ALASKA LEGISLATURE COMMITTEE FILES 1991-1992 8672
6807 HOUSE HEALTH EDUCATION & SOCIAL SERVICES

ETHOXYQUIN (EQ) SUPPRESSION OF PEROXIDES

The CIVO studies are also seriously compromised by the addition of ethoxyquin (EQ) to the irradiated chicken. CIVO's own data show that EQ decreased the level of lipid peroxides in the irradiated meat to that of the unirradiated controls. Given the fact that organic peroxides are potential radiolytic carcinogens, this is potentially a serious interference with the very phenomenon one is trying to observe. On this basis alone, it is extraordinary that these experiments are even being considered in a matter as important as the potential carcinogenicity of 3% of the diet of the entire US population.

Indeed, the addition of EQ caused all three of the CIVO studies to be excluded from a previous FDA review of the food irradiation literature, even as regards the safety of irradiation at 100 krad, one third the currently proposed dose level. In a memorandum provided by FDA, the rehabilitation of these studies for this, 300 krad, approval, is based upon an assertion that the amount of EQ added was below that observed in other contexts to suppress the development of tumors [Lorentzen, 1985]. This seems a specious argument indeed, given that the amount of EQ added here was enough to reduce the level of potentially carcinogenic lipid peroxides [Hochstein and Atallah, 1988], found to be higher in the irradiated meat, by close to an order of magnitude, down to roughly the same level found in the unirradiated controls. The authors of the memorandum completely fail to note that the level of lipid peroxides in the absence of EQ was consistently higher in the irradiated meat, both before and after storage, and that this difference was suppressed by EQ. Since the nature of radiolytic carcinogens is not known, the authors' statements that such carcinogens must be insensitive to EQ are highly debatable.

While it may be legitimate to mitigate acutely toxic (as opposed to carcinogenic) effects which are artifacts of dose amplification, it is certainly not legitimate to do so by measures which may in any way reduce the differences in the amounts of potential carcinogens in irradiated and control samples. As described above, these experiments are already suffering from severe insensitivity due to statistical considerations alone; to diminish their sensitivity further by artificially eliminating potentially carcinogenic peroxides is adding insult to injury.

ADDITIONAL ISSUES

There are additional concerns regarding all the CIVO studies (storage of the irradiated chicken for periods far in excess of those anticipated for human consumers; possibly excessive supplementation of diets with vitamins A and E) and for the chronic feeding study in particular as noted in memoranda provided by the FDA [Irausquin, 1986] (incomplete histological

examination of animals; lack of clearly stated conditions of irradiation; inconsistent screening methodology). A detailed examination of these problems by our organization was precluded by the short amount of time available since the announcement by the FDA that it was basing its approval primarily, if not entirely, upon the CIVO studies.

COMPLIANCE WITH RECOMMENDATIONS OF THE BFIFC REPORT

The Bureau of Foods Irradiated Foods Committee (BFIFC) Report, issued in 1980, presented a rationale for the approval of major foods irradiated at 100 krad or less, without the necessity of toxicological testing, based upon theoretical considerations of radiolytic chemistry [Brunetti et al., 1980]. The report was cited as the technical basis of the FDA 1986 approval of a wide range of products up to that dose level [FDA, 1986]. This document was again provided by the FDA on the occasion of its present announcement regarding poultry irradiation at 300 krad.

While I have voiced objection to the reasoning of BFIFC as applied to foods irradiated at up to 100 krad [Piccioni, 1988] even BFIFC itself did not consider the reasoning valid for major foods irradiated at higher dose, primarily because the concentration of radiolytic products was anticipated to be too high to dismiss on the basis of indirect data, and theoretical arguments. Indeed, at 300 krad, the concentration of radiolytic products would, by BFIFC's estimates, reach 90 parts per million (i.e., 3.5 grams per person per year, assuming one radiolytic event per 100 eV and an average molecular weight of 300 daltons, and the chicken consumption values used above) [Brunetti et al., 1980]. For doses above 100 krad, BFIFC set forth a decision-making system involving testing both <u>in vitro</u> and <u>in vivo</u>.

It is noteworthy that BFIFC stipulated that the tests <u>in vitro</u> "must be performed on extracts in which the concentration of <u>radiolytic products is maximized</u>." [Emphasis in the original]. The use of concentrated extracts, ideally containing all potential radiolytic carcinogens, is ultimately the only way to substantially exaggerate the dose of such products above that anticipated in the human diet, and thus increase the level of sensitivity of genotoxicity studies to the point that negative results, if they are obtained, provide some assurance of low actual risk.

It is equally noteworthy, however, that BFIFC drops the requirement of the use of concentrated extracts for the <u>in vivo</u> studies, even though the latter are intended to verify possible positive findings <u>in vitro</u>. The justification given was that use of extracted and concentrated material would be "extremely difficult and expensive to effect in the practical sense."

As has been shown above, without extraction and concentration of extracts, dose exaggeration is limited to

roughly the levels attained in the CIVO study (or, perhaps ten-fold higher if 6 megarad irradiated chicken were to be used) and that the resulting minimum detectable risk is two or three orders of magnitude above the standard of acceptable risk. Thus the implication of BFIFC's position is that increasing the effective dose by administration of concentrated extracts is not worth the difficulty and expense involved, even though relying upon whole-irradiated food studies potentially exposes a substantial fraction of the US public to cancer risks on the order of 100 to 1000 per million (Table 3).

The approach adopted by BFIFC represents and questionable balancing of inconvenience and public risk; it bears review by the larger public health community.

CONCLUSION

The lack of adequate statistical power of the chronic feeding study, potential interference in all three studies by the addition of EQ, and other problems noted above, as well as deficiencies in the underlying technical rationale used by the FDA, require that the FDA's approval of poultry irradiation at 300 krad be stayed, pending a proper public hearing of the scientific issues, in which the members of the larger scientific and medical community can participate in this critical question of public health.

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Table I BIOASSAYS ON IRRADIATED ORGANIC MEDIA AND FOODS SHOWING POSITIVE MUTAGENICITY, CHROMOSOMAL DAMAGE, TERATOGENICITY, OR CYTOTOXICITY (page 1)

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 & Ratty	1965	culture medium	mutagenicity	Drosophila
Frey & Pollard	1966	culture medium	mutagenicity	bacteria
Shaw & Hayes	1966	sucrose	chromosomal damage	human lymphocytes
Hills & Berry	1967	glucose	cytotoxcity	mouse fibroblasts
Hollowell & Littlefield	1967	plasma	chromosomal damage	human lymphocytes
Kesavan et al.	1967	sucrose	germination inhibition	pollen
Makinen et al.	1967	pineapple	chromosomal damage	onion roots
Parkash	1967	nucleic acids	mutagenicity	Drosophila
Rinehart & Ratty	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
Meletti et al.	1968	wheat endosperm	mutagenicity	wheat
Ammirato & Steward	1969	sucrose	devel. abnormalities	plant root cells
Chopra	1969	culture medium	mutagenicity	bacteria
Kesavan et al.	1970	sucrose	chromosomal damage	plant cells
Moutschen-Dahmen et al.	1970	laboratory diet	preimplantation death	mouse
Schubert and Sanders	1971	various sugars	cytotoxicity	bacteria
Kopylov et al.	1972	potatoes	mutagenicity of extracts	mouse (sperm cells)
Bhaskaram & Sadasivan	1975	wheat	polyploidy	malnourished childre
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)

author(s)	date	irradiated material	observation	observed in
Vijayalaxmi & Rao	1976	wheat	mutagenicity	rat
Vijayalaxmi & Rao	1976	wheat	sperm count reduction	rat
Aiyar & Subba Rao	1977	various sugars	mutagenicity	bacteria
FAO/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
Wilmer et al.	1980	nucleic acids	mutagenicity	bacteria
Ivanov & Levina	1981	laboratory diet	testicular abnormalities	rat
Wilmer et al.	1981	deoxyribose, ribose	mutagenicity	bacteria
Wilmer & Natarajan	1981	deoxyribose	chromosomal damage	hamster cells
Wilmer & Schubert	1981	nucleosides	mutagenicity	bacteria

Accord Research and Educational Associates
New York, NY (212)580-3889

3/15/89

Table II IDENTIFICATION OF GENOTOXIC RADIOLYTIC PRODUCTS IN IRRADIATED ORGANIC MEDIA OR FOOD
Accord Research and Educational Associates, NYC, 212/580-3889 (1/19/89).

author(s)	date	irradiated material	radiolytic product	genotoxicity
Phillips et al.	1958	dextrose, fructose	glyoxal formaldehyde	mutagenic mutagenic
Kuzin	1963	plant tissues	organic peroxides orthoquinones	mutagenic carcinogenic
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
Berger & Saint-Lebe	1970	starch	formaldehyde	mutagenic
Riov	1971	grapefruit	6,7-dimethoxycoumarin	teratogenic
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
Fiddler et al.	1987	bacon	N-nitrosopyrrolidine	mutagenic

Table 3

Risks which would escape detection in nine out of ten runs of the CIVO chronic feeding study in rats

	Difference of proportions	Excess cases per million	Excess cases per 230 million
All sites	0.037	2,800	655,000
Leukemia only	0.016	1,200	283,000

Difference in proportion is taken from Figures 1 and 2 for all sites combined and leukemias only, respectively. For each, the difference in proportions corresponding to a power of 0.10 is converted to risk to indivduals consuming the average amount of chicken in the US diet, irradiated at 300 krad. This conversion entials correction for the relative percentage of chicken in the US and study diets, as well as an assumed two-fold difference in the dose.

The percent of poultry in the US diet is obtained by updating the USDA value [Brunetti et al., 1980] using a 1989 industry figures on per capital chicken consumption value of 85.6 lbs per year [National Broiler Council, 1989].

The two-fold radiation dose correction is generous to the CIVO study, since in fact only half of the experimental rats were fed chicken irradiated at 600, as opposed to 300, krad.

Figure 1

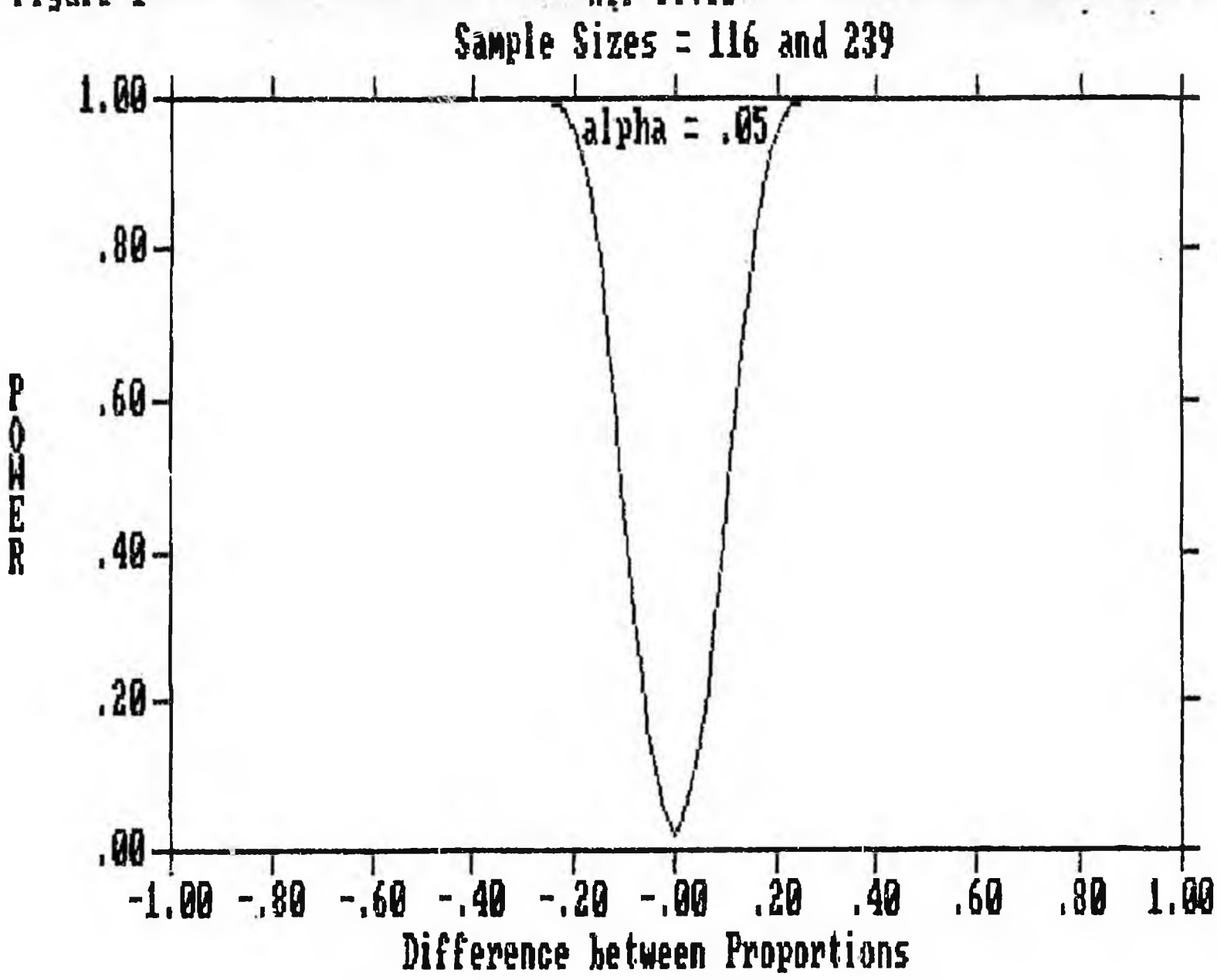
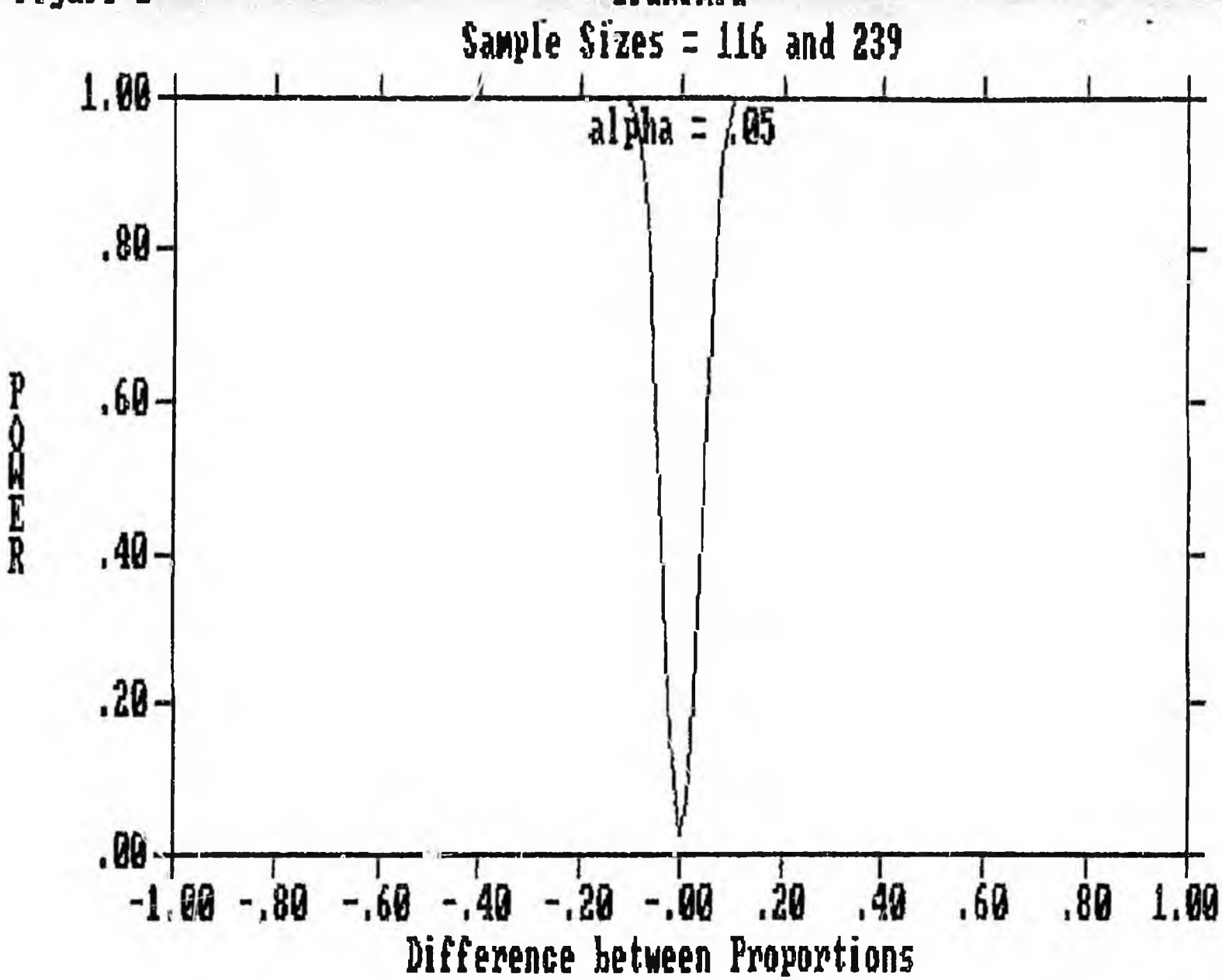

All Sites
Sample Sizes = 116 and 239
alpha = .05
1.00
.80
.60
.40
.20
.00
POWER
-1.00 -.80 -.60 -.40 -.20 -.00 .20 .40 .60 .80 1.00
Difference between Proportions

Figure 2



Alaska State Legislature

Legislative Research Agency

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April 17, 1990

MEMORANDUM

TO: Senator Fred Zharoff

ATTN: Michael Thill

FROM: Leola Weimer
Legislative Analyst

RE: Irradiated Products In Alaska
Research Request 90.295

You asked us to provide information about irradiated food and commercial products sold in Alaska. Specifically, you wanted to know if retailers in Alaska sold irradiated food items (e.g., wheat flour, produce or poultry) or commercial products (e.g., cosmetics and feminine hygiene products). You also asked if hospitals in Alaska provide irradiated food to patients on restricted diets.

SUMMARY

Irradiated food is not commercially available in Alaska. It is estimated that three to ten percent of industrial spices (large quantities of spices sold to manufacturers of processed foods, not including restaurants or retail stores) are irradiated in the United States. In the United States, foods approved for the irradiation process (e.g., pork, fruits, vegetables, wheat and wheat flour) are treated by other means.

Irradiated nonfood products are commercially available in Alaska. Attachment A is a list of commonly irradiated products. Data was not available to determine the market share of these irradiated items.

Thirty to forty percent of all medical products, and over fifty percent of disposable medical products are irradiated. This percentage is expected to increase as the use of ethylene oxide gas decreases.

Alaska hospitals have not prescribed irradiated food for patients on restricted diets. The Fred Hutchen Cancer Center in Seattle, Washington is the only American hospital to have received FDA approval for this practice. The food irradiation program was voluntarily discontinued two years ago.

