers hoped for. The organizers were forced to:

- stage a special session to discuss safety and abuse of irradiation
- withdraw a statement that there were no unresolved safety issues
- withdraw a proposal that governments should promote irradiation

11 of the 54 countries present expressed reservations about food irradiation.

The World Health Organization's promotional booklet on food irradiation, which was distributed at the Geneva conference, was described as being "biased, misleading and inaccurate" by the citizens groups present at the conference. A critique of the WHO booklet is available from the London Food Commission, UK.

Further information and references:
IAEA report on the Geneva conference (ISBN 92-0-010189/5 ISSN 0074.1989).
Consumer report on the Geneva conference and briefing kit is available from the International Organization of Consumers Unions, Malaysia.
'Food Irradiation - a technique for preserving and improving the safety of food' (ISBN 92 4 154240 3, WHO 1988).

5. Japan

We are often told Japan permits irradiation of potatoes. The fact is that the use of irradiated potatoes has fallen dramatically from 21 000 tons/year in 1976 to around 8 000 tons/year in 1989. The Japanese government withheld these figures and also withheld reports from the food irradiation safety research program of the Japan Atomic Energy Commission. Leaked reports indicate adverse effects on the health of animals fed irradiated potatoes and onions. Japan refused to give clearance for irradiated onions. No food imported into Japan is allowed to be irradiated.
Further information from Mrs K Hamatami, Sonan 2-10-10, Sagamihara City, Kanagawa, Japan.

6. Europe

The European Commission proposes a Directive to force all EC nations to permit irradiation by 1992. This is opposed by West Germany and Denmark. The British government decided to permit irradiation in 1990, against widespread opposition from the British Medical Association, large supermarkets, consumer organizations. The European Parliament's Environment Committee voted for a general ban on irradiation (with spices the only exception).
Further information and developments from the London Food Commission, UK.

7. Australia and New Zealand

The New Zealand government banned irradiation in 1988, finding that there is no need for the technology. An Australian parliamentary committee also recommended a ban in 1988, and called on the WHO to reopen the scientific investigation into issues of safety and nutrition. An statement of the official Australian government position is expected in late 1989.
Further information from Mark Lawrence, Food Preservers Union of Australia, 227 Regency Rd, Croydon Park 5008 SA, Australia.

8. Latin America

La Voz del Consumidor has devoted an entire issue (Vol. 7 No.1 1989) to food irradiation, providing a comprehensive analysis of the issues written in Spanish.
For further information contact: Asociacion Mexicana de Estudios para la Defensa del Consumidor, Mexico.

9. Africa

The Environment Liaison Centre International, Kenya, has produced and will make available upon request a special issue of ECO-PROBE on food irradiation.

FUTURE ISSUES

Information for future issues of FIN LINK should be sent to any of the five FIN Regional Contact Points (see back page of cover sheet of this issue of FIN LINK for addresses).

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K.

PROFILE ON MALAYSIA

FOOD IRRADIATION PERMITS

None.
No food can be irradiated except with permission of the Director-General of the Ministry of Health.

IRRADIATION FACILITIES

- Research facility (cobalt), University of Malaya, operating since 1974.
- Research and demonstration facility (cobalt), Puspati, at Bangi in the state of Selangor. Operated by the Nuclear Energy Unit, Prime Minister's Department. Funded jointly by Malaysian government and Canadian International Development Agency (CIDA).
- Commercial medical supplies facility (cobalt) in Malacca. Operated since 1979 by Ansell-Sterltech (part of Dunlop International).

POTENTIAL EXPORT FOODS TARGETED FOR IRRADIATION

- Pepper (black and white): about 95% of pepper production is exported, mainly through Kuching and Sarawak.
- Shrimp: mostly cooked, peeled and frozen. About 10 large companies export mainly to US, Australia, Belgium, Netherlands, Sweden. Some of these exports are currently irradiated ('dutched') in The Netherlands.
- Cocoa beans: about 85% production exported. There can be problems with irradiation because of the high fat content. Transport and marketing infrastructure would need to be developed before irradiation could be used.
- Fruit (bananas, pineapple, possibly others): little data available on efficacy of irradiation for these products in Malaysia.

Summary

Infrastructure for irradiation generally is lacking. Handling and storage methods would need to be changed significantly. Impact on rural economy has not been investigated. The European Commission's FAST report indicates potential economic problems which may be relevant to Malaysia.

POTENTIAL IMPORT FOODS TARGETED FOR IRRADIATION

- Rice: about 15% of Malaysia's rice is imported and usually stored for up to 18 months (the locally grown rice is sold first). Main entry points are the ports of Kelang, Penang and Kuching. Jute and woven polypropylene packaging materials would have to be replaced by plastic to make irradiation usable. The International Atomic Energy Agency is sponsoring 'research' on consumer acceptance of irradiated rice within the Asia/Pacific region.