Currently, the FDA is concentrating its efforts on the approval of irradiated poultry to control *Salmonellae* because there is no known alternative to prevent the spread of this disease.[2] An approval notice is expected to appear in the *Federal Register* before the end of this month.[3]

Since there is no known test to detect foods that have been irradiated, the FDA requires that irradiated foods be labeled with the Radura symbol accompanied with the statement "treated with radiation," or "treated by irradiation."[4] Processed foods with irradiated ingredients (e.g., irradiated spices) are exempted from this labeling requirement because "small quantities are involved, and it is considered obvious that the product has been processed in some way."[5]

The Radura logo is the international symbol adopted by the Codex Alimetarius Commission (the United Nations body that sets international standards to protect consumers, facilitate international trade, and aid developing countries[6]). First used in the Netherlands, this stylized tulip is surrounded by a circle with five breaks depicting rays from the energy source. The predominant color of the logo is green.

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[2]Approvals for the irradiation of poultry to control *Salmonellae* have been granted in Canada (1973), the Netherlands (1971 & 1976) and the Soviet Union (1966), ("Food Irradiation Approaches to Commercialization," *Info Fish Marketing Digest*, no. 1, 1985, p. 33).

[3]Takeguchi, Clyde, Dr., FDA irradiation specialist, telephone conversation, March 13, 1990, Tel: (202) 472-5740.

[4]*Federal Register*, Vol. 51, No. 75, April 18, 1986, Rules and Regulations, P. 13399.

[5]Swanson, Ruthann B., *et al.*, *The Role of Irradiation In Food Processing: Can It Benefit Alaska?* University of Alaska, Fairbanks (UAF), Circular 64, March 1988, p. 4.

[6]Swanson, *Ibid.*, p. 9.

CORRECTION

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BACKGROUND

The irradiation of food is a physical process like canning, freezing, drying and pasteurizing. Food is irradiated to destroy bacteria, yeast and molds; to kill or sterilize insects; or to retard further ripening of fruits and vegetables. Nonfood products may be irradiated for sterilization (e.g., cosmetics, medical supplies and disposable containers) or for strengthening (e.g., car bumpers, rubber tires, wire and cable). The energy source used to irradiate is either from radioactive isotopes such as cesium-137 or cobalt-60, or from machine generators that produce beams of high-energy electrons or X-rays.[1]

Irradiated Food

In the United States, the Food and Drug Administration (FDA) is the agency responsible for premarket safety review and regulation of irradiated foods. Food products must receive approval on a case-by-case basis. The FDA has approved irradiation for the food products in Table 1.

TABLE 1
FOODS APPROVED BY FDA FOR IRRADIATION TREATMENT

Food	Purpose	Dose Limit	Date Approved
Fruits and vegetables	To slow growth and ripening and to control insects	Up to 1 kilogray (kGy)	April 18, 1986
Dry or dehydrated herbs, spices, seeds teas, vegetable seasonings	To kill insects and control microorganisms	Up to 30 kGy	April 18, 1986
Pork	To control *Trichinella spiralis* (the parasite that causes trichinosis)	Minimum 0.3 kGy to Maximum of 1 kGy	July 22, 1985
White potatoes	To inhibit sprout development	50 to 150 gray	August 8, 1964
Wheat, wheat flour	To control insects	200 to 500 gray	August 21, 1963

SOURCE: *FDA Consumer*, July-August 1986, p. 13.

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[1]"Fact Sheet: Irradiated Foods," University of Alaska, Fairbanks (n.d.); and telephone conversation with Jean Swinwood, director of Marketing Development, Nordion International Inc. (Canada), April 12, 1990, Tel: (613) 592-2790.

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[6]Swanson, *Ibid.*, p. 9.

Irradiated Nonfood Products

Commercial nonfood products do not require premarket safety review or labeling. The FDA, Division of Colors and Cosmetics, regulates cosmetic ingredients but does not have any regulations restricting the type of sterilization procedure used in treating cosmetic ingredients. Commercial irradiators must be licensed by the Nuclear Regulatory Commission (NRC) or a state agency authorized to monitor radioactive materials. The Occupational Safety and Health Administration (OSHA) monitors radiation exposure and worker safety. The Department of Transportation (DOT) regulates the transportation of radioactive materials.[7] A list of products commonly irradiated is Attachment A. A comparison of sterilization methods are shown in Attachment B.

OBSTACLES TO FOOD IRRADIATION IN ALASKA

When the FDA approved the irradiation of fruits and vegetables in April 1986, they emphasized that "the marketplace should determine which alternative method is used when safety is not an issue."[8] Confident that food irradiation would soon be a multibillion-dollar industry, the U.S. Department of Health and Human Services (HHS) officials predicted that 10 to 40 percent of our diet would be exposed to irradiation in the near future.[9]

Despite FDA approvals and initial enthusiasm, there are still no commercially irradiated food products available to consumers in Alaska or the rest of the United States.[10] Lack of manufacture application, opposition to food irradiation and consumer ignorance have kept irradiated foods from the market place.

Lack of Manufacturer Application

There are an estimated 37 irradiators in 20 states (not including hospitals and universities) that presently sterilize medical products, cosmetics, pharmaceutical and other devices. Although existing plant facilities are capable of irradiating spices, only a few of the irradiators do so.[11] It is estimated

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[7]Porter, Donna V., Dr., "Preservation of Food By Irradiation," *Congressional Research Service Report For Congress*, 89-491 SPR, Updated August 18, 1989, p. 8-9.

[8]Lecos, Chris W., "The Growing Use of Irradiation to Preserve Food," *FDA Consumer*, July-August 1986, p. 15.

[9]Gibbs, Gary, "Zap, Crackle, Pop, Irradiated Foods Aren't Coming; They're Here," *The Progressive*, September 1987, p. 22.

[10]Porter, *op cit.*, p. 1.

[11]Johnston, Lucy, "Heavens Preserve Us!" *Environmental Action*, May-June, 1987, p. 18.

that three to ten percent of industrial spices (large quantities of spices sold to manufacturers of processed foods, not including restaurants or retail stores) or less than one percent of all spices are irradiated.[12]

Manufacturers have been reluctant to irradiate approved foods because chemical and other alternatives are less expensive.[13] The need to irradiate pork to control *Trichinella spiralis* (the parasite that causes trichinosis) has been replaced by a simple and inexpensive diagnostic test that can be conducted within existing packing plant facilities.[14] The irradiation of spices was approved to help control insects. However, manufacturers commonly use the fumigant ethylene oxide which costs three to four cents per pound instead of irradiation which costs five to six cents per pound.[15] (Ethylene oxide is a known carcinogen capable of causing mutations, damage to developing fetuses and irritation.[16] The EPA is conducting a special review of ethylene oxide to determine its safety and effectiveness.[17]) Fruits and vegetables were approved for irradiation to control insects and slow growth and ripening. Attachment C provides a list of potential applications for fresh fruits and vegetables and the alternatives to irradiation that are currently used. Not all fruits and vegetables, however, are suitable for irradiation. Attachment C also provides a list of common fruits and vegetables and their relative tolerances to irradiation.

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[12]*Ibid.*, p. 17; and telephone conversations with the American Spice Trade Association, Dr. George Giddings of Isomedix, Inc., and Barry Fairand of Radiation Sterilizers, Inc., March 1990.

[13]This is true for all foods currently approved by the FDA for irradiation. FDA approval for the irradiation of poultry to control *Salmonellae* is expected to be announced in the *Federal Register* within the next few weeks (conversations with Hank Kocol, Region Ten, FDA; Dr. Clyde Takeguchi, irradiation specialist FDA; and Dr. George Giddings, Isomedix, Inc.). At present, there is no known alternative for the control of *Salmonellae*.

[14]Giddings, George Dr., radiation processing consultant for Isomedix, Inc., telephone conversation, March 29, 1990, Tel: (201) 887-4700.

[15]Slavin, Joseph, "Food irradiation approaches commercialization," *Info Fish Marketing Digest*, No. 1, 1985, p. 35.

[16]Webb, Tony, Tim Lang and Kathleen Tucker, *Food Irradiation, Who wants it?* 1987, p. 81.

[17]Previously, the fumigant ethylene dibromide was used to control insects. In 1984, the EPA banned the use of ethylene dibromide. A special exception was made for the importation of products treated with ethylene dibromide from certain South Pacific locations where the United States funded the construction of ethylene dibromide facilities prior to the 1984 ban. (Carl Arney, EPA specialist, telephone conversation, April 6, 1990, Tel: (206) 442-2576.)

Another factor contributing to the high cost of irradiation processing is the need to construct additional facilities. Existing irradiators lack the proper storage and processing facilities to irradiate fresh meats, fruits or vegetables.

Opposition to Food Irradiation

The most outspoken opponents to food irradiation in Alaska have been SANE Alaska, Food & Water, Inc. and the Food Irradiation Network (FIN) of Japan. The most common concerns from consumer groups opposed to irradiation are as follows:

1. Safety is not proven because feeding studies are inconclusive, potentially hazardous free radicals are formed, and hazardous microorganisms may have a selective advantage as they are more resistant to irradiation than microorganisms which generate obvious signs of spoilage;

2. Nutrient losses may lower food quality;

3. The Department of Energy is using food irradiation as a way to dispose of cesium-137 waste from nuclear weapons manufacture;

4. Worker safety is not adequately assured;

5. Safeguards for the transport of material to plants is inadequate;

6. People may be unknowingly exposed to irradiated foods since labelling of ingredients in processed foods is not required; and

7. Irradiation will increase the cost of food to the consumer.[18]

Consumer groups opposing food irradiation have had an impact on consumer perceptions towards irradiated foods and manufacturers willingness to use the process of irradiation. Citizens Against Irradiated Food (CAIR) conducted a survey of 44 American food processors in 1986. They found that "the majority of manufacturers do not yet use irradiated foods, and most have taken no position regarding the process."[19] The "crucial issue" in determining whether to use the process of food irradiation was consumer willingness to purchase irradiated foods. A summary of CAIR's findings is Attachment D.

In response to anti-irradiation campaigns, many manufacturers have pledged not to use or process irradiated foods. Quaker Oats, H.J. Heinz, McDonalds, Ralston-Purina, Borden Foods and Beatrice have stated their intention not to use

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[18]Bruhn, C.M. and H.G. Schutz, "Consumer Awareness and Outlook for Acceptance of Food Irradiation," *Food Technology*, July 1989, p. 93.

[19]Webb, *et al.*, *op. cit.*, 1987, p. 122.

irradiated foods. A number of other food processors, retailers and wholesalers have taken similar positions.[20]

Consumer Reaction To Irradiated Food

Studies of consumer reaction to irradiated foods have revealed that consumers are generally unaware of the facts about food irradiation and therefore education programs must be initiated prior to the sale of irradiated foods. M. Young, a consultant for the joint FAO/IAEA marketing committee, found that "a consumer education program is essential." Due to consumer ignorance and association of the word "radiation" with the nuclear industry, consumers' first reaction to irradiated foods is typically "one of horror, revulsion, and disbelief that we could seriously anticipate such a thing."[21] Young recommended careful preparation and consumer education before marketing irradiated foods.

A similar study conducted by Weise Research Associates, Inc., in 1984, found that "in general, consumers fear the unknown, whether the unknown is a 'new' process or what happens during any commercial handling process."[22] Consumer surveys revealed that "a large percentage of the public has not heard of food irradiation and, even if they have heard of the process, they know very little about it."[23]

The findings of these studies is consistent with those of the UAF Institute of Northern Engineering study on food irradiation. In their final report entitled *Alaskan Commodities Irradiation Project*, UAF researchers found that "data from test markets on products of interest in Alaska are essentially nonexistent."

Until manufactures construct new facilities, opposition to irradiation is overcome and/or consumers are educated about the effects of the process, irradiated food will not be commercially available in Alaska.

PRESENCE OF IRRADIATED NONFOOD PRODUCTS IN ALASKA

Commercial and medical products are irradiated for sterilization or strengthening purposes. Because there are no labeling requirements for

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[20]Colby, Michael and Christina Rossler, directors of Food & Water, Inc., letter to Mr. Horgan and Mr. Castner, United Fisherman of Alaska, March 13, 1990, p. 2.

[21]Young, M., Anticipated Consumer Reaction to Irradiated Foods, presentation to FAO/IAEA Consulting Meeting, Vienna, Austria, September 27 - October 1, 1982.

[22]Weise Research Associates, Inc., *Consumer reaction to the irradiation concept--A summary report*, prepared for the DOE and National Pork Producers Council, 1984.

[23]*Ibid.*

irradiated nonfood products, it is difficult to determine which products have been irradiated. Attachment A is a list of nonfood products that are typically irradiated.

Commercial Products

We were unable to determine what percentage of commercial products were actually irradiated. The Department of Commerce does not keep track of such figures, and irradiation facilities and individual manufacturers proved reluctant to disclose such information.

According to Jean Swinwood, marketing director of Nordion International Inc., talc, bentonite[24] and gelatine are the three most common cosmetic ingredients that are irradiated for sterilization. Car bumpers, rubber tires, plastic bags, electrical wires and cable are often irradiated to add strength.

According to Barry Fairand, of Radiation Sterilizers, Inc., feminine hygiene products and other absorbent disposables are often sterilized with irradiation because the alternative, ethylene oxide gas, leaves a toxic residue.[25] Dr. George Giddings of Isomedix, Inc., also explained that many plastic containers and packaged products are irradiated because, unlike the methods of steam or gas, irradiation allows the contents to be sterilized after packaging.[26]

Medical Products

It is estimated that 30 to 40 percent of all medical products, and over 50 percent of disposable medical products are irradiated.[27] The most common alternative to irradiation is ethylene oxide gas. Some reusable medical products (e.g., bed pans and sheets) may be sterilized with heat or steam. The amount of products sterilized by irradiation is expected to increase as more manufacturers seek alternatives to ethylene oxide gas.

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[24]Bentonite is a natural white clay used at a filler in cosmetic products such as eye shadows. Irradiation is the most effective means to sterilize bentonite because its high density makes it impenetrable to steam or ethylene oxide sterilization procedures. (Jean F. Swinwood, marketing director, Nordion International Inc., telephone conversation April 12, 1990, Tel: (613) 592-2790.)

[25]Barry Fairand, Radiation Sterilizers, Inc., telephone conversation, March 30, 1990, Tel: (415) 770-9000.

[26]Giddings, *op cit.*, telephone conversation March 13, 1990.

[27]Telephone conversations with Dr. Fairand, Dr. Giddings, *op cit.*; and Don Price of Sherwood Medical Co., March 29, 1990, TEL: (314) 241-5700.

Irradiated Hospital Food

The prescription of irradiated food for hospital patients with compromised immune systems has been widely used in the United Kingdom since its approval in 1969.[28] In the United States, however, only one hospital has been given a special permit for this purpose. The Fred Hutchen Cancer Center located in Seattle, Washington received FDA approval to supply a diet of irradiated food to cancer patients recovering from bone marrow transplants.[29]

Dr. Sandra Acker, director of the food irradiation program, explained that after receiving a bone marrow transplant, patients must be placed in a completely sterile environment for 30 to 60 days while their body adopts a new immune system. All things, including air, must be filtered or sterilized to prevent infection. Food for these patients must either be canned, steamed or cooked for long periods of time.

During the fifteen years that Dr. Acker administered the food irradiation program, approximately 2,000 patients received irradiated food to supplement their diet. Nearly 25 percent of their diet consisted of pancakes, breads, pastas, dried powders, candy, gum and other food items that had been irradiated at sterilization doses (considerably higher than FDA approvals for commercial food items).

The program was voluntarily discontinued two years ago when the irradiation facility that Dr. Acker was using at the University of Washington was no longer able to irradiate the foods in a timely manner (e.g., one week to sterilize a slice of bread). University and hospital officials determined that it would not be cost effective to rejuvenate the radiation source (cost estimated to be over $250,000). No other hospital has been granted or has applied for FDA approval to irradiate food for patients with low immune systems.

*** ** ***

I hope you find this information useful. If you have further questions, please contact this agency.

Attachments

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[28]Slavin, Joseph W., "Food Irradiation Approaches Commercialization," *Info Fish Marketing Digest*, No. 1, 1985, p. 33.

[29]Acker, Sandra, Dr., Fred Hutchen Cancer Center, telephone conversation April 11, 1990, Tel: (206) 467-5000.

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TELEFAX

TO/A: Leola Weimer
COUNTRY/PAYS: ~~Canada~~ USA
COMPANY/SOCIETE: Legislative Research
FAX: 907-463-3351
CITY/VILLE: Agency - Juno, Alaska
DATE: 17 April /90

Dear Leola;

As discussed, attached is a list of some of the products that are routinely irradiation-sterilized.

Package is on its way. Best regards!

Sincerely,

Jean Swinwood

P.S. Our Food Irradiation expert is Michelle Marcotte, phone # 613-592-2790, fax # 613-592-0440.

FROM/DE: Jean Swinwood
PAGE 1 OF 1
DEPARTMENT: Mkt. Dev.
MY FAX NO: (613) 592-0440

This is not a complete inventory of products, but a reasonably comprehensive list of ex

INFORMATION BULLETIN

ISOMEDIX

ITEMS BEING STERILIZED OR PROCESSED WITH COBALT-60 RADIATION

(some are also being sterilized with electron accelerator machine which are also used for many additional industrial applications

OPERATING ROOM DISPOSABLES

Alcohol Wipes
Arterial Prosthesis
Bandages
Bone Wax
Catheters
Colostomy Pads
Dressing Packs
ECG Electrodes
Fetal Probes
Grounding Pads
Heart Catheters
Hypodermic Needles
Hypodermic Syringes
IV Tubing Sets
Laparodemy Pads
Marking Pens
Orthopedic Implants
(hips, knees, fingers, etc.)
Ostomy Rings
Procedure Packs
Scalpel Blades
Sponges
Stockinettes
Stop Corks
Surgeon Glove Powder
(talc or cornstarch)
Surgeons Gloves
Surgeons Scrub Brushes
(plain and impregnated)
Surgical Drapes
Surgical Gowns
Sutures
Swabs
Towels
Vascular Prosthesis
Water-Filled Syringes

OTHER DISPOSABLES

Bioassay Dishes & Tubes
Bleeder Bags
Blood Bankers
Blood Collection Tubes
Blood Lancets
Body Bags
Bulk Glue
Burn Blankets
Burn Ointments
Burn Pads
Cell Culture Flasks
Centrifuge Tubes
Clean Room Garments
Cornstarch
Cotton Balls
Culture Flasks, Tubes & Trays
Dental Anchors
Dental Burs
Dental Sponges
Drum Liners
Entero Feeding Devices
Eye Droppers
Eye Ointment
Nursing Pads
Petrie Dishes
Pipettes
Polyethylene Bottles
Rawhide Dog Toys
Roller Bottles
Saline Solution
Specimen Containers
Talc
Tampons
Teething Rings
Test Tubes
Thermometer Covers
Thermometers
Tongue Depressors

ISOMEDIX INC.
CORPORATE OFFICES • 11 APOLLO DRIVE WHIPPANY, NEW JERSEY 07981 • (201) 887-4700

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TELEFAX

TO/A: Leola Weimer
COMPANY/SOCIETE: Legislative Research Agency
CITY/VILLE: Juno, Alaska
COUNTRY/PAYS: USA
FAX: 907-463-3351
DATE: 12 April /90

Dear Leola;

As discussed, attached is a list of some of the products that are routinely irradiation-sterilized.

Package is on its way. Best regards!

Sincerely,

Jean Swinwood

P.S. Our Food Irradiation expert is Michelle Marcotte, phone # 613-592-2790, fax # 613-592-0440.

FROM/DE: Jean Swinwood
DEPARTMENT: Mkt. Dev.
PAGE 1 OF 1
MY FAX NO.: (613) 592-0440

CONSUMER PRODUCTS

- Aluminum Hydroxide (antacid)
- Baby Bottle Nipples
- Chlorox Pre-wash
- Cosmetics
  - Bentonite Clay
  - Brushes
  - Cornstarch
  - Emery Boards
  - Eye Lashes
  - Eye Shadow
  - Hair Cream
  - Hair Pieces
  - Karaya Gum
  - Lotions
  - Nut Shells
  - Shampoo
  - Talc
- Cotton Balls
- Cotton-tipped Swabs
- Disposable Nurser Bottles
- Dry Bandages
- Eye Droppers
- Glass Bottles
- Impregnated Bandages
- Infant Wear
- Insect Spray
- Liquid Pre-Wash and Dishwashing Detergents
- Milk Blanks (milk, cream, half & half, egg nog, etc.)
- Moist Wipes
- Pacifiers
- Packaging
  - Bulk Food Containers
  - Butter Pat Containers
  - Creamer Cups & Lids
  - Food/Medical Roll Stock
  - Heat Shrinkable Film
  - Lidding
- Silicone Spray
- Tampons
- Tongue Depressors
- Wine Corks

MISCELLANEOUS

- Bee Hives
- Blood Serum
- Fetal Calf Serum
- Human Bones
- Human Eyes
- Lab Animal Feed and Bedding
- Mastitis Test Kits

NORDION INTERNATIONAL INC.

PRODUCT INFORMATION

Gamma Sterilized Disposable Medical Products and Related Health Care Items

Acupuncture and electrolysis needles

Baby pacifiers, Baby bottles
Baby bottle nipples, Baby powder
Bandages
Beakers, transport containers
Bioassay dishes
Bladder irrigation sets, Blankets
Blood agar (processed in frozen state)
Blood collection tubes
Blood lancets, Blood plasma
Bone joints, hip joints
Bone wax
Bottles and cups
Brushes
Burn ointments, Burn pads

Cataract removal instruments
Catheter collars, Catheters
Centrifuge tubes, Clamps
Connectors eg. T & Y
Contact lens (saline) solution
Culture flasks, tubes
Custom packs and cosmetics

Diagnostic strips
Dialysis units, Dialyzers
Disposable thermometers
Donor sets, Drainage systems
Dressings, Dressing packs

Electrodes, Enzymes
Eye droppers, Eye pads

Filter clamps, Filters
First aid packs, Forceps

Gloving cream
Glove Powder

Hypodermic syringes

Implants, Infusion sets
Inoculating loops and needles
Intravenous bags
Intravenous sets
Iron oxide pigment
IV valves/connectors

Kidney transplantation kits

Laboratory animal bedding
Laboratory animal feed
Laboratory diagnostic kits
Lubricating jelly

Mastitis test kits

Needle counting systems
Neonatal diapers

Oxygenators

Packing film
Petri dishes
Pharmaceuticals
Pipettes

Saline solution
Sanitary napkins
Scalpel blades, Serum tubes
Shampoo, Specimen collection kits
Specimen containers, Stopcocks
Surgeons' gloves
Surgical drapes
Surgical gowns
Surgical kits
Surgical needles, Surgical pens
Surgical scrub brushes, Surgical sets
Surgical marking pens
Surgical staplers
Suture removal tray, Sutures
Swabs, Swab specimen kits
Syringe needles, Syringes

Talc, Tampons
Teflon (to improve properties)
Test tubes, Towels
Tracheal suction kits
Transfusion sets
Transplant carrying containers
Tray kits
Tube connectors, Tubing

Urine bags
Urine sample collection kits

Valves
Vascular grafts

Water

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ATTACHMENT B

Comparison of Sterilization Methods

ISOMEDIX

INFORMATION BULLETIN

COMPARISON OF STERILIZATION METHODS

Consideration	Steam	Ethylene Oxide (toxic and explosive)	Gamma Radiation
1. Product Design	[illegible]aled Cavity	No Sealed Cavity	No Restrictions
2. Materials of Construction	Most Materials Satisfactory except for those which are Heat or Moisture Sensitive	Most Materials Satisfactory	Most Materials Satisfactory
3. Product Packaging	Permeable Material or Second Sealing Process	Permeable Material or Second Sealing Process	No Restrictions
	Provision for Expansion of Packaging during Vacuum	Provision for Expansion of Packaging during Vacuum	No Restrictions
	Seals must withstand Vacuum Stress	Seals must withstand Vacuum Stress	No Restrictions
4. Parameters to be Controlled during Sterilization	Vacuum Pressure Temperature Relative Humidity Time	ETO Concentration Vacuum Pressure Temperature Relative Humidity Time	Time
5. Reliability of Sterilizing Process	Good	Good	Excellent
6. Post Sterilization Microbioloigical Testing	Desirable	Required	Can be Eliminated
7. Quarantine Period	7 – 14 Days	7 – 14 Days	Can be Eliminated
8. Post Sterilization Treatment	Dry Product	Aerate to Remove Toxic Residues	None
9. Quantitative Process Monitoring Possible	No	No	Yes
10. Economics	Good on Low and High Volumes	Good on Low and High Volumes	Good On High Volumes

ATTACHMENT C

Potential Applications for and Alternatives to Irradiation of Fresh Fruit and Vegetables

Common Fruits and Vegetables and Their Relative Tolerances to Irradiation

TABLE 6. A Summary of Potential Applications and Limitations of Ionizing Radiation for Fresh Vegetables, and Fruits,

Commodities	Treatment objective	Estimated minimum dose required (KGy) (1 KGy = 100 Krad)	Estimated maximum dose tolerated (KGy)	Detrimental effects above maximum dose tolerated	Alternative treatment is available
Potato, onion, garlic, carrot, table beet, radish, turnip, Jerusalem artichoke, sweet potato, yam, cassava, taro, ginger	Inhibition of growth (sprouting and rooting)	0.05–0.10	0.15	Decreased wound healing ability Tissue discoloration Increased susceptibility to decay	Use of sprout inhibitors (e.g. maleic hydrazide and chloroisopropyl carbamate) Maintenance of optimum temperature and relative humidity
Asparagus	Inhibition of growth (elongation and curvature)	0.05–0.10	0.15	Tissue breakdown Increased susceptibility to decay	Vertical packing and maintenance of optimum temperature (2°C = 36°F) and relative humidity (95–98%) Use of elevated carbon dioxide atmospheres
Mushrooms	Inhibition of growth (cap opening and stalk elongation)	0.06–0.5	0.50	Development of off-flavors	Prompt cooling and maintenance of optimum temperature (0°C = 32°F) and relative humidity (95–98%)
Artichoke, asparagus, broccoli, brussel sprouts, cabbage, cauliflower, lettuce, spinach, other leafy vegetables	Insect disinfestation (prevention of adult emergence)	0.15–0.30	0.25	Loss of green color Stem pitting of artichoke Tissue discoloration	Fumigation with hydrogen cyanide (can be detrimental to quality of most commodities in this group)
Snap beans, sweet corn cucumber, eggplant, okra, green peas, bell peppers, summer squash	Insect disinfestation	0.15–0.50	0.50	Loss of green color Increased denting of sweet corn Tissue discoloration	Fumigation with methyl bromide (can be detrimental to quality)
Cantaloupe, honeydew melons, persian melons, casaba melons, tomatoes	Insect disinfestation	0.15–0.30	1.00	Accelerated softening Abnormal ripening	Fumigation with methyl bromide (can be detrimental) Short vapor heat treatment
Apple, apricot, blueberry, cherry, fig, loquat, nectarine, peach, pear, persimmon, plum, pomegranate, raspberry, strawberry, tamarillo	Insect disinfestation	0.15–0.30 depending on the commodity	0.50–1.75	Accelerated softening Abnormal ripening	Fumigation with methyl bromide (can be detrimental) Cold treatments
	Control of postharvest diseases	1.50–2.00			Use of postharvest fungicides
Avocado, grapefruit, grade kiwifruit, kumquat, lemon, lime, olive, orange tangelo, tangerine	Insect disinfestation	0.15–0.30	0.25–0.75 depending on the commodity	Accelerated softening Tissue discoloration Surface pitting	Cold treatments (can be detrimental)
Banana, mango, papaya, pineapple, plantain, guava, lychee, longan, rambutan, cherimoya, carambola, passion fruit, sapodilla	Insect disinfestation	0.15–0.30	0.50–1.50 depending on the commodity	Accelerated softening Uneven ripening Tissue discoloration	Hot water or vapor heat treatments Fumigation with methyl bromide (can be detrimental)
	Retardation of ripening	0.25–0.50			Temperature management Ethylene removal Controlled atmospheres

Source: Food Irradiation for the Produce Industry, United Fresh Fruit and Vegetable Association, 1986.

TABLE 5. Relative Tolerance of Fresh Fruits and Fruit-Vegetables to Irradiation Stress at Doses Below 1 kGy (100 krad)

Group A	Group B	Group C	Group D
Apple	Apricot	Avocado	Kiwifruit
Cherry	Banana	Cucumber	Persimmon
Date	Cherimoya	Grape	Pomegranate
Guava	Fig	Green bean	
Mango	Grapefruit	Lemon	
Muskmelons	Kumquat	Lime	
Cantaloupe	Litchi	Olive	
Honeydew	Loquat	Pepper, bell	
Nectarine	Orange	Pepper, chili	
Papaya	Pear	Summer Squash	
Peach	Pineapple	Tree nuts	
Prune and other	Plum	Almond	
dried fruits	Tangelo	Filbert	
Raspberry	Tangerine	Pecan	
Strawberry		Pistachio	
Tomato		Walnut	

Group A. Commodities with minimum documented detrimental responses to irradiation.

Group B. Commodities with inconsistent documented detrimental responses to irradiation.

Group C. Commodities exhibiting significant, documented irradiation injury.

Group D. Commodities for which no documentation of radiation tolerance is available.

Source: U.S. Dept. of Energy, Agriculture, and the American Institute of Biological Sciences. Low-Dose Radiation Treatment of Agricultural Commodities. Working Report of Workshop, Arlington, VA., Apr. 19-21, 1982.

ATTACHMENT D

Citizens Against Irradiated Food (CAIR)
1986 Survey Response

CRS Report for Congress

Preservation of Food By Irradiation

Donna V. Porter
Specialist in Life Sciences
Science Policy Research Division

Updated August 18, 1989

CRS

Congressional Research Service • The Library of Congress

APPENDIX 3

RESPONSE TO U.S. SURVEY

Manufacturer	Irradiating	Irradiated Ingredients	Conducts Research	Concept
Armour-Dial Corp.	No	No	No	No
Beatrice-Hunt/ Wesson	No	Yes-Spices	Interested in	technology
Best Foods (Hellman's, Mazola Skippy)	No	No	No	DNA
Bordens	No	No	No	No
Campbell's Soup Company	No	DNA	DNA	Yes-Coalition
Carnation	No	No	Yes	believes promising
Celestial Seasonings	DNA	No	DNA	DNA
Chelsea Milling Co. (Jiffy Mixes)	No	No	No	No
Compass Foods (8 o'clock bean coffee)		No	No	No
Dannon Company, Inc.	DNA	No	DNA	DNA
Fearn Natural Foods	No	No	No	No
R.T. French Co. (French's)	DNA	No	Irradiation has potential	
Gorton's Fish	No	No	No plans to irr. in future	
Hartville Kitchen (salad dressings)	DNA	No	DNA	DNA
Heinz	No	DNA	Yes	DNA
Hollywood Foods	No	No	DNA	DNA
Holsum Foods	No	DNA	No	thinks safe
Hormel	No	No	DNA	DNA
I&K Dist., Inc.	No	No	No	No
Lawsons Company (dairy products)	No	No	DNA	DNA
The Larsen Company (Freshlike Veg.)	No	No	Evaluating concept	
Thomas J. Lipton, Inc.	No	DNA	No	Yes-Coalition
Miami Margarine Co.	No	No	No	DNA

Manufacturer	Irradiating	Irradiated Ingredients	Conducts Research	Concept
Miss Molly Foods (TV dinners)	No	No	DNA	DNA
Nature's Plus (vitamins)	No	No	No	No
Nature's Way (herbal powders)	No	No	DNA	DNA
Nestle Foods	No	No	No position	No position
Ocean Spray Cranberries, Inc.	No	No	No	No position
Oscar-Mayer	No	No	DNA	DNA
Ralston-Purina (human and pet foods)	No	No	No	Believes safe
J.H. Routh Packaging (pork products)	No	No	DNA	DNA
Swift-Eckrich	DNA	DNA	Are evaluating concept	
Starkist Foods, Inc. (human and pet foods)	No	No	DNA	DNA
Sunny Delight Juices	No	No	No	DNA
Weaver Foods	No	No	No	DNA
SPICES:				
Durkee Famous Foods	No	-	-	-
Kroger	No	-	-	-
McCormick	not retail	-	Yes	-
Mrs. Dash (Alberto-Culver)	No	DNA	DNA	DNA
Topco (Food Club Spices)	No	-	-	-
Ragu products do not contain irradiated herbs or spices.				
BABY FOOD:				
Beech-Nut	No	No	No	No
Gerber	No	No	Yes	-
Heinz	No	-	-	-

DNA, did not answer.
From C.A.I.R. Newsletter, December 1986.

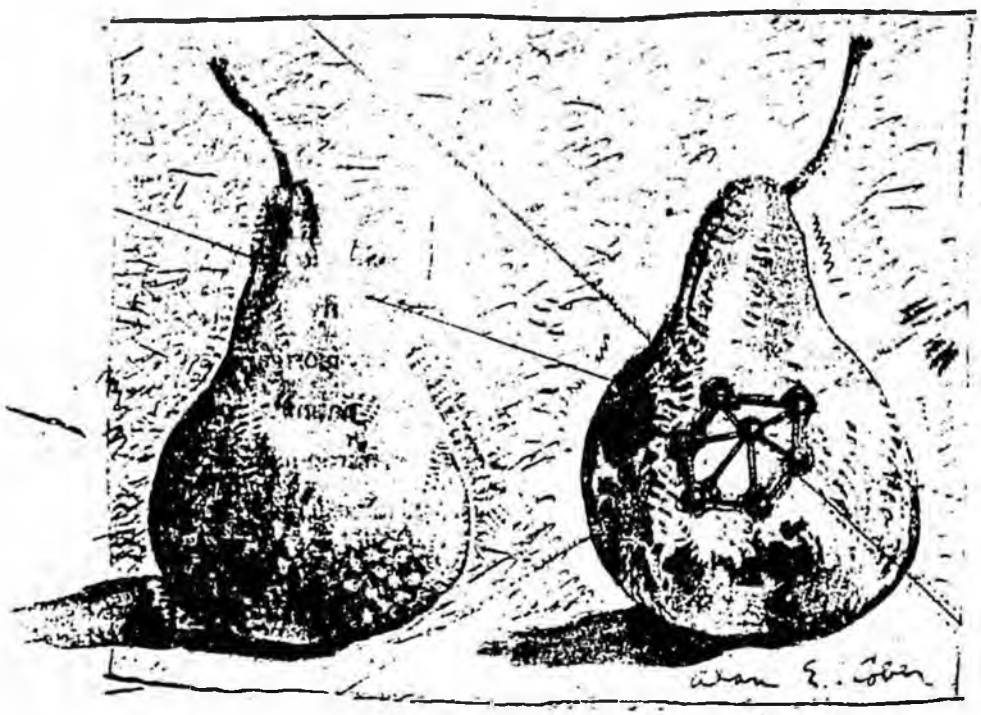
FOOD IRRADIATION

WHO WANTS IT?

Tony Webb, Tim Lang, and Kathleen Tucker

With a forward by Michael Jacobson, Director
Center for Science in the Public Interest

Thorsons Publishers, Inc.
Rochester, Vermont
Wellingborough, Northamptonshire



PUBLIC HEALTH

Food Irradiation

Emotional opposition persists in the face of scientific evidence that the process is harmless

When the Food and Drug Administration announced, last May, its approval of irradiation to kill salmonella and other harmful bacteria in poultry, the only uncertainty about the poultry industry's response lay in what reason it would provide for declining the FDA's invitation to use the process. The rationale that industry spokesmen gave—citing food irradiation's poor public image rather than concerns about its safety—accurately reflects the degree of public confusion about the process. In declining to impugn food irradiation's wholesomeness, the spokesmen concurred with the widespread assumption among scientists that the process is safe. They were also correct in acknowledging that most laymen would rather depend on proper cooking to kill salmonella than eat irradiated poultry. "The issue," said Roger Coleman, of the National Food Processors Association, "is consumer acceptance."

Food irradiation works by exposing food to beams or isotopes of ionizing energy, which split molecules of organisms within the food that cause disease, spoilage, or other forms of deterioration. If enough molecules are split, the organisms die. Meanwhile, the energy passes through the food, leaving it otherwise relatively unchanged. Food-irradiation advocates cite substantial evidence that low doses of radiation can destroy the salmonella bacteria that infest up to half the poultry now marketed in the United States, kill trichina in pork, wipe out harmful insects and microorganisms that infest some fruits and vegetables, kill parasites in fish, inhibit sprouting in potatoes and onions, and delay spoilage in a variety of foods, all while affecting taste and nutritional content only slightly. The advocates say that at higher radiation exposures—above the level currently approved by the FDA—food can be sterilized (for consumption, say, by hospital patients whose immune systems have been seriously damaged) and it can be given a nearly indefinite shelf life without refrigeration. In some instances irradiation could replace toxic pesticides. For example, the Hawaiian papaya industry, which slumped after the Environmental Protection Agency banned a chemical defumigant called ethylene dibromide, used in fruit-fly disinfestation, actively backed irradiation as an alternative. Irradiation's most ardent supporters even maintain that the process could combat hunger in Third World countries, by reducing food losses due to spoilage. While that may be claiming too much, thirty-seven nations, including such poor countries as China and Bangladesh, have approved the process, and of those, twenty-four are using it.

Most opposition to food irradiation is visceral. It starts from the assumption that radiation, frequently a lethal agent, cannot possibly affect food in safe ways. Considering that radiation is linked to such symbolic and literal disasters as Hiroshima, Three Mile Island, and Chernobyl, the power of that assumption is undeniable, even if food irradiation has nothing but radioactivity in common with atomic bombs and nuclear reactors. Fear of radiation has provoked a segment of the public to resist the process, and the dispute thus chiefly pits experts who support food irradiation against laymen who oppose it. Instead of grappling with the details of scientific inquiry, the coalition of anti-nuclear activists, organic-food advocates, and holistic-health practitioners who compose the organized opposition to food irradiation habitually make startling but invariably hollow claims of conspiracy. For instance, Denis Mosgofian, the former director of the San Francisco-based National Coalition to Stop Food Irradiation, charged in 1987 that during her two-and-a-half-year tenure as Secretary of Health and Human Services, Margaret Heckler, a longtime food-irradiation advocate, "headed up the entire process of getting food irradiation through FDA." That unsubstantiated allegation, with its implication that Heckler influenced the FDA's decision-making process, overlooks the facts that the report establishing the FDA's pro-irradiation policy was written nearly three years before Heckler became Secretary, and that the FDA's final rule on fruits and vegetables—the agency's most significant food-irradiation rule of the 1980s—was announced after her departure.