REFERENCE SOURCES

- FAST Report. Developments and Issues Relating to Food Irradiation in Europe. Forecasting and Assessment in Science and Technology Report No.134 Directorate-General for Science, Research and Development, Commission of the European Communities, Jan 1987.
- Assessment of Market Potential for Canadian Food Irradiation and Related Technologies in Thailand and Malaysia. Prepared for Canadian External Affairs, SE Asia Trade and Development Section, by Atomic Energy of Canada Radiochemical Company Ltd.(now called Nordion), January 1986.

FIN PARTNER

For more information about the situation in Malaysia, contact: Josie Zaini, Education and Research Association for Consumers, 11 Kilat Lane, Off Jalan Silibin, 30100 Ipoh, Perak, Malaysia.

—oo—

INTERNATIONAL ORGANIZATION OF CONSUMERS UNIONS (IOCU)
MEMBERS:

ASSOCIATES IN 1988

Australia
Australian Consumers' Association
Australian Federation of Consumer Organizations Inc.
Canberra Consumers Inc.

Austria
Verein für Konsumenteninformation

Bangladesh
Consumers' Association of Bangladesh (CAB)

Belgium
Association des Consommateurs/ Verbruikersunie

China
China Consumers' Association

Cyprus
Cyprus Consumers' Association

Denmark
Forbrugerrådet

Fiji
Consumer Council of Fiji

Finland
Kuluttajat-Konsumenterna ry

France
Union Fédérale des Consommateurs

Germany, F.R.
Arbeitsgemeinschaft der Verbraucherverbände
Stiftung Warentest

Hong Kong
Consumer Council

Iceland
Neytendasamtökin

India
Consumer Guidance Society of India

Indonesia
Yayasan Lembaga Konsumen Indonesia (YLK)

Ireland
Consumers' Association of Ireland

Israel
Histadrut Consumers' Protection Authority
Israel Consumer Council
Israel Consumers' Association

Jamaica
National Consumers' League

Japan
Nihon Shohisha Kyokai
Nihon Shohisha Renmei

Korea
Citizen's Alliance for Consumer Protection of Korea
Consumers Union of Korea

Luxembourg
Union Luxembourgeoise des Consommateurs

Malaysia
Consumers' Association of Penang
Federation of Malaysian Consumers Associations
Selangor and Federal Territory Consumers Association

Mauritius
Association des Consommateurs de l'Ile Maurice

Mexico
Asociacion Mexicana de Estudios para la Defensa del Consumidor

Netherlands
Consumentenbond
Stichting Vergelijkend Warenonderzoek

Netherlands Antilles
Fundashon pa Konsumidó

New Zealand
Consumers' Institute of New Zealand Inc.

Norway
Forbrukerrådet

Philippines
Consumers Federated Groups of the Philippines, Inc.
Kilusan NG MGA Mamimili NG Pilipinas Ink

Spain
Organització de Consumidors i Usuaris de Catalunya
Organizacion de Consumidores y Usuarios

Switzerland
Fédération Romande des Consommatrices
Konsumentinnenforum der Deutschen Schweiz

United Kingdom
Association for Consumer Research
National Consumer Council
National Federation of Consumer Groups
Research Institute for Consumer Affairs

United States of America
American Council on Consumer Interests
Consumer Federation of America
Consumers Union of United States, Inc.
(Consumer Reports)

SUPPORTING MEMBER

Sweden
Konsumentverket

M.

CORRESPONDENTS IN 1988

Argentina
Accion del Consumidor
Fundación Salud Publica
Liga de Amas de Casa de la República Argentina
SUMAR - Asociación de Consumidores de la República Argentina

Australia
Business and Consumer Affairs
Consumer Action Movement
Consumer Affairs Bureau, Queensland
Consumer Affairs Council of the Australian Capital Territory
Consumer Affairs Council, Northern Territory
Consumer Affairs Council of Tasmania
Consumers' Association of Victoria
Federal Bureau of Consumer Affairs
Ministry of Consumer Affairs
National Consumer Affairs Advisory Council
Trade Practices Commission

Belgium
Bureau Européen des Unions de Consommateurs
Centre de Droit de la Consommation

Brazil
Comissao Municipal de Defesa do Consumidor do Rio de Janeiro
Conselho Nacional de Defesa do Consumidor
Coordenadoria de Proteçao e Orientaçao ao Consumidor
Grupo Recifence de Defesa do Consumidor de Medicamentos
Instituto Brasileiro de Defesa do Consumidor
PROCON-MS - Secretaria Executiva de Orientaçao e Proteçao ao Consumidor
PROCON-SP - Grupo Executivo de Proteçao ao Consumidor