Opponents have also resorted to colorful antics to draw attention to their cause. In 1987, when a Canadian parliamentary committee was considering the future of food irradiation, a man wearing a chicken suit strolled through downtown Toronto handing out anti-irradiation leaflets. In October of that year, when a proponent tried to display

ILLUSTRATION BY ALAN E. COBER

canned irradiated chicken to television cameras during a food-irradiation debate in Washington, D.C., an opponent slipped a drawing of a skull and crossbones onto the table. But while such ploys reflect the opponents' flair for public relations, they shed little light on a process that may possess considerable benefit for mankind.

OF THE HUNDREDS of scientists in this country who have done extensive research on the wholesomeness of food irradiation, only a few have publicly expressed opposition to it, and the several other scientists who are actively against food irradiation are not experienced in the field. This consensus almost certainly exists because the preponderance of evidence refutes the opposition's claims. Not even the most ardent food-irradiation opponent argues that the process makes food radioactive, but, as radiation chemistry has shown, irradiation does create tiny numbers of molecules known as radiolytic products—formed when the ionizing energy from a radioactive isotope or a linear accelerator splits food molecules, creating new ones. The argument over food irradiation's wholesomeness essentially turns on whether these radiolytic products, or RPs, are hazardous when eaten.

In defending food irradiation's safety, an FDA committee in 1980 cited data showing that a low radiation dose would generate RPs in a ratio of no more than thirty parts per million. Of those thirty parts, about 90 percent have been identified as identical to natural food components and therefore presumably safe. Of the remaining 10 percent of the RPs—or three parts per million—most have been found to be chemically similar to natural food components. Their understanding of the composition of equivalent natural food led the researchers to conclude that if the remaining RPs harbored any significantly toxic substances, these existed in quantities so small—a few parts per billion—as to be harmless. Such levels, they said, were undetectable in state-of-the-art toxicological tests. In addition, FDA officials now maintain, they are comparable to the quantity of significantly toxic substances known to exist, harmlessly, in some nonirradiated foods. The FDA officials assert that only one significantly toxic RP, benzene, has ever been identified, and that was in meat irradiated at a dose more than fifteen times as great as that now approved by the FDA. According to George H. Pauli, an FDA consumer-safety officer who has supervised the agency's food-irradiation deliberations, the amount of benzene in the irradiated meat was 100 times less than that found in nonirradiated eggs.

Both sides cite various toxicological tests to support their conclusions, but all such tests have limited usefulness when applied to food irradiation. A standard toxicological evaluation of a food additive entails supplementing test animals' diets with the additive in quantities far greater than those to be used in practice, to find the maximum quantity that produces no ill effects; that quantity is then divided by a safety factor, usually 100, to determine the amount of the additive allowable in human diets. But with food irradiation the "additive" is the food itself, and no animal would be able to eat the quantity of irradiated food required to find the no-effect level. Or, if the animal were fed one kind of irradiated food out of proportion to its normal intake of that food, the study might produce ill effects caused not by irradiation but by the test diet's nutritional imbalance. Scientists have tried to get around these limitations by defining the additive as RPs, which are, after all, what distinguishes irradiated food, but this approach also has drawbacks: RPs exist in such low concentrations that the needed excess cannot be supplied, and in any event many RPs have not even been identified. For all these reasons toxicological testing can do no more than provide rough indicators of irradiated food's safety.

Even so, opponents claim to have found a smoking gun in a set of studies conducted by the National Institute of Nutrition in Hyderabad, India, in the early 1970s. Referring to evidence that malnutrition could increase one's vulnerability to the toxicity of drugs, scientists at NIN devised a study to test the effect of irradiated food on severely underfed children. Three groups of five children, all two- to five-year-olds suffering from a disease of malnutrition called kwashiorkor, were hospitalized and rehabilitated. One group was fed freshly irradiated wheat, one received wheat irradiated and then stored for twelve weeks, and one got nonirradiated wheat. The study's authors stated that four of the five children in the first group developed polyploidy, a chromosomal abnormality that may cause cancer, while children in the second group displayed far fewer polyploid cells, and children in the third group showed none. The authors concluded, "These observations clearly indicate that the appearance of polyploid cells is due to the feeding of irradiated wheat." They recommended storage of irradiated wheat "for periods beyond twelve weeks, before it can be considered safe for human consumption." Other NIN studies showed polyploidy or lethal mutations in animals fed irradiated wheat.

However, the studies' conclusions conflicted with the findings of similar experiments on rats and mice conducted at the Bhabha Atomic Research Center, in Bombay, and so the Indian Ministry of Health asked two independent scientists to identify reasons for the discrepancy. After examining the two sets of studies, the scientists harshly criticized the NIN studies. The number of polyploid cells found in the children fed freshly irradiated wheat "is well within the normal range of occurrence in healthy human beings," they said, whereas the number of polyploid cells found before the studies began—none—contradicted the conventional understanding that all human beings have some polyploid cells. The scientists also questioned the studies' claim that in the two children who were examined after they had stopped eating the irradiated wheat, all abnormal cells disappeared within twenty-four weeks. Such cells, the scientists said, should continue to exist for years. These and other problems led the scientists to conclude that "the bulk of the NIN data are not only mutually contradictory but also are at variance with the well established facts of biology."

The scientists' critique led the Indian government unconditionally to accept irradiated-wheat products. And other food-policy-making agencies around the world, including the FDA, dismissed the NIN studies as a product of bad science. Michael G. Simic, a research chemist at the National Institute of Standards and Technology's Center for Radiation Research and a professed independent in the food-irradiation controversy, speaks for most scientists who have worked in the field when he calls the NIN studies "discredited."

Opponents of irradiation usually respond that those who disparage the NIN studies have an overriding interest in promoting food irradiation.

Opponents also charge that processing plants using isotopes as radiation sources pose unacceptable health risks to nearby residents. Exposure to the isotopes used in irradiation can indeed be lethal. For that reason each plant's isotopes, customarily sheathed in stainless-steel capsules, are stored in a cell surrounded by cement walls five or six feet thick, which absorb radioactive energy. Products needing exposure are rolled into the cell on a conveyer belt. Workers enter the cell only when the plant is not in operation and the isotopes have been mechanically lowered into a pool of water inside the cell.

Food-irradiation opponents say that the safety record of the roughly forty American irradiation plants makes a "hall of shame," and an information manual published by the National Coalition to Stop Food Irradiation (NCSFI) cites six accidents as evidence. However, none of the accidents is known to have caused harm to anyone outside the plant. In addition, although four of the incidents involved leaks of isotopes into the shielding pools, in each case the leaking capsules had been built using a technology no longer in use (although some of the old-style capsules are still in use). The leading current supplier of capsules, Nordion International, formerly a subsidiary of Atomic Energy of Canada, has built 25,000 capsules and delivered them around the world without experiencing a single leak.

Furthermore, if the fondest dreams of some proponents are realized, the dangers posed by isotopes will be eliminated. These proponents envision a time when linear accelerators will replace isotopes as energy sources for food irradiation; indeed, accelerators have already supplanted isotopes as sources for medical therapy units, and are used commercially in many other kinds of radiation processing. Instead of emitting radiation in all directions, accelerators generate high-intensity beams of radiation that can be as narrow as half an inch in diameter. Moreover, a flip of a switch starts or stops generation of the beam. That means that so long as accelerators are not running, they present no danger; the difficulties of transporting, storing, and using isotopes are obviated. Cost is the biggest obstacle to expanding the use of accelerators, but recent technological advances may eventually make accelerators as cost-effective as isotopes.

THE MOST SPECTACULAR charge by critics of irradiation, recently weakened by the improvement in Soviet-American relations, is that the U.S. Department of Energy has promoted food irradiation as part of a convoluted strategy to increase the production of plutonium, thereby furthering weapons production. Mosgofian, the NCSFI's former director, went so far as to call food irradiation "the engine to drive a crucial component of the arms race." Opponents cite the DOE's role as administrator of a program, launched in 1985, to build six demonstration irradiation plants, at a

cost of about $32 million. Whereas most irradiation plants around the world use cobalt-60, supplied by Nordion International, as their isotope source, government planners originally hoped to use cesium-137 in the demonstration plants. Unlike cobalt-60, cesium-137 is an incidental by-product of nuclear-weapons manufacture; it is also more dangerous and less suitable for irradiation than cobalt-60.

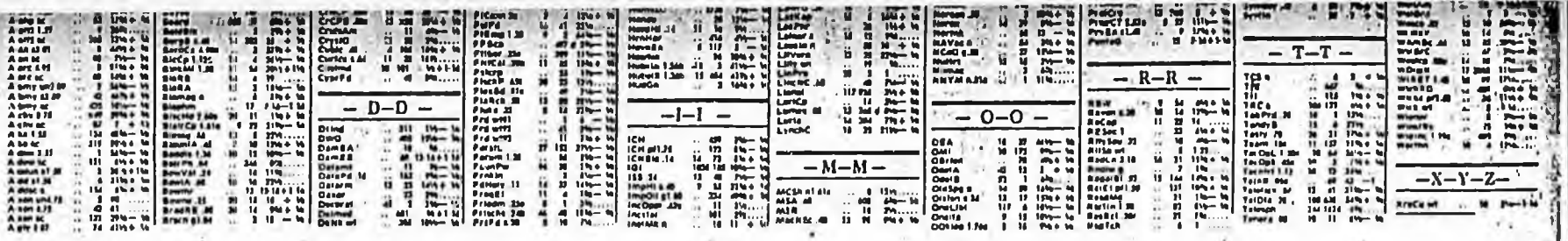
One reason the planners were in favor of cesium is that they wished to put to use the relatively small amount that had been kept in underwater cooling tanks at Washington State's Hanford Nuclear Reservation while awaiting storage in a permanent geological repository. But opponents suspected an ulterior motive: if the demonstration plants showed that cesium was useful in food irradiation, private plant operators might demand access to another, much larger source of cesium—the spent fuel from commercial nuclear reactors. Spent fuel also contains an abundant amount of plutonium; reprocessing of the fuel, which would be necessary to extract the cesium, would be the first step toward recovering the plutonium for military use. A 1986 NCSFI publication states, "The separation processing of cesium will allow for the reprocessing of plutonium for the new generation of 17,000 warheads the Reagan Administration has requested within the next 6-7 years."

Advocates point out that the 1982 Hart-Simpson amendment to the Nuclear Regulatory Commission's budget authorization bars using spent commercial fuel for military purposes, and that the DOE has shown no interest in repealing the amendment. The requisite reprocessing plants do not even exist in this country, and are not likely to for many years, if ever. In addition, the impetus for the six demonstration irradiation plants came not from the DOE, which was lukewarm toward the idea, but from Congress, where irradiation advocates regularly wrote money for the program into administration budgets. Finally, none of the planned demonstration plants specified any intention to use cesium as an energy source, and after funding constraints caused the program to be cut back, the two plants that survived chose a source other than cesium. This seems a peculiar way to operate a program intended to create a demand for cesium. Although the cesium argument is without merit, it has nonetheless complicated the proponents' public-relations chore. George Giddings, an irradiation-technology consultant, correctly calls the argument "the single most inflammatory aspect of the food irradiation debate." He says, "It has fueled the controversy far beyond its significance."

The two sides are now at an impasse. On the one hand, advocates have held sway at the federal level, as the FDA's poultry rule indicates. Legislation introduced in Congress three years ago to roll back FDA food-irradiation permits and ban the import and export of irradiated food for two years never reached the floor, and enactment in the future is extremely unlikely. On the other hand, opponents have had some triumphs at the state and local levels. They have won two-year moratoriums on sales and processing of irradiated foods in New York and New Jersey, and they have obtained a permanent ban in Maine. Before the DOE's food-irradiation program was cut from six to two plants, they also blocked construction of two of the proposed facilities, first in California and later in Alaska, and they have prevented private irradiation companies from building plants in several cities. Most important, the opponents' success in depicting food irradiation as dangerous is likely to deter food companies for at least the next several years from the risk of alienating consumers by embracing the process.

Even without the pressure from opponents, food irradiation's development would probably be slow, because of uncertainties about the efficiency of the process. DOE planners hope that their demonstration plants, both of which will use accelerators as energy sources, will resolve some of those questions. In the meantime, food-company executives seem prepared to wait. Merle Eiss, the technical-systems manager at McCormick & Company, the only food manufacturer in the country that has acknowledged using food irradiation even sparingly, says, "Consumers react very slowly to any technological change [related to food]. People thought canned food was poison, and fifty years passed before anybody would eat it. Some people around the country still don't like to drink pasteurized milk."

—Jacques Leslie



White House would not fight resignation of S&L bailout boss

By DAVE SKIDMORE
The Associated Press

WASHINGTON — The White House said Tuesday it would not resist the resignation of savings and loan bailout boss L. William Seidman, raising strong protests from the regulator's supporters in Congress.

Seidman, 69, is chairman of the Federal Deposit Insurance Corp., which guarantees bank and S&L deposits, and of the Resolution Trust Corp., the agency charged with disposing of failed thrifts.

He was appointed by President Reagan in 1985. His term expires in October 1991.

Presidential spokesman Marlin Fitzwater said, "Bill has indicated he's not going to stay the whole term, and we are interested in getting new leadership there that would carry on an aggressive program when the time comes."

However, Fitzwater denied a report in The Washington Post that Bush suggested in a meeting with the regulator two weeks ago that this would be a good time for Seidman to leave. The newspaper quoted two unidentified administration sources.

"The president has not asked him to leave or suggested a specific departure," the spokesman said.

Seidman has made no secret of his desire to leave before the end of his term. Despite periodic feuding with White House Chief of Staff John Sununu and Deputy Treasury Secretary John Robson, however, he had given no indication his departure was imminent.

Although he has riled administrations with his willingness to hold an independent line, Seidman gets high marks on Capitol Hill for steering the FDIC through the unprecedented failure of more than 800 banks during his term and for his candor about the thrift industry's problems.

In a letter circulated by Rep. Charles Schumer, D-N.Y. and a member of the Banking Committee, House Democrats called on Bush to urge Seidman to stay and warned that his departure would paralyze the administration's bailout effort.

"It is intolerable that Chairman Seidman's early departure may be the result of his frustration with the internal bickering, bureaucratic interference, and turf battles that have marked the first nine months of the thrift bailout effort," the letter read.

Sen. Donald W. Riegle Jr., chairman of the Senate Banking Committee, said, "It's my hope that Bill Seidman will remain at the FDIC and finish his term. It's a crucial assignment and Bill has the experience and independence the country needs at this time."

Seidman, reached by telephone from his hometown of Grand Rapids, Mich., where he was accepting a business award, declined to comment on the story.


L. William Seidman

ADN
5/2/90

Government approves use of radiation to control bacteria on poultry

May 1, 1990

By DEBORAH MESCE
The Associated Press

WASHINGTON — The Food and Drug Administration on Tuesday approved irradiation of poultry to control salmonella and other bacteria that cause food-borne illnesses. But the industry said it had no plans to use the procedure.

The FDA said irradiation is safe and effective in eliminating most bacteria in chicken, turkey and other fresh and frozen birds, making poultry safe for longer periods under refrigeration.

Poultry companies, however, said they do not plan to use the technology because of consumer opposition and because "the consumer can achieve the same thing by cooking the chicken," said Stephen Pretanik, science director at the National Broiler Council, which represents the commercial broiler chicken industry.

"There does not appear to be wide consumer acceptance for any food irradiation," he said.

Although cooking chicken thoroughly kills illness-causing bacteria, "a lot of the sickness coming from chicken is coming from cross-contamination" when raw poultry comes in contact with other food, said George Pauli, consumer safety officer at FDA.

Irradiation of food was first approved in 1963, when the FDA allowed its use to control insects in wheat and wheat flour. Later, the FDA approved its use to control insects, spoilage and parasites in other grains, fruits, vegetables, spices and pork.

Irradiation of poultry is the first approved use aimed at controlling bacteria in food that cause illness in humans.

So far, the process has been used infrequently because of consumer opposition, food industry officials said. When foods are irradiated, they must be labeled that have been treated that way.

The FDA on Tuesday emphasized that "the process does not make the food radioactive and, as a result, does not expose consumers to radiation."

But Michael Colby, director of Food and Water Inc., a grou that researches food safety and environmental issues, said the FDA's action was "an outrage to consumers and to anyone who cares about safe food products."

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WHOLESOMENESS OF IRRADIATED FOODS

by

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Irradiated foods. Are they safe or not? Some Alaskans have expressed concern about the possibility of induced radioactivity, toxicological effects, and changes in nutritional quality.

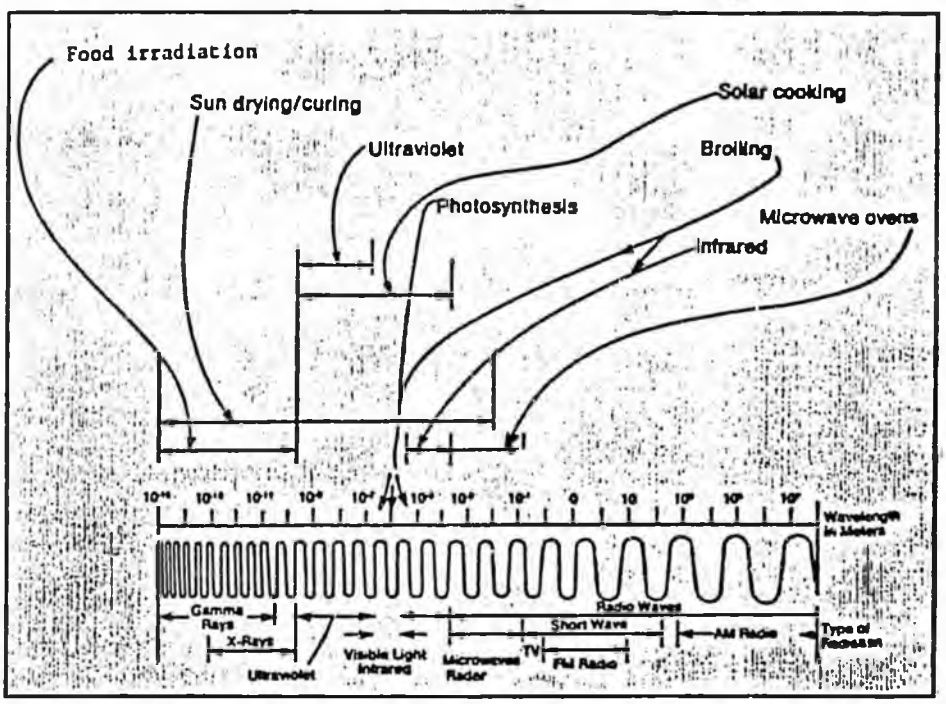
Irradiated foods are considered safe if no significant toxic effects or radioactivity are produced by processing, nutritional quality is not significantly decreased when the food is compared to fresh product or the same product processed using traditional methods, and harmful microorganisms and microbial toxins are not present.

Electromagnetic Energy and the Irradiation Process

Irradiated food products are exposed to an ionizing radiation source for a short time. Ionizing radiation (gamma rays, X-rays, and high-energy electrons) is just one form of electromagnetic energy. Other common forms of energy, such as infrared, microwave, and ultraviolet radiations, are also part of the electromagnetic spectrum (see figure).

If you have consumed an apple or some other food that has passed through an airport security station, you have consumed a food exposed to ionizing radiation. Sun-dried foods also have been exposed to ionizing as well as infrared and microwave irradiation (see figure). Just as these foods are not radioactive, neither are irradiated foods.