Canada
Department of Consumer and Corporate Affairs
Office de la Protection du Consommateur
Service d'aide au Consommateur

Chile
Asociacion Chilena de Defensa del Consumidor

Colombia
Confederacion Colombiana de Consumidores

Costa Rica
Asociacion Costaricense de Defensa del Consumidor

Cuba
Instituto Cubano de Investigaciones y Orientacion de la Demanda Interna

Dominican Republic
Departamento de Educacion al Consumidor

Ecuador
Centro Ecuatoriano para la Promocion y Accion de la Mujer
Direccion Nacional de Proteccion al Consumidor del Instituto Ecuatoriano de Normalizacion

Finland
Kuluttajaneuvosto
Suomen Kuluttajaliitto ry

France
Organisation Générale des Consommateurs

Germany, F.R.
Bundesforschungsanstalt für Ernährung
Die Verbraucher Initiative

Greece
Instituto Prostasias Katanaloton
Kentro Prostasias Katanaloton

Guyana
Guyana Consumers' Association

Hungary
Kereskedelmi Minőségellenőrző Intézet Kermi

India
Consumer Association
Consumer Education Centre
Consumer Education and Research Centre
Consumer Protection Council
Indian Federation of Consumers Organisations
Jagrut Grahak
Karnataka Consumer Service Society
Visakha Consumers' Council

Ireland
Office of Consumer Affairs and Fair Trade

Israel
Consumer and Price Division, Ministry of Trade and Industry

Italy
Associazione Italiana Agricoltura Alimentazione Salute
Difesa del Consumatore Quaderni di Controinformazione Alimentare

Japan
Kokumin Seikatsu Center
Shodanren

N.

Japan (Contd.)
Shufurengokai
Yakugai Joho Center

Kenya
African Council on Communication Education
Kenya Consumers' Organization
Public Law Institute

Korea
Korea Consumer Council
Korean Women's Association
National Council of Consumer Protection Organizations

Malaysia
Education and Research Association for Consumers, Perak
Pahang Association of Consumers

Mauritius
Mauritian Action for the Promotion of Breast Feeding & Infant Nutrition

Malta
Consumers' Union of Malta

Mexico
Instituto Nacional del Consumidor

Netherlands
Ministerie van Economische Zaken, Direktie Consumentenbeleid
Stichting Consument en Veiligheid
Stichting Wetenschappelijk Onderzoek Konsumentenaangelegenheden

New Zealand
Ministry of Consumer Affairs, Department of Trade and Industry

Nigeria
Consumer Education and Protection Council of Nigeria
National Consumers Nigeria

Norway
Forbrukeravdelingen, Forbruker-og Administrasjonsdepartementet
Forbrukerombudet
Statens Institutt for Forbruksforskning

Peru
Comité Peruano Pro-Alimentacion Infantil

Philippines
Church-Based Consumers' Movement
Citizens' Alliance for Consumer Protection

Poland
Rada Krajowa Federacji Konsumentow

Portugal
Associaçao Nacional dos Consumidores
Associaçao Portuguesa para a Defesa do Consumidor
Instituto Nacional de Defesa do Consumidor

Puerto Rico
Departamento de Asuntos del Consumidor

Senegal
Environnement Developpement Action Tiers Monde

Spain
Confederacion Estatal de Consumidores y Usuarios
Direccion de Consumo del Gobierno Vasco
Federacion de Consumidores de Euzkadi
Federacion Española de Asociaciones de Amas de Casa, Consumidores y Usuarios Institut Català de Consum
Union de Consumidores de España
Union de Consumidores de España

Sweden
Kooperativa Konsumentgillesforbundet

Switzerland
Schweizerische Stiftung für Konsumentenschutz
Schweizerischer Konsumentenbund

Thailand
Consumer Affairs Project
Consumer Protection Association
Consumers Group of Siam
Thai Association of University Women
Voluntary Group for Consumers of Thailand

Turkey
Consumer Bureau Türk-is

United Kingdom
European Research into Consumer Affairs
Office of Fair Trading

United States of America
New York City Board of Education Employees, Local 372

Uruguay
Coordinadora de Grupos de Consumidores de Uruguay
Direccion Nacional de Comercio y Abastecimento
Liga Uruguaya de Defensa del Consumidor

Zimbabwe
Consumer Council of Zimbabwe

HB35

Dear House of Education and Social Services Committee 5-1-91

I am writing in regards to an irradiator plant that is trying to be built in Alaska. It brings me to tears just thinking about how all of our childrens and grandchildren lives will be adversely effected by this. It is a grave concern in my household.

First of all, I have children that absolutely cannot tolerate anything other than whole-natural foods. Their bodies just give out otherwise. And if it weren't for the God given natural foods - my children would not be here with us today. Just a matter of fact.

Also I don't understand what the need for irradiation is for anyway. Food does not need to be preserved for so long like their studies indicate. We believe the reason they want this is for the windfall profits. (LET THE GOVERNMENT FOOT THE BILL). After all, a strong promoter of irradiated food is a criminal of convicted felons involving his irradiator facility. He's petitioning the FDA to approve sea-food for the process.

We also believe that the American people are being used as guinea pigs as they were during WW II nuclear

testing. We question the effects this food has upon consumption but also the nutritional value of the food itself once radiated.

We are asking you to protect our food by advocating thorough, peer-reviewed, scientific, long term research conducted on the effects of eating irradiated food BEFORE the process is utilized commercially and ② studies be conducted on the dangers and costs to workers and consumers of using high-level nuclear waste by-products like Cesium to irradiate our food.

We ask you to support HB-35. It's for our families, now and later.

Sincerely

Mr & Mrs. Charles Nichols
3081 Zulu Ct
North Pole, AK 99705

FISCAL NOTE

STATE OF ALASKA
1991 LEGISLATIVE SESSION

BILL NO. HB35

Revision Date: _____ Department Affected: Environmental Conservation

Title: An Act prohibiting the knowing sale of irradiated food. BRU: Environmental Health

Component: Sanitation

Sponsor: Rep. Phillips

Requestor: Rep. Phillips COMPONENT SERIAL NO. | | 6 | 5 | 0 |

Expenditures/Revenues: (Thousands of Dollars)

OPERATING	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	-0-	-0-	-0-	-0-	-0-	-0-
CAPITAL	-0-	-0-	-0-	-0-	-0-	-0-
REVENUE	-0-	-0-	-0-	-0-	-0-	-0-

FUNDING: (Thousands of Dollars)

GENERAL FUND	-0-	-0-	-0-	-0-	-0-	-0-
FEDERAL FUNDS	-0-	-0-	-0-	-0-	-0-	-0-
OTHER	-0-	-0-	-0-	-0-	-0-	-0-
TOTAL	-0-	-0-	-0-	-0-	-0-	-0-

POSITIONS:

FULL-TIME	-0-	-0-	-0-	-0-	-0-	-0-
PART-TIME	-0-	-0-	-0-	-0-	-0-	-0-
TEMPORARY	-0-	-0-	-0-	-0-	-0-	-0-

Estimate of current year impact: -0-

ANALYSIS: (Attach a separate page if necessary.)

See attached.

Prepared By: Douglas C. Donegan, Director Phone: 465-2696

Division: Environmental Health Date: January 22, 1991

Approved by Commissioner: _____

Agency: Department of Environmental Conservation Date: _____

Distribution (by preparer): Legislative Finance, Legislative Sponsor, Requestor, OMB, & Impacted Agency(ies).

Rev 10/90

FN @ DEC

ANALYSIS:

We are submitting a zero fiscal note with the understanding that investigation and enforcement will take place on a complaint-basis only. We will not be monitoring retail food establishments for irradiated foods.

STATE OF ALASKA

WALTER J. HICKEL, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

POSITION PAPER

BILL NUMBER: HB 35

TITLE: "An act prohibiting the knowing sale of irradiated food."

DEPARTMENT POSITION:

The Department has not taken a position on this bill due to the fact that the Department's expertise is in inspecting the sanitary operation of food production facilities; we do not have any staff with training or experience in the irradiation of food.

ANALYSIS:

U.S. Food and Drug Administration (FDA) Requirements

The FDA has concluded that food irradiated at doses up to 1 kilogray is wholesome and safe for human consumption, even where the food that is irradiated may constitute a substantial portion of the diet. FDA has approved the following application dosages: for foods which comprise more than 0.01% of the daily diet, the treatment dosage cannot exceed 1 kilograys (kGy); for foods which comprise less than 0.01% of the daily diet (such as spices), treatment dosage cannot exceed 30 kGy. FDA's position is that the chemical difference between foods irradiated at doses allowed by this regulation and non-irradiated foods are too small to cause concern about the safety of irradiated foods.

FDA Approves Sources of Irradiation

Approved ionizing irradiation sources include: radioactive isotopes (Cobalt-60 and Cesium-137) and machines (x-ray or eletron beam).