Irradiation extends the refrigerated shelf life of fishery products by reducing levels of spoilage microorganisms present. Irradiation also reduces pathogenic microorganisms that may cause illness. Because the temperature of the product is increased only a few degrees, the appearance, flavor, and texture of the fresh unprocessed product are retained. At the low-dose levels suggested for commercial application, the foods are not sterilized. Irradiation at suggested commercial levels reduces the initial microbial load, but it does not totally eliminate it (Giddings, 1984).



Food processing and cooking using electromagnetic energy.

Microbiological Safety

A major concern regarding the use of irradiation on seafood products is the selective killing of spoilage bacteria while dangerous toxin-producing bacteria survive. *Pseudomonas*, the most common spoilage bacterium, is easily killed by irradiation. However, *Clostridium botulinum*, the bacterium responsible for botulism, is not. Because botulinum bacteria do not produce putrid odors in foods, consumers must rely on spoilage bacteria to indicate the fishery product is unsafe. This potential risk is of particular importance in Alaska. Handling and processing techniques used for fish harvested in Alaskan waters must assume contamination because botulinum type E is widely distributed in our waters.

Although spoilage bacteria, e.g., *Achromobacter*, *Micrococus*, and *Pseudomonas*, are reduced during irradiation, spoilage does occur prior to production of the deadly botulinum toxin. Botulinum spores are injured at the low temperatures suggested for irradiation processing and these are less likely to germinate and produce toxin than are uninjured spores (Rowley *et al.*, 1983).

Radiolytic Products and Toxicological Safety

Fewer chemical changes occur during the irradiation process than during more traditional processing or simply during cooking. No more than a few chemical bonds per million may be broken. This breakage causes free radicals to form just as they are formed during the baking of bread. The free radicals quickly combine with themselves or with other food components to form stable compounds in the presence of moisture. The compounds formed during the irradiation process are called radiolytic products. Despite

the special name, almost all have been identified in the same or other foods that have not been irradiated.

Opponents of food irradiation contend that there is the possibility that radiolytic products are mutagenic (alter the genes or chromosomes) or carcinogenic (cause cancer) and that only "one single carcinogenic insult is needed to produce a malignant tumor" (NCSFI, n.d.). Advocates dispute this view, listing mutagens and carcinogens already consumed by Americans, including those in fresh, nonprocessed foods.

In a classic study (Hall, 1977), natural ingredients of foods served at a multicourse luncheon were tested for toxicity using the same criteria used for man-made substances. From a menu including carrots, radishes, onions, olives, ham, shrimp Newburg, potatoes, broccoli, watercress, parsley, rolls, avocado, cheese, bananas, milk, wine, tea, coffee, and water, only a hearts of palm salad was without adverse health effects! Although potential mutagens and carcinogens occur naturally in common foods such as potatoes and in less traditional foods such as herbal teas (Ames, 1983), many others are formed when the food is cooked. Carcinogens are formed simply by broiling or frying red meats or seafoods (Wishnok, 1984).

Nutritional Quality

Fish is an excellent source of protein and unsaturated fat, and a relatively good source of some vitamins and minerals. Under today's processing conditions, low-dose ionizing energy has little effect on the overall nutritive value of the food. Even at irradiation doses up to 10 times higher than those suggested for use with fish, the biological value of the proteins is not impaired. Fats are relatively stable and the nutritional quality of potassium, calcium, iron, and zinc is not affected. Vitamins such as riboflavin, niacin, folacin, and biotin are very stable. Levels of others may be reduced but not any more so than by other commercial processing techniques.

Adverse Findings

An Indian study in which malnourished children were fed freshly irradiated wheat is frequently cited by opponents as "the only study done on humans" (NCSFI, n.d.). In fact, numerous human feeding studies have been conducted, including several in the United States (Brynjolfsson, 1978). In recent human studies, 439 Chinese volunteers consumed irradiated foods. No evidence of adverse effects was found (Brynjolfsson, 1987).

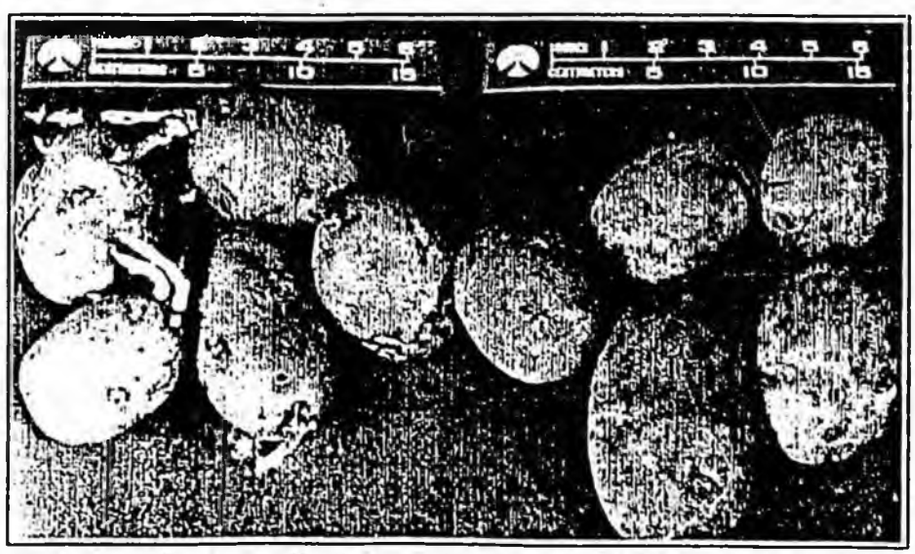
In the Indian study previously mentioned four of five malnourished children were reported to develop a chromosome abnormality known as polyploidy. In fact, most people, whether they are malnourished or not, exhibit low levels of polyploidy. In the Chinese studies, the incidence of polyploidy was actually reported to decrease when irradiated foods were consumed. In all of these studies, the "changes" observed were within the experimental error, indicating the effects were not significant.

An early review (1979) of the irradiation process was completed in Hungary by Dr. Joseph Barna. Opponents of the food irradiation process frequently cite this review as evidence that the process is unsafe (NCSFI, n.d.). In fact, Dr. Barna concluded that "neither stimulative nor adverse effects of the consumption of irradiated food are consistent, unambiguous and reproducible. Neither can specific effects be related to a given food, group, or level of radiation dose." He further emphasized the uncertainties of the evaluation, especially of the early work.

Since this review was completed and following subsequent research, the Hungarian government has given unconditional approval for using irradiation to decontaminate spices and to inhibit the sprouting of onions. Approval has also been granted to test market numerous other irradiated food products (FAO/IAEA, 1988).

Recent Reviews

Several reviews of the safety of the irradiation process have been completed in the past several years by interdisciplinary task forces. In an independent review requested by Congress, American scientists



Effect of irradiation on conventionally processed supermarket potatoes after one-month storage at room temperature: irradiated potatoes have not sprouted.

concluded that the process was safe and that nutritional adequacy compared favorably with fresh products or foods processed by traditional methods (CAST, 1986). A British task force reported similar conclusions (ACINF, 1986) as did a review by the United Nations World Health Organization (WHO, 1981). During the 1985 U.S. congressional hearings on food irradiation, the American Medical Association (AMA, 1985) testified that the process was safe and had the potential to improve public health.

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BASIC CONCERNS ABOUT FOOD IRRADIATION

by

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Background

In recent years, the food processing industry in the United States has been looking increasingly to irradiation as an alternative to the use of chemicals in the post-harvest treatment of food (AIF, 1986). This interest was heightened when the U.S. Environmental Protection Agency intended to ban the use of the fumigant ethylene dibromide for post-harvest treatment of grains and fruits in 1984 (Federal Register, 1984). Another consideration for the interest in food irradiation is the concern over economic losses due to food-borne diseases. It has been estimated that 24 to 80 million cases of food-borne diarrheal diseases go unreported every year, costing yearly between 5 and 17 billion dollars in economic losses (Archer and Kvenberg, 1985).

On April 18, 1986, the Food and Drug Administration (FDA) published its final rule making it legal, for the first time, to irradiate fresh fruits and vegetables. The purpose was to extend shelf life and provide pest disinfection with low-dose radiation (up to 100 kilorads), and it raised the dose level for microbial disinfection of herbs and spices from 1,000 to 3,000 kilorads without having to seek prior, individual, product-by-product approval (Federal Register, 1986). The rule also incorporated previous approval for irradiation of other food products such as pork for trichinosis control, white potatoes for sprout inhibition, and wheat and wheat products for insect disinfection.

The U.S. Department of Agriculture Food Safety and Inspection Service reaffirmed on December 5, 1986, its clearance of pork irradiation and petitioned the FDA to allow the irradiation of poultry products to control *Salmonella*. This petition was published in the Federal Register in February 1987, and in March 1987 the FDA published a similar petition from Radiation Technology, Inc., requesting irradiation treatment of poultry to control *Salmonella* (AIF, 1987).

On January 5, 1987, the U.S. Department of Agriculture Animal and Plant Health Inspection Service

*The views expressed therein do not necessarily represent the views of the NRC, IOM, NAE, or any of their constituent units.

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Working For Peace, Justice and Global Security

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April 5, 1991

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APR - 8 P.M.

Rep. Georgianna Lincoln
Co-Chair, House Health, Education
& Social Services Committee
Alaska State Legislature
P.O. Box V
Juneau, AK 99801

Dear Rep. Lincoln,

Your committee will soon consider HB-35, a bill sponsored by Rep. Randy Phillips which would ban the sale of radiation exposed food in Alaska, with certain exceptions. Our group strongly supports HB-35. Enclosed is a packet of information and a videotape on radiation exposed food produced by the British Broadcasting Company. The videotape is especially recommended as a good overview of the entire food irradiation issue.

Over the past four years, many of our 1,000 members have expressed grave concerns about radiation exposed food due to health and safety reasons. These concerns are addressed in the enclosed scientific articles and other material. For these same health and safety reasons, radiation exposed food has already been banned or restricted in three states and in several countries. Rep. Phillips' bill passed by a large margin in the House during the past two legislative sessions.

This issue may be of particular concern to you and your constituents because food irradiation has been proposed as a "solution" to the shelf life and preservation problems of much of the food being shipped to the Bush.

We hope that you will give Rep. Phillips' bill careful consideration and would appreciate knowing your position on this issue. I plan to be in Juneau lobbying during the week of April 21 and look forward to meeting with you then.

Sincerely,

Christopher Toal

Christopher Toal

Enclosures.

Mailing address: 3605 Arctic Blvd., #1717, Anchorage, AK 99503 Phone: (907) 272-0621

Responding to Food Irradiation

Questions and Answers About Radiation Exposed Food and Why its Sale Should be Banned in Alaska

Prepared by SANE/Alaska
(an Alaskan non-profit educational organization)

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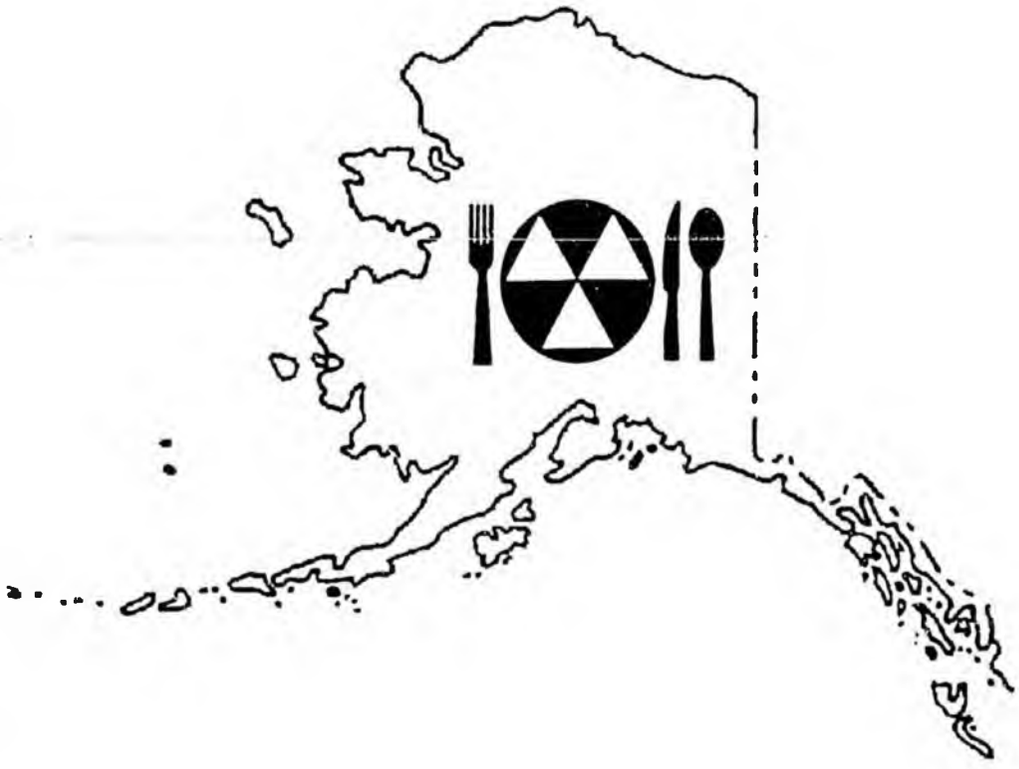

Responding to Food Irradiation

Questions and Answers About Radiation Exposed Food and Why its Sale Should be Banned in Alaska

Introduction

This information packet was prepared by SANE/Alaska, a nonprofit Alaskan educational organization. It contains information gathered by an informal coalition of Alaskan groups formed to address the issue of radiation exposed foods in our state.

Coalition participants have included SANE/ Alaska, United Fishermen of Alaska, Alaskans Concerned About Food Irradiation, Public Awareness Committee for the Environment and the Alaska Public Interest Research Group (AKPIRG).

Questions about this material should be directed to Christopher Toal, 272-0621.

Question 1: Proponents of radiation exposed food contend that "alarmist rhetoric from anti-nuclear activists" is the only barrier to public acceptance of radiation exposed food. Why should the Alaska State Legislature respond to "ill-informed anti-nuclear activism" by passing HB-35?

"Alarmist rhetoric" has nothing to do with the justification for banning radiation exposed food in Alaska. Name calling, allusions to Jane Fonda and conspiracy theories about anti-nuclear activists may play well to the media and those on the extreme right, but this approach evades the key issues about radiation exposed food.

It wasn't "alarmist rhetoric" that convinced the Republican and Democratic legislators and governors of Maine, New Jersey, and New York to ban the sale of radiation exposed food in their states. It was testimony from scientists and health professionals, a careful examination of the facts and a full-blown public debate.

A similar debate took place twice in the Alaska House of Representatives. Both times the House voted overwhelmingly to ban the sale of irradiated food.

Rep. Randy Phillips decided to introduce legislation banning the sale of irradiated food in Alaska after he was contacted by physicians and his constituent. They presented Rep. Phillips with scientific evidence which led him to question the safety of radiation exposed food. Only after he had introduced the bill did his office request information and support for the bill from public interest groups like SANE/ Alaska.

The Alaska State Legislature should pass HB-35 to protect the seafood markets of its fishing industry and the safety of the food supply for its residents.

Question 2: Advocates for the proposed Department of Energy food irradiator in Kodiak (canceled by Gov. Steve Cowper in 1989) argued that irradiating seafood could extend its shelf life and expand its markets. Shouldn't we encourage this?

The DOE sponsored feasibility study conducted at the University of Alaska-Fairbanks claimed that irradiation could expand the markets for Alaskan seafood.[1] But Alaska's seafood industry does not concur according to research conducted by Governor Steve Cowper. In announcing his cancellation of the state's participation in the DOE project in 1989, he characterized fishing industry opposition to irradiation exposed food as "virtually unanimous."[2]

The Alaska Seafood Marketing Institute

spends millions of dollars each year for a nationwide marketing campaign that focuses on Alaska's "pure and pristine image."[3]

This is the latest phase of a multi-million dollar marketing and quality control program to rebuild the image of Alaska's seafood. An incidence of botulism poisoning severely hurt the industry in 1982.

The seafood industry is concerned that the presence of a seafood irradiator in Alaska will damage the public image of, and threaten the markets for all Alaskan seafood whether it is irradiated or not.[4] Irradiation is inconsistent with the "pure and pristine image" which is used to sell Alaskan seafood. The apple industry's experience with the pesticide Alar demonstrates that consumers are not willing to buy foods of questionable safety.

Several credible public opinion polls have shown that consumers do not trust radiation exposed food. For instance, a poll conducted by Lou Harris for the Food Marketing Institute reported that only 13% of American shoppers think irradiated foods are safe.[5]

Many of the important markets for Alaskan seafood including Japan, Great Britain, the Scandinavian countries, West Germany, New Zealand, and some states have either banned the sale of irradiated food for public consumption, or halted further applications of irradiated food due to consumer opposition.[6]

Question 3: Since Gov. Cowper rejected the DOE's proposed demonstration irradiator, is a ban on the sale of irradiated food still needed?

Dr. Martin Welt is sometimes referred to as the "father of the irradiation industry in America." He was recently released from prison after serving a two year term for fraud and conspiracy due to 32 safety violations at his company, Radiation Technology, Inc. (the largest case of worker radiation overexposure in U.S. history). While in prison, Dr. Welt spent his time putting together a formal petition to the FDA to approve the irradiation of seafood.

Of the four states which rejected DOE food irradiators (i.e. Alaska, Florida, Hawaii, and Washington), construction plans for irradiators have already been announced by private industry in Florida and Hawaii.[7] Plans have also been announced to build an irradiator for imported Mexican seafood in Nogales, Arizona.[8]

During the last legislative session, the largest irradiation firm in the U.S. (Isomedix, Inc.) started lobbying the Alaska State Senate just two weeks after the State House passed a radiation exposed food ban (HB-25) by a vote of 31 to 4. Isomedix, Inc. was asking that HB-25 be defeated.[9]

Governor Cowper's rejection of DOE sponsored seafood irradiator in Kodiak did nothing to physically prevent private enterprise from building a seafood irradiator there. It's only a matter of time till seafood is approved by the FDA for irradiation. Alaska needs a radiation exposed food ban now more than ever if our consumers and seafood markets are to be protected.

Question 4: The proponents of irradiation exposed food say that the groups that have "approved" the process include the U.S. Food and Drug Administration (FDA) and the American Medical Association (AMA). Doesn't this demonstrate that irradiation exposed food is safe?

Contrary to the repeated claims of food irradiation proponents, the American Medical Association has not "endorsed" irradiation exposed food! The AMA's House of Delegates simply passed a resolution supporting the classification of food irradiation as a "process" rather than a additive. This is hardly an endorsement. To claim that it is grossly distorts the truth.

The criteria used by the FDA to prove

safety are not reassuring from scientific, legal, or statistical viewpoints. The FDA's approval is based on a theoretical model and an evaluation of 441 toxicity studies on the effects of irradiated food.[10] Out of these 441 studies the FDA selected only five animal feeding studies as a basis for its approval of irradiation exposed food.

When the FDA's five studies were reviewed by Dr. Donald B. Louria and his colleagues 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 analysis or because negative data were disregarded.[11]

One of the two studies also suggested that radiation exposed food could also have adverse effects on older animals. In a third FDA-cited study, animals fed a diet of radiation exposed food experienced weight loss and miscarriages, almost certainly due to irradiation-induced vitamin E dietary deficiency.