FDA Foods Approved for Irradiation

FDA has approved the application of irradiation for the treatment of foods under the following conditions: for control of Trichinella spiralis in pork carcasses or fresh, non-heat treated processed cuts of pork carcasses; for growth and maturation inhibition of fresh foods; for inhibition of arthropod pests in food; for microbial disinfection of dry or dehydrated enzyme preparations; for microbial disinfection of vegetable substances (spices) when used as ingredients in small amounts solely for flavoring/aroma; and for control of foodborne pathogens in certain fresh or frozen, uncooked poultry products.

FDA Labeling Requirements

FDA requires that treated products (other than spices) have a label statement which contains the international irradiation

process logo (tulip) and the statement "treated with radiation" or "treated by irradiation".

Department Role

The Department wound enforce the provisions of this bill on a complaint only basis. When a complaint was received, the alleged violation would be investigated through review of food products held at food distributors, warehouses and retail and wholesale outlets as appropriate. Product would be inspected for the federally required irradiation symbol and product statement. If irradiated food was found, the department would embargo the product under the authority of AS 17.20.230 and require that it be destroyed or returned to an out-of-state distributor.

John A. Sandor, Commissioner

HB

38

Alaska State Legislature

HOUSE OF REPRESENTATIVES

REPRESENTATIVE FRAN ULMER

MEMORANDUM
February 12, 1991

TO: Rep. Georgianna Lincoln, Co-Chair
Rep. Pat Carney, Co-Chair
House Health, Education and Social Services Committee

FROM: Rep. Fran Ulmer

RE: HB 38 and HB 39, Forward Funding for Education

HB 38 creates a "forward funding for education account" which would allow the state to fund public education one year in advance. Under the current conditions, school districts do not know what their funding levels will be until the legislature makes final budget decisions in the late spring. By that time, school districts have already passed their deadlines for planning the next year's programs and are either issuing lay-off notices or advertising for new positions. Those program and staffing decisions are being made without clear knowledge of the district's actual ability to obtain necessary funding.

HB 38 would redress this problem by allowing school districts to know state funding levels well in advance of their own budget preparation. Program and personnel decisions would enjoy the continuity and stability necessary for effective service delivery. There are multiple benefits for both municipal government and local school districts that result from being able to accomplish program planning with certainty regarding revenues.

HB 39 provides the funds necessary for forward funding by appropriating the balance of the general fund at the end of the fiscal year to the forward funding for education account. The general fund balance would be appropriated to the forward funding account each year until the total amount deposited reaches $700 million. When that goal is reached, school districts would begin receiving education funding from the forward funding account for the fiscal year after the year in which the goal was reached. The legislature would continue to make annual appropriations for public education as part of the normal budget process but those education appropriations would be placed in the forward funding account for disbursement at the appropriate time. HB 39 provides for the repeal of general fund balance appropriation when the total amount of $700 million has been deposited in the forward funding account.

District 4B — Juneau
P.O. Box V • Juneau, Alaska 99811-3100 • (907) 465-4947

JUNEAU SCHOOL DISTRICT BOARD OF EDUCATION

RESOLUTION #12-89

A RESOLUTION OF THE CITY AND BOROUGH OF JUNEAU SUPPORTING FORWARD FUNDING FOR PUBLIC EDUCATION.

WHEREAS, the right to a free education for every child has been universally recognized, and in Alaska is mandated by Article VII, Section 1 of the Alaska State Constitution; and

WHEREAS, education provides the opportunity for reaching personal fulfillment and economic self-sufficiency; and

WHEREAS, to fail to provide that opportunity penalizes not only the individual child, but also the society as a whole; and

WHEREAS, Federal revenues for education have become increasingly more unpredictable; and

WHEREAS, current state revenue has been unpredictable and future state oil revenues are projected to decrease with the gradual decline of Prudhoe Bay production, making State general fund support of public education more difficult and uncertain; and

WHEREAS, dramatic swings in funding for education cause serious disruptions in the delivery of educational services to the great detriment of school age children in Juneau; and

WHEREAS, a fund which has been established from lapsed public school foundation and construction monies and money from the judicial decision on Dinkum Sands and North Slope royalty cases could provide critically important long-term, stable funding for public education in Alaska.

NOW THEREFORE, BE IT RESOLVED BY THE BOARD OF EDUCATION OF THE CITY AND BOROUGH OF JUNEAU, ALASKA:

1. That the Board of Education of the City and Borough of Juneau supports and endorses HB189 and HB190 creating a "forward fund" for public education in the State of Alaska.