Thus, according to Dr. Louria, three of the FDA's studies do not document the safety of radiation exposed food at all. The other two studies appear to be methodologically sound, he says, but the foods used in the studies were irradiated at doses below the FDA-approved level of 100,000 rad. Therefore, they cannot be used to justify the irradiation of foods at levels currently approved. Now, the agency is considering adopting 300,000 rad as the general dosage level, but has not even requested new studies.

Additionally, neither the FDA's tests nor the model it used adhered to the traditional procedures and legal criteria for an FDA approval. Highly concentrated levels of food additives are normally fed to test animals as part of the FDA's approval process. This testing procedure for irradiated foods has not been utilized by the FDA.

Without concentrating possible carcinogens, animal feeding studies can, at best, only verify that less than one in ten, or perhaps one in a hundred animals will develop cancer. This is far from the safety level normally used by the FDA which typically requires less than one cancer incidence in a million, or even ten million cases. Further research is clearly required before Alaskans are subjected to radiation exposed foods.[12]

It is for reasons such as those outlined above that Rep. Leon Panetta (D-Calif), Chair of the House Select Committee on Hunger, has co-sponsored a bill that would withdraw the FDA's approval of radiation exposed food.

Question 5: Is there any credible evidence indicating that radiation exposed food is dangerous?

Yes. Dr. Richard Piccioni, who has a Ph.D in biophysics, is an expert on radiation exposed food. Dr. Piccione has conducted a thorough review of the scientific literature on radiation exposed food. His research review was published in the peer-reviewed scientific journal The Ecologist (1988, Vol. 18, No. 2).

Dr. Piccioni's research uncovered 40 credible scientific studies linking irradiated food with carcinogenic, mutagenic, and cytotoxic effects. These problems arise because new chemicals known as radiolytic products form when a food is exposed to ionizing radiation. The process actually causes atoms to be separated from their molecules which then form new chemicals.

Dr. Piccioni also found twelve other studies that verified the production of harmful radiolytic products in irradiated foods.[13] For example, a 1975 study by the National Institute of Nutrition (NIN) in India which fed irradiated wheat to malnourished children. This study found that a pre-cancerous chromosomal blood abnormality known as polyploidy increases when malnourished children are fed irradiated wheat. The level of polyploidy returned to normal after irradiated wheat was withdrawn from the diet.

A control group which ate non-irradiated wheat did not suffer increased levels of polyploidy. These results were reconfirmed in a 1986 study. Neither of these NIN studies have been refuted with peer-reviewed scientific research.[14]

Radiation exposed food proponents have for years, attempted to discredit these NIN studies by citing similar research conducted by the Shanghai Institutes of Radiation Medicine and Nuclear Research in the Peoples Republic of China. Until recently, this Chinese research had never been published or made available in an English translation.

When the studies were recently published, it was revealed that they confirmed the NIN studies' results. In fact, the "evidence" that irradiation proponents once used to refute the NIN studies actually expanded on the conclusions of NIN. The Chinese study found that healthy, well fed adults also experience significant increases in polyploidy levels when irradiated foods are consumed.[15]

Question 6: The World Health Organization has hailed radiation exposed food as a tool to deal with the world hunger crisis. Shouldn't we help promote this worthy goal by allowing the sale of radiation exposed food in Alaska?

The WHO is a body of the United Nations (U.N.) which is working for very worthy goals including an end to the world hunger crisis. The International Atomic Energy Agency and WHO sit on a Joint Expert Committee of the U.N., which has endorsed radiation exposed food as a tool to use in reducing food spoilage and resolving the world hunger crisis.

WHO's goals and assumptions differ dramatically from those of other experts who are working to end world hunger.

Irradiation is capital intensive and it significantly increases food prices. Commercial irradiation firms want to process high priced fancy foods like papayas, citrus, seafood, and poultry. Even after being irradiated, these foods remain perishable. They are not the kinds of foods used in famine relief efforts.

Dealing with hunger effectively requires a comprehensive plan to commit capital, technology and expertise to areas stricken by starvation and chronic, persistent hunger. The nuclear industry cannot be expected to make these kinds of commitments. Its goal is to maximize profit and (according to Congressional testimony by DOE), create a commercial demand for nuclear waste.[16]

Furthermore, every conference held or report issued om radiation exposed food by the World Health Organization has been done in conjunction with and spearheaded by the International Atomic Energy Agency, hardly an unbiased partner. No independent research on the safety of radiation exposed food has been funded or conducted by the World Health Organization.

Question 7: Proponents of radiation exposed food often present the argument that irradiated foods will be labeled and that consumers can choose not to buy them.[17] Wouldn't HB-35 pre-empt free choice for consumers who wanted to buy radiation exposed foods?

Although this might be a reasonable approach if labeling were strictly enforced, consumer choice has been and continues to be undermined. Loopholes already exist in FDA rules that allow foods containing irradiated ingredients and foods from restaurants to be sold without labeling.[18] And the FDA's attitude towards providing a real choice for consumers is not reassuring.

In 1984, the FDA proposed that no labeling be required for radiation exposed foods.[19] Since then, consumer advocates have been forced to wage vigorous campaigns to stop repeated FDA attempts to further undermine labeling requirements.

The FDA has neither the staff nor the budget

to assure that the existing labeling laws are enforced. Given the FDA's attitude about labeling, it is doubtful that consumers will be able to make an informed choice about whether to buy irradiated foods.

One purpose of government is to protect the public from unsafe products. If research indicates that radiation exposed food is hazardous, labeling will be inadequate to protect the public interest.

Question 8: Who is promoting radiation exposed food and why?

It is a documented fact that the primary advocates of radiation exposed food are the DOE and the international nuclear industry.

The food industry has reacted cautiously because of consumer opposition.[20] In fact, thousands of food wholesalers and retailers have pledged to avoid all radiation exposed foods. These include major food companies such as General Foods, Kraft, Quaker Oats, Campbell Soup Co., Kelloggs, Coca Cola, Pepsico, Borden Foods, McDonald's, Taco Bell, Pizza Hut, and Kentucky Fried Chicken.

One of the underlying reasons for promoting radiation exposed food is evident in the DOE's testimony at Congressional hearings on the By-products Utilization Program (renamed the Advanced Radiation Technology Program.) The DOE stated that its goal is:

"to transfer 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." [21]

Cesium 137 is the most troublesome component in nuclear waste. It comprises just 3% of the volume, but it emits 50% of the heat and 55% of the radioactivity in nuclear waste.[22]

The nuclear power and weapons industry has been crippled by nuclear accidents, prohibitive costs, and the lack of a solution for safely disposing of nuclear wastes. If a fully developed radiation exposed food industry creates a "socially redeeming" use for nuclear wastes, the nuclear industry could actually sell its nuclear waste, saving it hundreds of millions of dollars.

Our consumers and fishermen have better things to worry about than protecting their markets from such schemes.

Question 9: The DOE demonstration irradiator proposed for Kodiak would have utilized X-ray and electron beam technology, not cesium 137. Isn't this a safe and economical technology?

Beam technology irradiators destroy vitamins and minerals and produce the same radiolytic products in food as cesium or cobalt irradiators. This means that the same public health concerns that plague nuclear waste irradiators also apply to beam irradiators.

Additionally, the threat of worker exposure to high levels of ionizing radiation in an electron beam or X-ray irradiation facility is significant. The commercial irradiation industry has a deplorable worker safety record to date. There's ample reason to conclude that Alaskan workers would be similarly at risk in a beam technology facility.

Capital costs for electron beam/X-ray facilities exceed by a factor of at least two the costs for facilities using cesium 137.[23] The DOE's proposal to use an electron beam/X-ray ionizing radiation source in Alaska was more palatable because it did not use by-products of nuclear waste. However, its proposal was not economically justified.

Little incentive exists for implementing DOE's proposal. A private investor who develops a commercial food irradiator must maximize return on the investment. DOE's beam technology proposal was not realistic

because it was made possible solely by the availability of government research funding.

Irradiation critics believe the purpose of DOE's promotion of beam technology is to get a "foot in the door" for the irradiation industry. Once established, the industry would convert to the more economical cesium irradiators.

Question 10: Has the irradiation industry been a good neighbor to its surrounding communities?

The irradiation industry is virtually unregulated as compared to the nuclear power industry. Consequently, it has a very poor safety record. Many cases are documented where radioactive leaks have contaminated both facilities and workers.[24]

A typical accident occurred on June 6, 1988 at an irradiator owned by Radiation Sterilizers, Inc. in Decatur, Georgia. Several stainless steel capsules containing cesium 137 developed leaks, contaminating the company's office area, ten workers, and water in the 25,000 gallon storage tank. Neither the State of Georgia or the company knew how to deal with an accident of this type. It took months just to figure out how to start decontaminating the facility.[25]

Three other accidents have been documented in which cesium 137 or cobalt 60 have leaked. Improper procedures at each accident resulted in either worker contamination, radioactive waste disposal in public sewers, or spills onto the ground.[26]

Dr. Martin Welt is the one individual who has done more than anyone to create a radiation exposed food industry. He recently served a two year prison term for fraud and conspiracy due to 32 safety violations at his company, Radiation Technology Inc. Dr. Welt's repeatedly dismantled safety interlock resulting in the largest case of worker radiation overexposure in U.S. history.[27]

References

1) University of Alaska-Fairbanks publication entitled "Fact Sheet: Irradiated Foods - Alaska Commodities Irradiation Project - An Options Analysis Study." It's importamt to note that this report was authored by UAF employees who stood to significantly benefit from continued research at the proposed Department of Energy demonstration irradiator in Kodiak. This report was funded by a grant from the DOE.

Also see "Alaska Commodities Irradiation Project, An Options Analysis Study," University of Alaska-Fairbanks Report #87.51, December 1, 1988. page 6-1.

2) News release #89-25, issued by Governor Steve Cowper's office, 2/7/89.

3) News release issued by the Alaska Seafood Marketing Institute, see article in All Alaska Weekly, 12/2/88 entitled "Alaska Seafood Marketed Nationwide."

4) Letter from Copper River Fisherman's Cooperative to Governor Steve Cowper, dated 1/12/89, signed by Bill Lindlow, President.

5) Food Irradiation Information Manual, National Coalition to Stop Food Irradiation, page 24.

6) Resolution unanimously adopted by United Fishermen of Alaska in 1988 and 1989. Resolution numbers #88-2 and #89-1.

Also see Food Irradiation Alert, newsletter of the National Coalition to Stop Food Irradiation, March, 1989, Vol. 3 No. 2.

Also see Food Irradiation, Who Wants It? by Tony Webb, Tim Lang, and Kathleen Tucker, Thorsons Publishers, 1987, Page 9.

7) See newspaper articles:

The Tampa Tribune, Tampa Florida, July 27, 1989, Article entitled: "Tests to begin for irradiation plant."

Hilo Tribune Herald, Hilo Hawaii, July 11, 1989, Article entitled: "NJ Company looks into isle irradiation plant to sterilize imported medical gear."

8) See newspaper article:

The Nogales International, Nogales, Arizona, August 2, 1989, Article entitled: "Processing plant may employ 150 locally - Produce and seafood from Mexico will be purified."

9) See 1989 lobbying material from Isomedix, Inc. in the legislative file for HB-35.

10) Federal Register, April 18, 1986, 21 CFR, part 179.

11) "Zapping the Food Supply," by Donald B. Louria, M.D., Bulletin of the Atomic Scientists, September, 1990, Vol. 46, No. 7, p. 34-36. [Dr. Louria is Chairman of the preventitive medicine department at the New Jersey Medical School in Newark, New Jersey]

12) Richard Piccioni, Ph.D. (biophysics), Staff Scientist for Accord Research and Educational Associates, of New York. Presentations in Anchorage and Fairbanks, November 11 and 12, 1988.

13) Ibid.

14) Department of Health, State of New York, Roswell Park Memorial Institute, letter from cancer researcher George L. Tritsch, Ph.D. 2/5/88. Letter sent to CH2M Hill Company, Dr. Jacek S. Sivinski to point out inaccuracies in the testimony by Dr. Sivinski before the Legislature of the State of Hawaii.

Also see Food Irradiation Information Manual, National Coalition to Stop Food Irradiation, Page 13.

15) See "Food Irradiation Update" dated 1-19-89, published by Accord Research and Educational Associates, Inc., 314 W. 91st Street, New York, New York 10024

16) See Congressional Testimony before "The House Subcommittee on Department Operations, Research, and Foreign Agriculture," hearing on Food Irradiation and World Hunger, November 18, 1985.

17) Claim made frequently by radiation exposed food proponents. Examples include:

Position paper, Alaska Department of Health and Social Services, 2/2/88.

"Facts on Food Irradiation," guest column by Sidney Heidersdorf, Juneau Empire, March 21, 1989.

18) Federal Register, April 18, 1986, 21 CFR part 179.

19) Food Irradiation, Who Wants It? by Tony Webb, Tim

Lang, and Kathleen Tucker, Thorsons Publishers, 1987, Page XI.

Also see Food Irradiation Information Manual, National Coalition to Stop Food Irradiation, page 8.

20) Food Irradiation. Who Wants It? by Tony Webb, Tim Lang, and Kathleen Tucker, Thorsons Publishers, 1987, page 105.

Food Irradiation Information Manual, National Coalition to Stop Food Irradiation, page 22.

21) "A Plan for Recovery and Utilization of Nuclear Byproducts from the Defense Nuclear Fuel Cycle" by William Remini and John Jicha, Jr., of the DOE's Office of Defense Waste and Byproducts Management. This DOE document was presented in testimony before the Procurement and Military Nuclear Systems Subcommittee of the Committee on Armed Services, U.S. House of Representatives, March 1 and 2, 1983.

22) "Technology Update and Future Initiatives; Byproducts Utilization Program." This pamphlet was published by CH2M Hill, 6121 Indian School Rd., NE, Suite 206, Albuquerque, New Mexico 87110. CH2M Hill is one of the DOE's primary consultants in the development of radiation exposed food technology.

23) "Alaska Commodities Irradiation Project, An Options Analysis Study," University of Alaska-Fairbanks Report #87.51, December 1, 1988. See Page 11-21.

24) Food Irradiation Alert, newsletter of the National Coalition to Stop Food Irradiation, series entitled: "The Irradiation Industry Hall of Shame", March, June, and September issues of 1989.

25) See articles from various Georgia newspapers:

Atlanta Journal & Constitution, 11/6/88 "Feds Waived Tests of Device that now has Radiation Leak."

Brunswick News, 6/13/88 "Authorities Find Where Radiation Leaking at Plant."

The Atlanta Journal, 12/23/88 "Removal of Cesium is Delayed-DOE Hesitant to Truck Capsules Across Country."

26) "Who Are They and How do They Operate?," Food Irradiation Alert, newsletter of the National Coalition to Stop Food Irradiation, November 1989.

27) Ibid.

UNITED FISHERMEN OF ALASKA

211 4th Street, Suite 106
Juneau, AK 99801
907-586-2820

UNITED FISHERMEN OF ALASKA

Resolution 88-2

WHEREAS food irradiation destroys or depletes amino acids, nucleic acids, and vitamins A, B (thiamine), B2, B3, B6, B12, C, E, K and folic acid; and

WHEREAS foods high in polyunsaturated fatty acids (which are increasingly being valued for their contribution to health), when irradiated, form large molecules that cannot be degraded by the body, can partially obstruct blood vessels and increase blood pressure; and

WHEREAS food irradiation is known to produce unstable, chemically reactive free radicals which are highly toxic and increase carcinogenesis, mutogenesis and cardiovascular disease in animals and in man; and

WHEREAS reviews of the available literature on irradiated food overwhelmingly indicate adverse effects on animals including development of testicular tumors, kidney disease, shortened life spans, loss of weight, increased rate of infertility and death of offspring; and

WHEREAS the botulism bacterium, Clostridium botulism, is perversely resistant to gamma radiation (irradiation), while most of its natural competitors, including those that alert us to the decay of foods, are destroyed; and

WHEREAS resistant strains of Salmonellae have been developed by repeated irradiation under laboratory conditions; and

WHEREAS acceptable and effective methods of preserving food (freezing, canning, vacuum packing, etc.) already exist and irradiation does not eliminate the need for refrigeration, packaging and good food hygiene; and

WHEREAS several major markets for Alaska seafood, including Japan, Great Britain, the Scandinavian countries, West Germany, New Zealand and some states, have completely banned the sale of irradiated food for public consumption or halted further exploration of irradiated food due to consumer opposition; and

WHEREAS the price of irradiated food will be 2 to 24 cents per pound higher than non-irradiated food; and

WHEREAS the Department of Energy has provided $400,000 to the University of Alaska, Fairbanks, to help Alaska determine the feasibility of irradiating fresh and frozen fish, other seafood and agricultural products; and

WHEREAS the Department of Energy is the primary promoter of food irradiation as a means of inexpensively extracting weapons-grade plutonium from the reprocessing of nuclear waste; and

WHEREAS the specific use of radioactive cesium-137 or other radioactive waste products for food irradiation treatment in Alaska involves another whole range of concerns, including but not limited to worker and public safety (permitted radioactive emissions are 20 times higher than nuclear power plants); transportation of nuclear waste; construction of a radiation facility in a seismically inactive and tsunami-free area; and contamination of groundwater, the food chain and the environment by the highly water-soluble cesium-137 (half-life 600 years);

NOW THEREFORE BE IT RESOLVED that United Fishermen of Alaska strongly opposes the irradiation of seafood in the state of Alaska; and

BE IT FURTHER RESOLVED that United Fishermen of Alaska supports Senate Bill 355 and House Bill 388 which prohibit the sale of irradiated food in Alaska.

Jim Bacon
President

3-1-88
Date

Copper River Salmon

Produced By The Copper River Fishermen's Cooperative.

Governor Steve Cowper
P O. Box A
Juneau, AK 99811

January 12, 1989

Dear Governor Cowper:

The Copper River Fishermen's Cooperative strongly urges you to oppose the development of a seafood irradiation industry in Alaska. We are a Cordova-based cooperative of 100 fishermen who catch, process, and market primarily salmon, but also halibut, herring, herring roe-on-kelp, cod and sablefish.

We are opposed to seafood irradiation for the following reasons.

1) Our major markets, including Japan, have either banned import of or withdrawn support for irradiated foods. The European Parliament has already rejected food irradiation because of the potential health hazard. Europe has recently decided to stop importing U.S. beef because of the health hazard posed by chemicals. We are concerned that a ban may be placed on irradiated seafoods for similar reasons.

2) Irradiation of seafoods destroys nutritional value and increases the health risk of eating seafoods. Experiments with irradiation of mackerel oil, cod liver oil and herring flesh show that the highly publicized Omega-3 unsaturated fat and similar lipids are changed into known carcinogens. Additionally, the fish oils are changed into large molecules that cannot be digested by our digestive enzymes and, consequently, are deposited as insoluble plaques in blood vessels, thereby potentially increasing blood pressure.

3) Irradiation increases the health risks associated with long term storage. Botulism bacteria are resistant to gamma radiation. A dose strong enough to wipe out other bacteria would leave the botulism organism intact

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and without any competition to slow its growth. Irradiation also does not alleviate the need for proper handling of seafood during storage: organisms destroyed during irradiation will be quickly replaced unless preventative measures are taken.

4) Irradiation will increase the cost of seafoods to the consumer because of the additional processing.

5) There is a mounting consumer opposition to irradiated foods, both domestically and abroad. Consumer acceptance is doubtful and will not be known until irradiated products are test marketed. We do not think it is economically wise to use Alaska seafood as a test market.