2. That this resolution shall be effective March 21, 1989.

Adopted this 21st day of March, 1989

David Crosby, President

Attest:

Charlotte Richards, Clerk

HOUSE COMMITTEE REPORT

(7)

Date Referred: January 21, 1991 FURTHER REFERRALS: Finance

Date of Committee Action: 2/13/91

The HEALTH, EDUCATION AND SOCIAL SERVICES Committee considered: HB 38

HOUSE BILL NO. 38 FORWARD FUNDING FOR EDUCATION ACCOUNT

"An Act relating to the forward funding for education account; providing for lapse of funds in the public school foundation account; and providing for an effective date."

RECOMMENDATIONS: [ ] the same title
be replaced with _____ [ ] a new title

[ ] have attached amendments(s)
[ ] do pass
[ ] do not pass
[ ] no recommendations
[X] individual recommendations
[ ] additional referral to the _____ Committee

ADOPTS: _____ letter of Intent

ATTACHES NEW FISCAL NOTE(s): (Dept) APPROVES PREVIOUS: (Dept/Date)

[ ] fiscal impact _____ [ ] fiscal note(s) _____

[ ] zero fiscal note _____ [ ] zero fiscal note(s) _____

SIGNING DO PASS: SIGNING OTHER RECOMMENDATIONS:

	Check appropriate column:	Do Not Pass	No Rec	Amend
Chris Davis				
Tom Thomas				
Bettye Davis	Jerry Nelson		X	
Mark Baker	John D. Snyder		X	
Mary Miller				

Tom Thomas
Chairman's Signature

FISCAL NOTE

STATE OF ALASKA
1991 LEGISLATIVE SESSION

BILL NO. HB38

Revision Date: _____ Department Affected: Education

Title: Forward funding for education BRU: K-12 Support

Component: Foundation

Sponsor: Ulmer

Requestor: House HESS COMPONENT SERIAL NO. | | 1 | 4 | 1 |

Expenditures/Revenues: (Thousands of Dollars)

OPERATING	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	-0-	-0-	-0-	-0-	-0-	-0-
CAPITAL						
REVENUE						

FUNDING: (Thousands of Dollars)

GENERAL FUND	-0-	-0-	-0-	-0-	-0-	-0-
FEDERAL FUNDS						
OTHER						
TOTAL	-0-	-0-	-0-	-0-	-0-	-0-

POSITIONS:

FULL-TIME						
PART-TIME						
TEMPORARY						

Estimate of current year impact: _____

ANALYSIS: (Attach a separate page if necessary.)

Prepared By: Marv Hakala Phone: 465-2800

Division: Commissioner's Office Date: 2/12/91

Approved by Commissioner: Steve Hole, Acting Commissioner

Agency: Education Date: 2/12/91

Distribution (by preparer): Legislative Finance, Legislative Sponsor, Requestor, OMB, & Impacted Agency(ies).

Rev 10/90

NEA-ALASKA

AFFILIATED WITH THE NATIONAL EDUCATION ASSOCIATION

ANCHORAGE REGIONAL OFFICE
1411 W. 33RD AVENUE
ANCHORAGE, ALASKA 99503
(907) 274-0536

JUNEAU OFFICE
105 MUNICIPAL WAY, SUITE 302
JUNEAU, ALASKA 99801
(907) 586-3090

FAIRBANKS REGIONAL OFFICE
2118 CUSHMAN STREET
FAIRBANKS, ALASKA 99701
(907) 456-4435

February 11, 1991

To: **Representatives Carney and Lincoln, Co-Chairs**
Members, House HESS Committee

Re:

HB 38; *"An Act relating to the forward funding for education account; providing for lapse of funds in the public school foundation account; and providing for an effective date."*

HB 39; *"An Act making a special appropriation to the forward funding for education account; and providing for an effective date."*

NEA-Alaska supports and strongly encourages your favorable consideration of HB 38 and HB 39.

With the high probability of a substantial surplus in the state operating budget at the end of the current fiscal year, **now is the time to establish forward funding of public education in Alaska.**

This potential is enhanced even more by the probability of favorable settlements in various litigation disputes over oil tax revenues.

Forward funding is a statement that public education is a real priority in Alaska. It is a statement by the Legislature of genuine concern for the future of this State.

With forward funding school district planning will be more effective. Continuity of essential programs and services will be enhanced. Students and their parents will be better able to anticipate and plan for their educational future. Employees will find more stability and opportunity in their employment relationships.

We strongly encourage that the Committee also give serious thought to incorporating some form of an "inflation proofing" mechanism as part of this legislation. Funding for public education must keep pace with the rising cost of living. If we can "inflation proof" the Permanent Fund, we can do it for public education as well.

Thank you for your consideration of our recommendations.