6) Irradiation of seafood would destroy the fishing industry's marketing image of "pure and pristine" Alaskan seafood. This would undermine the work of the Alaska Seafood and Marketing Institute which has just spent $3.2 million to develop and promote this image in nation-wide advertising campaigns. Although the Cooperative would not consider irradiating any of its product, we are concerned that consumer perception of our product would be "tainted" by irradiation of other seafood products.

7) The United Fishermen of Alaska have adopted a resolution opposing the irradiation of seafood in Alaska.

We urge you to support us and the fishing industry in our opposition to irradiation of seafood. We appreciate the opportunity to comment on this issue.

Sincerely,

Bill Lindow, President

cc: Kate Grahm, UFA

FOOD IRRADIATION NETWORK JAPAN

February 9, 1990

Senator Fred Zharoff
Alaska State Legislature
P.O. Box V (MS 3100)
Juneau AK 99811 USA

Dear Senator Fred Zharoff,

We, Japanese consumers, welcomed Gov. Steve Cowper's announcement not to build a food irradiation demonstration facility in Alaska. However, we are now concerned that the private company Isomedix Inc. may be planning to build a food irradiator in Kodiak and that they are lobbying to prevent HB-25 from being passed.

As you know, Japan imports vast quantities of Alaskan seafood. According to the figures of 1988, we imported 38,919t of Herring, 154, 591 t of Cod, 106,386t of Salmon, 28,894 t of Crab from the United States (maybe from Alaska) , the top of seafood exporting nations to Japan. We have an image of Alaskan seafood as "fresh and safety" that, however, may be changed if a food irradiator is to be built in Kodiak.

We believe that safety of irradiated food is yet to be proved. The irradiation experiment done on onion in Japan by the Science and Technology Agency has proved to cause deformity in the bones of mice, and thus the onions have not been approved for irradiation. Potatoes have been approved before the onions, but we know that there has been increase of mortality rate, decrease of body and ovary weight in the experiments on rats and we are against irradiating potatoes as well.

Consumers are not only people who oppose irradiated food in Japan. Recently The Food Irradiation Network Japan sent questionnaires to 30 major seafood importers and asked whether they are willing to import irradiated seafood. Out of 17 responses we receiced, 7 importers said they would not import any irradiated seafood even if Japanese government lifts the present ban of importing irradiated food. Other 10

importers said they will follow the government' guidance on this matter. No company said they are willing to import irradiated seafood.

The Japanese Government prohibits the import of any irradiated food. We support this ban. Furthermore, should a seafood irradiator ever be built in Alaska, we will assume that at the least some of this seafood is destined for Japan. In that occasion, we will declare a boycott of all Alaskan seafood.

We strongly support HB-25 and we urge Sen. Zharoff to let this bill out of his Senate Finance Subcommittee. We also urge passage by the Senate and ratification by Governor Steve Cowper.

Sincerely yours,

Hiroshi Satomi

Dr. P.H. Hiroshi Satomi

The Food Irradiation Network Japan
(Affiliated Organizations:
Consumers Union of Japan, Kanagawa Network of Consumers, Kanagawa Network to Expel Toxic Food, Citizens' Nuclear Information Center, Tokushima Alliance for Better Living, Liason Council for Safe Food, Consumers Association of Mitaka City, Tokyo Liason Council of Consumer Organizations, Parents Accusing Irradiated Baby Food, and others)

cc: 57 copies sent to the govenor, Senators and seafood industry representatives

FOOD IRRADIATION NETWORK JAPAN
3-11-5-310 Higashinakano Nakano-ku TOKYO JAPAN 164
Phone 03-5380-1000 Fax 03-364-2937

March 26, 1990

Senator Fred Zharoff
PO Box (MS-3100)
Juneau, AK 99811

COPY

Dear Senator Fred Zharoff,

We appreciate you had interest in and refered to our letter in the Kodiak Daily Mirror. We found your article included misstatements and half-truth and so we would like to clalify it.

Proponents for food irradiation often state ionizing radiation is same as microwave, infrared, ultraviolent ray, etc but is quite different as regards the controversial point that ionizing radiation yields in irradiated food unkown products yet to be proved for safety. Possible effect of ionizing radiation is same whether it is released by radioactive materials or an electron particle beam accelerator suggested by the Institute of the University of Alaska Fairbanks.

Secondly, there is no scientific consensus that irradiated foods are wholesome. Though you disregarded the related statement in our letter, we had explained why no other food was permitted for irradiation after the permission of potatoes in our country. It was because bone abnormality was observed among mouse fed irradiated onion. Even irradiated potatoes, the sole food permitted for commercial irradiation, were found to cause weight reduction and higher mortality among animals fed potatoes irradiated with the present allowable radiation level of 15,000 rad. We, therefore, demand our government to cancel the permission of potatoes. In your country, was it the lack of scientific consensus on wholesomeness that led New York, New Jersey and Maine to a moratorium on food irradiation?

If Isomedix Inc. has no interest in food irradiation, why are they lobbying against HB 25 concerning food irradiation? Indeed, the company, according to

the source of IAEA/FAO/AECL 1986, has irradiated spices 500 tons per year since 1984. Furthermore, we warn you that an irradiation facility may be easily misused for other purposes. As one of such notorious abuses in our country, one food company had irradiated vegetables used for babyfood for several years falsely saying for animal feed. Untill the scandal was revealed, scores of thousands of infants were fed the irradiated babyfood. In 1984, both of the food company and the irradiator were sentenced guilty.

We like to talk about our "small organization." Our affiliated members, Consumers Union of Japan, Tokyo Liaison Council of Conumer Organizations, Kanagawa Network of Consumers and others have a long history of opposing food irradiation. Since potatoes were permitted for irradiation in 1972, we have long opposed against it and in 1978 successfuly stopped irradiated potatoes to be used in school lunch. In Tokyo, vocal activities of consumers made the Shihoro Agricultural Cooperative, the operator of the facility, not to ship irradiated potatoes into Tokyo. In big cities as Tokyo, Kanagawa and Saitama where consumers have stronger voices, irradiated potatoes had been and is successfully boycotted. You will find what impact our "small" network has once you have a food irradiation facility for Alaska seafood.

Our attitude to irradiated food is the same one whether it is Florida citrus fruit or Alaska seafood. Since we have no way to know if imported seafood is irradiated or not, we will declare a boycott of Alaska seafood if you ever have a facility. If you don't want to lose a big market including Japan in the world, we suggest you to move forward with HB 25. We believe such legislation will be beneficial to your public health and your seafood industry as well as to our consumers.

Sincerely yours.

Hiroshi Satomi

Hiroshi Satomi, Dr.P.H.
The Food Irradiation Network Japan

cc: 103 copies sent to the governor, Senators, Representatives and othe related organizations

ISOMEDIX

(PRO-IRRADIATION LOBBYIST)

PLEASE DELIVER IMMEDIATELY TO:

Name: Senator Dick Eliason, Chairman
Labor & Commerce Committee

Telephone No. 907 465 4928

From: George C. Giddings, Ph.D., Consultant

Date: 12 April 1989

Time Transmission began: 4 PM (eastern daylite saving time)

Number of pages: 19 (including cover sheet)

We are transmitting from FAX NO. (201) 887-1476)

If you do not receive all of the pages,
please phone us at (201) 887-4700.

COMMENTS:

I just learned that your Committee will be hearing HB 25 to ban sale of so-called irradiated foods in Alaska. Last year I and professional colleagues sent out considerable documented information in opposition to predecessor legislation in the Alaska State Legislature. Given the closeness of the hearing on HB 25, and rather than replicate that which was sent out by me and others last year, I am faxing herewith the following more recent items: (1) consensis document from 12/1988 International U.N. Food Irradiation Conference at WHO HQ, Geneva, (2) list of U.S. delegation, (3) WHO position paper, (4) WHO new book announcement, (5) first two pages of USDA 35 page detailed denial of a petition for a hearing on its omnibus irradiated food approval regulation of 4/16/86. Irradiated food is safe and offers proven public health benefits, already being realized in a growing number of countries, in the absence of any proven risks! Anti-nuclear organizations mistakenly associate it with their real agenda because of the tiny, self-terminating and unneeded DOE demo-irradiation program that Alaska recently dropped out of (even though it was to be a linear accelerator like Florida and Iowa's). The "bottom line" is that States should not be preempting in advance their consumer's right of informed free choice with ill-advised, misguided legislation, born of confusion and misplaced anti-nuclear activism when the worldwide trend is toward fact-based public acceptance in recognition of public health and other benefits, in the absence of significant risk.

Respectfully, G. G. Giddings
ISOMEDIX INC.

AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET • CHICAGO, ILLINOIS 60610 • PHONE (312) 645-5000 • TWX 910-221-0300

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ANDREA L. SCHNEIDER
Program Administrator
312 645-4532

April 11, 1988

John V. Kelly
Essex County
Assemblyman 30th District
484 Bloomfield Avenue
Suite 11
Montclair, New Jersey 07042

Dear Assemblyman Kelly:

The American Medical Association, apart from Dr. Lubin's testimony, has not conducted any studies or issued reports on the safety of food irradiation. At the present time, neither the AMA's Council on Scientific Affairs nor the Group on Science and Technology has any plans to conduct such a study.

If we proceed with a report in the future, I shall see to it that you are so notified.

Sincerely yours,

William T. McGivney, Ph.D.

WTH:pjc

(Note fom Kelly Staff: A review of Dr. Lubin's testimony, the AMA Constitution ar Bylaws disclosed the following: The House of Delegates is the policy making body the AMA [Article VI, AMA Constitution]. In June 1984, AMA House of Delegates pass Resolution No. 128, which supported "legislation classifying irradiation as food process rather than a food additive." Testimony is not policy, it simply may not "conflict with the policies of the House of Delegates" (AMA Bylaw 12.20) The AMA House of Delegates never said irradiated food was safe, they simply said it shou be considered a process. Even the "process" resolution has little significance, s it was voted on a consent calender, meaning the House of Delegates never discusse the issue. The introduction to the resolution, (the whereas section) is not the resolution, nor was it read to the House, it serves as "fill". Reference to food irradiation being safe in the introduction to the resolution, and Dr. Lubin"s testimony has been taken out of context to falsely imply that the AMA House of Delegates has endorsed the safety of irradiated food. The confusion is understan

A-3

FAIRBANKS
Daily News-Miner
Your Locally Owned Independent Daily Newspaper
Sunday A.M.
VOL. LXXIVI. No 314 FAIRBANKS, ALASKA, SUNDAY, NOVEMBER 13, 1988 $1.00 Per Copy 100 Pages

Expert finds dangers in food irradiation

By PATRICK HUND
Staff Writer

The Food and Drug Administration has approved the use of irradiation for some food products without proving it is safe for human consumption, says a doctor from a New York-based health research organization.

"FDA approval of irradiation testing is not based on stringent scientific standards," said Dr. Richard Piccioni, who has a doctorate in biophysics and works for Accord Research and Educational Associates. "I think it's wishful thinking."

Piccioni spoke about food irradiation at 7 p.m. Saturday at Wood Center on the University of Alaska Fairbanks campus.

Food irradiation prolongs the shelf life of food products by killing bacteria and delaying the ripening process. Irradiation has been approved by FDA for use in spices, some vegetables, and to sterilize medical supplies.

Currently, a team of UAF researchers are completing a report that will be submitted to the state on whether the state should consider irradiation for seafood and agricultural products. The $400,000 report should reach Gov. Steve Cowper in the next month.

Radiation is the release of nuclear particles. The particles can be released from either machine devices such as X-ray machines or with the use of gamma sources such as Cesium, a by-product of nuclear power plants.

Piccioni claims that FDA hasn't shown how food is chemically changed in the irradiation process. Irradiation leaves unknown residues and undefined chemical changes in food products, some of which may be cancer-causing he said.

RICHARD PICCIONI
More research needed

"If you're talking about feeding millions of people irradiated food, you have to make sure the residues are not carcinogenic," he said.

He said the FDA has used research tests that conclude lab animals weren't physically harmed by irradiated food. Instead, the administration should have fed high concentrated levels of irradiated food to lab animals, he said.

In most food research tests, lab animals are fed concentrated levels of substances much higher than humans would normally consume. That's to prove beyond a shadow of a doubt that the substances won't have serious long-term health effects in people, he said.

"It is presumed that the basic toxological issues have been re-

(See IRRADIATION, page A-2)

IRRADIATION

(Continued from page A-1)

solved," he said. "They haven't."

Piccioni points to conclusions of dozens of studies that indicate irradiation can damage chromosomes and pose other health risks.

However, a significantly larger number of studies show that the irradiation process isn't dangerous, he said.

He said a number of independent scientists have called for further research in food irradiation before the FDA approves the process in more food products.

Piccioni said $200,000 grant was suggested for a study of irradiation by the National Academy of Sciences, but the grant was denied by the U.S. Congress.

Irradiation isn't like other processes that change the chemical composition of food products such as pasteurization of milk, he said.

Astronauts might be able to use irradiated food in space without suffering short-term health problems, but research hasn't shown what could happen to them in the long run, he said.

If the technology is to be used in Alaska, the UAF team has recommended that electron beams, not radioactive isotopes, become the energy source for the process.

One UAF research member, Ruthann Swanson, says most of the food on a menu could pose health hazards if taken in large enough quantities.

"There are lots of natural ingredients in foods that are toxic," she said.

The use of irradiation in Alaska food products could have far-reaching effects, she said.

"If the technology becomes accepted, there is potential for Alaska products to enter bigger and more distant markets," she said.

the Kodiak daily mirror

VOL. 50 NO. 21 | WEDNESDAY, MARCH 21, 1990 | KODIAK, ALASKA | 28 PAGES | 50 CENTS

Pressure builds for ban on irradiated food in Alaska

By CECIL RANNEY
Editor

The struggle over use of nuclear technology has once again focused on Kodiak.

Irradiation of food, a controversial preserving method that utilizes radioactive material to destroy bacteria has been suggested for use on seafood.

Proponents of nuclear energy hope a beneficial use of nuclear waste for such projects as food irradiation will give their industry a more positive image.

Opponents worry about health risks to workers and consumers from any use of nuclear waste material and say irradiation would destroy seafood's healthy image.

The issue has come to focus on a bill, HB-25, that would ban the sale of irradiated food in Alaska. HB-25 passed the House last year but since last April has been held up in a Senate Finance subcommittee by Sen. Fred Zharoff.

Anti-nuclear activists in Alaska, led primarily by SANE/Alaska, an Anchorage-based group, have targeted Sen. Zharoff with a letter-writing campaign to try to force him to pass HB-25 out of committee.

The attack on irradiated food focuses on the pure and pristine image of Alaska's seafood, especially in Japan. A Japanese consumer group has threatened a boycott of Alaskan seafood if an irradiator were to be built in Alaska.

Japan is the major market for Alaska seafood and has banned the import of irradiated foods.

Many of the letters claim a seafood irradiator will be built in Kodiak, although no evidence of any plans for such a plant have been offered or revealed.

Last year, the University of Alaska studied a proposal to construct a test irradiation facility with $400,000 of federal money. The University was to place a linear accelerator in Kodiak as part of the Fisheries Industrial Technology Center.

Governor Steve Cowper killed the plan by refusing the federal money offered. At the time he said he was concerned Alaska seafood might be associated with food irradiation, and that might have a detrimental effect on seafood sales.

Dr. John French, of the FITC in Kodiak, said there were no plans to build an irradiator in Kodiak now.

"Things are very much on hold," he said. "The state government is not pursuing it and the University is not interested, especially since there is no federal money."

Zharoff said he felt it was premature to ban a technology that could possibly be of benefit to the fishing industry.

"It's been my experience that once something gets banned it is very difficult to get it back."

Ed Davis, vice president of SANE said that without HB-25 the irradiation industry would have a green light.

"Private enterprise has already announced plans to build irradiators in two of the four states that rejected Department of Energy irradiators. The largest irradiation firm in the country, Isomedix, Inc. is lobbying to kill HB-25," he said.

In a lobbying report, an Isomedix consultant portrayed HB-25 as an attempt to limit the free choice of consumers with "ill-advised, misguided legislation, born of confusion and misplaced nuclear activism when the worldwide trend is toward fact-based public acceptance in recognition of public health and other benefits in the absence of significant risk."

If HB-25 is not passed by the Senate before the end of the current session it will be dead and that is apparently the wish of Sen Zharoff. He said he plans to continue to hold the bill in his subcommittee for further study.

The Pioneer 50¢

ALL-ALASKA WEEKLY

Vol. 18, No. 35 Fairbanks, Alaska February 9, 1989

Irradiated food facility stalled

by Lin Gale

Gov. Steve Cowper announced Tuesday that Alaska has decided against building a food irradiation demonstration facility in Kodiak.

The governor said the decision was made in large part because of opposition from Alaska's seafood industry. Fishermen and seafood industry officials say public fears about irradiated food could put a sizeable dent in the sales of Alaska seafood. Major markets such as Japan and European countries have banned imports of irradiated food.

Food irradiation is the process of treating food with ionizing radiation to kill microorganisms and extend shelf-life.

The University of Alaska Fairbanks Institute of Northern Engineering recently completed a feasibility study of food irradiation and recommended seeking $3.5 million in federal funds to build a demonstration facility in Kodiak.

University researchers banking on the facility and its accompanying federal funding to continue their research feel Cowper based his decision on the irrational fears of the facilities' proponents.

"I am disappointed that the scientists here in the state will not have a chance to follow up on research suggested in the study," said William Workman, a UAF resource management professor who participated in the study.

James Drew, dean of UAF's School of Agriculture and Land Resources Management, believes the governor's decision was swayed by politics, not by knowledge. Drew said the study's participants were asking to research, not to irradiate. In Drew's opinion, emotions expressed to the governor from the seafood industry and nuclear energy opponents proved more effective than facts and figures presented by university researchers.

"Facts and figures are a poor tool against emotion," Drew said.

The study's principle researchers, Ruthann B. Swanson, UAF assistant professor of resource management, and John

See FOOD, Page 16

Food irradiation plant rejected . . .

From Page 1

Zarling, associate dean of UAF's School of Engineering, were unavailable for comment.

Aside from unanimous opposition from the state's seafood industry, a group called The Alaska Chapter of the Committee for a Sane Nuclear Policy, (SANE/ALASKA) waged a strong and effective letter-writing and media campaign against the facility. (The federal Food and Drug Administration has determined that irradiated food is safe for human consumption but has not approved irradiation for the processing of fishery products.)

Ed Davis, president of SANE/ALASKA, is pleased with Cowper's decision but vows to continue the fight.

"I'm really elated to see that Gov. Cowper decided not to go ahead with the food irradiator — and he's doing it for all the right reasons too," Davis said. "But, he's not digging into this as far as I'm concerned. Essentially what Cowper's doing is keep the back-door open. It's pretty obvious that Cowper's going out of his way to not criticize it as being unsafe."

SANE/ALASKA's opposition to food irradiation is based on its members' claims that irradiated foods have not been proved safe. Another overriding concern is that food irradiation is a Department of Energy ploy to create a demand for nuclear waste products, such as cesium-137, and thus legitimize the nuclear power industry.

"The goal of this program is to create a demand for cesium," Davis said. "It legitimizes the need for nuclear power if there's a demand for cesium."