Respectfully submitted,

Bob Manners
Executive Director

Don Oberg
President

cc: Representative Ulmer

HB

39

NEA-ALASKA

AFFILIATED WITH THE NATIONAL EDUCATION ASSOCIATION

ANCHORAGE REGIONAL OFFICE
1411 W. 33RD AVENUE
ANCHORAGE, ALASKA 99503
(907) 274-0536

JUNEAU OFFICE
105 MUNICIPAL WAY, SUITE 302
JUNEAU, ALASKA 99801
(907) 586-3090

FAIRBANKS REGIONAL OFFICE
2118 CUSHMAN STREET
FAIRBANKS, ALASKA 99701
(907) 456-4435

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Members, House HESS Committee

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Executive Director

Don Oberg
President

cc: **Representative Ulmer**

Alaska State Legislature

HOUSE OF REPRESENTATIVES

REPRESENTATIVE FRAN ULMER

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Rep. Pat Carney, Co-Chair
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District 4B — Juneau
P.O. Box V • Juneau, Alaska 99811-3100 • (907) 465-4947

JUNEAU SCHOOL DISTRICT BOARD OF EDUCATION

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WHEREAS, a fund which has been established from lapsed public school foundation and construction monies and money from the judicial decision on Dinkum Sands and North Slope royalty cases could provide critically important long-term, stable funding for public education in Alaska.

NOW THEREFORE, BE IT RESOLVED BY THE BOARD OF EDUCATION OF THE CITY AND BOROUGH OF JUNEAU, ALASKA:

1. That the Board of Education of the City and Borough of Juneau supports and endorses HB189 and HB190 creating a "forward fund" for public education in the State of Alaska.

2. That this resolution shall be effective March 21, 1989.

Adopted this 21st day of March, 1989

David Crosby, President

Attest:

Charlotte Richards, Clerk

HOUSE COMMITTEE REPORT

(7)

Date Referred: January 21, 1991 FURTHER REFERRALS: Finance

Date of Committee Action: 2/13/91

The HEALTH, EDUCATION AND SOCIAL SERVICES Committee considered: HB 39

HOUSE BILL NO. 39 APPROP: FORWARD FUNDING FOR EDUCATION

"An Act making a special appropriation to the forward funding for education account; and providing for an effective date."

RECOMMENDATIONS: [ ] the same title
be replaced with _____ [ ] a new title

[ ] have attached amendments(s)
[ ] do pass
[ ] do not pass
[ ] no recommendations
[X] individual recommendations
[ ] additional referral to the _____ Committee

ADOPTS: _____ letter of Intent

ATTACHES NEW FISCAL NOTE(s): (Dept)
[ ] fiscal impact _____
[ ] zero fiscal note _____

APPROVES PREVIOUS: (Dept/Date)
[ ] fiscal note(s) _____
[ ] zero fiscal note(s) _____

SIGNING DO PASS: SIGNING OTHER RECOMMENDATIONS:

	Check appropriate column:	Do Not Pass	No Rec	Amend
Pat M. Ems				
Chris Davis				
Mary Miller				
Betty J. Dawson				
	John C. Donaldson		X	
	Lorna Anne Smith		✓	
	Mark Blaylock		✓	
	(Amount may need to be adjusted)			

Pat M. Ems

Chairman's Signature

HB

42

Alaska State Legislature

HOUSE OF REPRESENTATIVES

REPRESENTATIVE FRAN ULMER

MEMORANDUM
April 12, 1991

TO: Rep. Georgianna Lincoln, Co-chair
Rep. Pat Carney, Co-chair
House Health, Education and Social Services Committee

FROM: Rep. Fran Ulmer

RE: HB 42, relating to benefits for part-time state employees

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The broad purpose of HB 42, relating to benefits for part-time employees, is to establish a public policy recognizing part-time employment as a valuable and desirable career choice for both the employer and the employee. The bill does this by rectifying several inequities accruing to part-time employment in state service.

It is estimated that women will enter the marketplace in increasing numbers during the next decade, and will constitute the fastest growing sector of the workforce. Single parent families and those families in which both parents must work increasingly face conflicts in which family responsibilities are short-changed. It is to our benefit to create flexible employment opportunities, such as permanent part-time employment, so that individuals are able to meet their financial responsibilities by maintaining employment, and to care for dependent children and elderly or disabled family members as well.

I would like to suggest several changes to HB 42 which I urge you to consider. The original version of HB 42 requires the state to provide the full state contribution rate for health insurance for part-time employees. I would like to suggest the following changes:

(1) Require part-time employees to pay half the premium for health insurance.

Currently, part-time employees have 2 options for health insurance: (1) they may purchase the same group health insurance as full time employees by paying half the premium ($193.16) or (2) they may purchase lesser coverage (which does not include dental, vision, or audio benefits) by paying the full premium ($71.44 /individual and $174.96/family). This change would ensure that part-time employees only pay half the health insurance premium for the policy of their choice.

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(2) Allow part-time employees to achieve permanent status after the same probationary period as full-time employees.

Currently, part-time employees have a probationary period about twice as long as full-time employees. Permanent status is not achieved until the part-time employee has worked the same number of total hours as a full-time employee. This is an unreasonably long probationary period. The 6 month and 12 month probationary periods are adequate to determine the employee's competency on the job.

(3) Allow permanent part-time employees to qualify for salary and leave accrual increases after the same period of time as full-time employees.

Currently, it takes a part-time employee about twice as long to qualify for a pay or leave accrual increase as it does a full-time employee. In order to qualify for these increases, a part part-time employee must work the same number of total hours as the full-time employee. Salary increases and leave increases are intended to reflect job performance and length of service. A part-time employee who has worked continuously for 5 years has demonstrated the same loyalty and length of service as a full-time employee, even though he or she has not worked the same number of total hours.

(4) Allow permanent part-time employees to vest in the Public Employees Retirement System after the same period of time as full-time employees.

Currently, part-time employees become vested in the retirement system based on the proportion of time they are employed. (An employee must work at least 15 hours per week to qualify for vesting as a part-time employee.) For example, an employee working 15 hours per week will be vested in 10 years. An employee working 20 hours per week will become vested in 7.5 years. Requiring vesting to occur as a result of the total number of hours worked by a state employee penalizes those individuals who work part-time, either by choice or necessity, and serves as a disincentive to permanent, part-time employment. Allowing permanent part-time employees to vest in PERS on the same basis as full-time employees (after 5 years) will encourage part-time employment as a viable employment alternative.

The employer will sustain some increased costs associated with these changes. However, those costs will be off-set by long-term savings in child and elder care which may be borne by the family rather than through social services provided by the community.

I have prepared a draft committee substitute incorporating these changes which I urge the committee to consider.

Alaska State Legislature

REPRESENTATIVE FRAN ULMER

MEMORANDUM
5/1/91

TO: Rep. Georgianna Lincoln, Co-chair
Rep. Pat Carney, Co-chair
House Health, Education and Social Services Committee

FROM: Rep. Fran Ulmer

RE: HB 42, relating to benefits for part-time state employees

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As a result of the work of the subcommittee on HB 42, chaired by Rep. Cherie Davis, I have prepared a new committee substitute for HB 42 which incorporates those technical changes that were indicated. Specifically, Section 4 of the bill has been revised in light of the difficulty of requiring the employer to pay half the premium of health insurance purchased through the Supplemental Benefits System. This revision requires the state to offer low-cost health insurance for single member coverage similar to the insurance currently available as "Option 2" from SBS, and that part-time employees shall not pay more than half of the premium for that insurance.

The subcommittee's discussion of the bill raised one primary objection from the administration which points to the policy issue underlying the legislation as a whole. In brief, the administration argues that HB 42 seeks to confer benefits on part-time employees which should be established at the bargaining table. While I agree that employee benefits are an issue for collective bargaining, the benefits addressed by HB 42 have **already** been set by collective bargaining. HB 42 merely seeks to make those benefits available to all employees on an equitable basis.

The attached chart demonstrates the inequity which currently exists between part-time and full-time employees. Over a 4 year period of employment, a part-time employee will receive one-half the pay increase, and one-half the leave accrual increase that a full-time employee will receive. This inequity exists solely because the administration has chosen to establish pay and leave accrual increases on the total number of hours worked, rather than on the length of service. There is no management objective to this policy other than reducing the employee's rate of pay and leave accrual. The result is a serious inequity and disincentive to part-time employment with the state. Since a majority of part-time state employees are traditionally female, this inequity hits hardest at those sectors of the workforce that are the lowest paid.

I urge the committee to support HB 42 and to redress this inequity. In so doing, the state will establish a policy in support of part-time employment as a viable career choice which allows workers to be financially productive and to meet their family responsibilities as well.

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HB 42
Comparison of full-time & part-time employment

	Full-time	Part-time
Year #1	Range 17 (1 employee)	Range 17 (2 employees @half-time)
Year #2	Permanent status 3.5% merit inc	no change no increase
Year #3	3.5% merit inc (7% total increase)	Permanent status 3.5% increase
Year #4	3.5% merit inc (10.5% total increase)	no change
Year #5	3.5% inc (14% total increase)	3.5% increase (7% total increase)