Ionizing energy required for food irradiation can be produced by machines that emit high-energy electron beams or X-rays, or by radioactive isotopes such as cesium-137 that emit gamma rays. University researchers recommended machines that emit high-energy electron beams or x-rays rather than radioactive isotopes as the ionizing energy source for a research and demonstration facility in Alaska.

Though the university recommends X-rays rather than radioactive isotopes for Alaska's irradiation facility, Davis opposes any irradiation facility in Alaska.

"It looks like they're trying to get their foot in the door for food irradiation," Davis said.

Though the proposed food irradiator has been laid to rest, SANE/ALASKA members have only begun their fight against food irradiation. Legislation banning the sale of irradiated foods (HB-25) is now in the House Finance committee. An identical bill (HB-388) passed in the State House by a vote of 32-7 last year but died in the Senate.

Bills that would outlaw the sale of irradiated food are being considered in Massachusetts, Vermont, New Hampshire, New York, Pennsylvania, Oregon and Minnesota. Similar legislation has already passed in Maine, and most recently New Jersey.

Dear Editor:

The February 9 edition of the All-Alaska Weekly had an article with some statements by UAF food irradiation researchers which require some clarification. Researchers portrayed their opponents as "emotional" people touting "irrational fears."

SANE/Alaska was very careful throughout the campaign to present arguments that were based on scientific evidence or that were well documented. What is irrational and emotional about facts such as these?

1) Over 40 scientific studies have found that exposure to irradiated foods causes mutagenic, carcinogenic, or cytotoxic effects. SANE/Alaska paid to bring an expert on food irradiation research, Dr. Richard Piccioni (who has a Ph.D in biophysics), to Alaska to discuss this scientific evidence.

2) Revealing quotes were made by Department of Energy (DOE) officials who lobbied for the program that funded the UAF food irradiation study. One official stated that the success of this program will be measured by "the degree to which this technology is implemented industrially and the subsequent demand created for cesium-137."

Cesium-137 is the most troublesome component in nuclear waste. It comprises just 3 percent of the volume, but emits 50 percent of the heat and 55 percent of the radioactivity in nuclear waste.

3) UAF staffers portrayed their proposal as a research irradiator. Their proposed "research" excluded any analysis of whether irradiated food damages health. Instead they proposed research to help commercialize the technology.

4) The seafood industry and the general public overwhelmingly opposed this irradiator. This opposition was not based on emotionalism or alarmist rhetoric. Rather, it spontaneously arose because UAF, FDA and DOE refuse to acknowledge and address valid concerns such as these.

Gov. Cowper was correct in noting that Alaska's seafood market would suffer. The public and the seafood industry do not appreciate being used as guinea pigs.

Sincerely,
Ed Davis, President, SANE/Alaska
Box 1616, Fairbanks, Ak. 99707

FAIRBANKS
Daily News-Miner
Your Locally Owned Independent Daily Newspaper
Wednesday
VOL. LXXXVII No. 38 FAIRBANKS, ALASKA, WEDNESDAY, FEBRUARY 8, 1989 50¢ per copy 36 Pages

State won't seek funding for food irradiation plan

Staff and AP reports

Despite a university report recommending a food irradiation demonstration project in Alaska, Gov. Steve Cowper said Tuesday that the state will not seek federal funding for the plant.

At issue is whether the state should apply for federal funds to build a test facility to expose foods to small doses of radiation to kill bacteria and parasites, Cowper said.

"I don't normally discourage the seeking of information about new techniques," he said. "But I'm convinced that the association of Alaska with food irradiation will have a detrimental effect on Alaska seafood sales."

The state's seafood industry opposes the irradiation project, Cowper said.

At least two commercial fishing groups recently sent letters to Cowper opposing the test use of irradiation in the seafood industry. The Copper River Fishermen's Cooperative and the United Fishermen of Alaska both expressed concern on the potential health risks associated with the process and that many countries already ban the sale of irradiated food products.

The idea also has come under fire from SANE/Alaska, which is questioning the Food and Drug Administration's approval of food irradiation. The federal agency already has approved the use of irradiation in spices, medical supplies and some vegetables.

Ed Davis, president of the group, believes there has been insufficient research on irradiation to prove that it doesn't pose health risks.

The University of Alaska Fairbanks Institute of Northern Engineering recently completed a $400,000 analysis of food irradiation and recommended a test facility in Alaska late in 1988.

William Workman, associate professor of economics and a member of the university research team, said the state's position on the issue could be a "missed opportunity."

He said many of the questions posed by opposing groups would be answered if a research facility was built.

"This isn't an immediate proposal for commercial application," he said. "I don't understand how commercial sales of Alaska seafood could be affected negatively with a research facility in the state."

Supporters of food irradiation say it would extend the shelf-life of food products and would benefit producers and retailers.

Legislation to prohibit the sale of irradiated food in Alaska was considered by lawmakers last year and is under review again this session.

Bills that would ban the sale of irradiated food are being considered in Massachusetts, Vermont, New Hampshire, New York, Pennsylvania, Oregon and Minnesota, according to a SANE/Alaska news release.

Opponents of using radiation to kill food bacteria say the U.S. Food and Drug Administration has not approved the process for wide use and consumers are suspicious of the process.

FAIRBANKS
Daily News-Miner
Your Locally Owned Independent Daily Newspaper
VOL. LXXXVI No. 338 FAIRBANKS, ALASKA, THURSDAY DECEMBER 8, 1988 50¢ Per Copy 32 Pages

Seafood irradiation center recommended

By PATRICK HUND
Staff Writer

A University of Alaska Fairbanks research team has recommended that a research and demonstration food irradiation facility be built in the state to test market seafood. The preliminary cost of the facility is estimated at $3.5 million.

However, results of the $400,000 study continue to come under fire from SANE/Alaska, a citizens' committe advocating sane nuclear policy. The group and other opponents of food irradiation say the process lacks sufficient scientic testing.

Seafood irradiation could be a boon to the state economy because it would increase the market value of seafood, allowing Alaska to enter markets in areas around the world.

The report, delivered to Gov. Steve Cowper's office earlier this week by the research team, said commercialization of the process in the state is premature for several reasons.

- Food irradiation hasn't been approved by the Food and Drug Administration for seafood products.
- The effects of irradiation on the seafood processing industry are unknown.
- Customer acceptance won't be known until irradiated products are test marketed.

Food irradiation prolongs the shelf life of food products by killing bacteria and insects and delaying the ripening process. FDA has already approved the use of irradiation in spices, medical supplies and some vegetables.

The process has gained approval from most scientific groups including the World Health Organization and the American Medical Association. Yet, some studies indicate that food irradiation poses health hazards.

Opponents say irradiation leaves residual and undefined chemical changes in food. It may produce cancer-causing carcinogens, they contend.

Ed Davis, president of SANE/Alaska, says that laboratory tests are inconclusive because animals were not fed concentrated amounts of irradiated food. He believes further testing is necessary.

Davis charges that UAF approval of the study will be used by the Department of Energy to get private industry to build food irradiators using cesium-137 as an ionizing source. The research report recommends that funding for the demonstration facility come through DOE.

Davis and other opponents believe that DOE wants to get rid of surplus cesium-137 produced by nuclear power plants by supporting irradiation.

Alaska was one of six states commissioned to conduct studies to determine the commercial potential of food irradiation.

Letters to the Editor

The Daily News-Miner welcomes letters to the editor, P.O. Box 710, Fairbanks, AK 99707. Each letter must carry the name and address of the writer, which will be published. Letters that are libelous or in poor taste will be rejected. Thank-you letters will be published in the "Applause" column. Because of space limitations, the following rules generally apply: A letter may not be longer than 300 words. Copies of letters from one person to another will not be published. No one may publish more than one letter per month. Political endorsement letters from outside our readership area will not be published. The Daily News-Miner reserves the right to edit or reject any letter submitted.

Halt irradiation

Dec. 16, 1988
P.O. Box 1618
Fairbanks, AK 99707

To the editor:

The Fairbanks Daily News-Miner printed an article on Dec. 8 regarding the UAF's recommendation to build a food irradiator in Alaska. I would like to expand on some points it made.

The university claimed that the FDA and the AMA approved the process. These claims need closer public scrutiny.

The AMA was asked to explain their endorsement just before the New Jersey State Assembly voted overwhelmingly to outlaw the sale of irradiated food earlier this year. The AMA responded that it had never conducted any studies or issued reports on the safety of food irradiation.

Although the FDA has approved food irradiation, the tests they used to prove safety are not reassuring. Their approval is based on five animal feeding studies, none of which utilized a critical test procedure. Studies in which highly concentrated levels of radiolytic products are fed to test animals are absent in evaluating food irradiation's safety.

Without concentrating possible carcinogens, animal feeding studies only verify that there will be less than one cancer incidence in about 100 rats. This is far from the safety levels normally used by the FDA which typically allows no more than one cancer incidence in 10 million cases.

Over 40 scientific studies analyzing the safety of irradiated foods found adverse health effects including carcinogenicity, mutagenicity, and cytotoxicity.

Alaskans should understand how the UAF's proposal fits into the overall picture. The DOE program which funded the UAF study has a goal of establishing a fully developed food irradiation industry. Congress was told during hearings on this issue that this DOE program's success will be measured by "the degree to which this technology is implemented industrially and the subsequent demand created for cesium-137."

The UAF study recommends X-ray and electron beam technology rather than cesium-137. This was an admirable decision, but only a nearsighted policy-maker would find it attractive.

If Gov. Cowper buys this tactic, the UAF project will establish a new "food irradiation frontier" in Alaska. It's unfortunate, but when industry moves in to settle this frontier, Alaskans will have little hope of extracting "admirable" decisions from the nuclear industry.

Sincerely,
Ed Davis, President
SANE/Alaska

Bristol Bay Times & Dutch Harbor Fisherman

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Fish irradiation prospects worry Japanese

by David McElroy
Staff Writer

JUNEAU — A Japanese threat to boycott Alaska seafood may cancel plans to build the state's first food irradiation plant in Kodiak.

The Food Irradiation Network (FIN) in Tokyo, Japan, wrote Alaskan legislators and editors to support a ban on irradiating food in the state after learning "that the private company Isomedix inc. may be planning to build a food irradiator in Kodiak."

The Japanese government prohibits the import of any irradiated food. Irradiated food is exposed to low doses of radiation to increase its shelf life.

FIN said "should a seafood irradiator ever be built in Alaska, we will assume that at least some of this seafood is destined for Japan. In that occasion, we will declare a boycott of all Alaskan seafood."

FIN, a Japanese consumer group, cited Japanese Science and Technology Agency tests of irradiated food. "There has been increase of mortality rate, decrease of body and ovary weight in experiments on rats."

The group urges passage of House Bill 25, which would ban food irradiation in Alaska.

FIN "welcomed Gov. Steve Cowper's announcement not to build a food irradiation demonstration facility."

See IRRADIATION Page 2

Irradiation worries Japanese consumer group

Cont'd. from Page 1

HB 25 has been lingering in the Senate Finance Committee chaired by Sen. Fred Zharoff since last April.

"There seems to be some reluctance on Fred's part to move on that bill," said sponsor Randy Phillips (R-Chugiak-Eagle River).

"Japan consumes about a third of our fish," Phillips noted. "If HB 25 gets on the floor of the Senate, I think it has a very good chance to get passed."

Zharoff aide Michael Thill said Wednesday "at this time, it may be imprudent to invoke a total ban" on irradiated foods.

"Incomplete scientific data" was cited by Thill in commenting on Zharoff's intransience on HB 25. Irradiation "may be a problem," he conceded, although "some tests say it is not."

But another Zharoff aide said the senator is "undecided" about banning food irradiation in Alaska. He said it was the University of Alaska which "concluded there weren't any problems with food irradiation."

Jerry Burnett, Phillips' aide, spoke of "the potential effect of seafood marketing in Japan if we had an irradiation facilitity, since Japan is our largest market." Phillips is a commercial fisherman himself, Burnett said.

Isomedix Inc. could not be reached for comment.

Of FIN, Zharoff aide Penelope Goforth said "nobody seems to have heard of them. We're checking to see if they're a legitimate group."

FIN declared that their own survey indicated many fish importers would refuse irradiated seafood even if the Japanese government allowed it.

In 1988, Japan purchased more than 200 tons of Alaska salmon, herring and crab.

Times BUSINESS (ANCHORAGE TIMES)

Thursday, March 15,

Fishermen promote new bill to ban irradiated food sales

By JAY STANGE
Times Business Writer

Alaska fishermen are watching a House bill that would ban the sale of irradiated foods in Alaska, saying such legislation would help protect the pristine image of the state's $1.096 billion in seafood exports.

Although no food irradiation plant is planned for Alaska, United Fishermen of Alaska supports House Bill 25 to ban the sale of irradiated food, said Ken Castner, the group's executive director.

The state House passed the bill 31-4 last April. It is being held by Sen. Fred Zharoff in a Senate Finance subcommittee.

The Consumers Union of Japan — a coalition of 25 consumer groups — has told Zharoff it will boycott all Alaskan seafood if a seafood irradiator is ever built in Alaska. In 1989 Japan imported Alaska seafood worth $999 million, or more than 95 percent of the state's total seafood exports, said a spokesman at the Alaska Center for International Business.

Zharoff said he is holding the bill in committee for further study. The state was hasty in dismissing a research project offered by federal agencies, he said.

A year ago, Governor Steve Cowper declined federal funding for a small scale U.S. Department of Energy irradiation pilot project. At the time, the proposal was made to six states with large agricultural resources, said a DOE spokesman.

"The governor was hoodwinked into saying he didn't want to conduct research," Zharoff said.

Last year, the University of Alaska Fairbanks Institute of Northern Engineering studied the proposal to construct a test irradiation facility with $400,000 of federal money, said Ed Davis of SANE/Alaska, an Anchorage-based political action group. The study proposed the placement in Kodiak of a linear accelerator one-fourth the size of a commercial irradiator.

It found irradiation of the type specified for the Kodiak site to be completely safe, Zharoff said.

Cowper said at the time he was concerned Alaska seafood might be associated with food irradiation, and that might have a detrimental effect on seafood sales.

Irradiation of seafood in the U.S. has not been approved by the Food and Drug Administration, Zharoff said.

The process was first approved for use on wheat and wheat flour by the FDA in 1963. It exposes foodstuffs to ionizing radiation to kill bacteria and insects and prolong shelf-life of vegetables and fruits by slowing the growth of sprouts. Food is irradiated in the U.S. by exposing it to electron beams, X-rays or gamma rays created by Cobalt-60 or Cesium-137.

Proponents of irradiation testified during an irradiation hearing before a congressional Health and the Environment subcommittee in June of 1987 that irradiation can prolong the shelf-life of products.

"We're looking at the overall impact," Zharoff said. "If we completely disallow the study (of irradiation) that may cause serious problems for food technology in the future."

"We think it's (irradiation) a bad idea," Castner said. "We're in a world market where fish product quality is a cornerstone. Quality is a big issue. If there is a public perception of 'dutching' where they take semi-poor quality food and irradiate it — that something we can't allow to take place."

Retailers, as much as processors, could be interested in the process, Castner said.

"It would be like backing nuclear reactor power in Alaska. Why do that when we have such good sources of power in the state like gas, coal and oil?" Castner said.

The seafood irradiation issue has attracted the attention of citizen groups like SANE/Alaska and Food and W Inc. of New Jersey.

"The Kodiak plan (to use an ele source of irradiation) was really a to get a (DOE) foot in the door fo use of the Cesium-137 isotope (t product is the creation of plutoniu use in military weaponry)," said D SANE/Alaska's vice president.

The DOE is trying to create a m for their waste products like Ces 137, Davis said.

"We agree more research is n sary. (But) we need objective rese by biophysicists," he said.

Sen. Fred Zharoff
... holding bill for study

NOTE: HB 25 DOES NOT PROHIBIT RESEARCH!

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JUNEAU EMPIRE

"The Voice of Alaska's Capital City"

MY TURN

Food irradiation

By ED DAVIS

A column by Sidney Heidersdorf published last spring on food irradiation contained a number of inaccuracies.

SANE/Alaska (a group which advocates SANE nuclear policies) waged an effective campaign to stop a seafood irradiator, which was proposed in Kodiak. As President of this group, I feel compelled to set the record straight.

Mr. Heidersdorf dismissed the opposition to food irradiation as a "strong emotional response" against nuclear technology. As a professional engineer, I know the importance of framing the debate in this type of campaign around scientific evidence rather than emotional arguments.

Our group organized a speaking tour in Alaska for Dr. Richard Piccioni, an expert on food irradiation research from New York. He has a Ph.D. in biophysics.

His research has uncovered an overwhelming body of scientific evidence linking irradiated food with carcinogenic, mutagenic, and cytotoxic effects. These problems arise because new chemicals known as radiolytic products form when a food is exposed to ionizing radiation. Both the FDA and Mr. Heidersdorf's guest column used "sleight of hand" arguments to dismiss this evidence.

A prime example is a study by the National Institute of Nutrition in India which fed irradiated wheat to malnourished children. This study found that a chromosomal blood abnormality known as polyploidy increases when malnourished children are fed irradiated wheat. The level of polyploidy returned to normal after irradiated wheat was withdrawn from the diet.

A control group which ate nonirradiated wheat did not suffer increased levels of polyploidy. These results have never been refuted with peer reviewed scientific literature. This is only one of many scientific studies which the FDA has failed to address in a scientific manner.

The tests used by the FDA to prove safety are not reassuring from a statistical viewpoint. Their approval is based on five animal feeding studies, none of which utilized a critical test procedure.

Studies in which highly concentrated levels of radiolytic products are fed to test animals are severely lacking in determining the real safety of irradiating foods.

Without concentrating possible carcinogens, animal feeding studies of this type can, at best, only verify that less than 1 in 10, or perhaps 1 in 100 rats will develop cancer. This is far from the safety level normally used by the FDA which requires less than one cancer incidence in 10 million cases.

The FDA issued approvals in 1986 for irradiation of fruits, vegetables, pork and spices. This action relies on a relatively new policy known as "deminimis." It allows approval of food additives if the FDA determines that cancer risks are very small (by law, food irradiation is treated as a food additive).

A federal law known as the Delaney Clause conflicts with the Diminimis Policy. It requires a chemical to be proven safe before it can be approved as a food additive. This law states that "no additive shall be deemed safe if it is found to induce cancer when ingested by man or animal."

When the approval of certain slightly carcinogenic red food dyes was challenged in a recent court case, the FDA's Diminimis Policy was found illegal. FDA's approval of food irradiation also lies on a tenuous legal foundation.

The University of Alaska-Fairbanks issued a report last December that recommended building a demonstration food irradiator in Kodiak. A relatively small facility was recommended which would utilize electron beam and X-ray sources of ionizing radiation. Its proposed capacity was about 1,500 to 1,900 tons of seafood and agricultural products per year.

The irradiator was proposed primarily to: 1) produce irradiated seafood for test marketing, 2) to do research that will pave the way for commercializing the process, and 3) provide assistance in winning FDA approval of irradiated seafood.

Food irradiation proponents proposed this as a research facility. They claimed that the safety problems would not exist because machine (as opposed to isotope) sources of ionizing radiation were proposed. It was ironic, that proponents were capitalizing on messages traditionally used to stop food irradiation by admitting that more research is required and by admitting that cesium-137 has a poor safety record.

SANE/Alaska countered this effort by pointing out that the UAF proposed research to commercialize food irradiation rather than to find answers about health and safety.

Gov. Steve Cowper rejected the proposal due to overwhelming opposition from the seafood industry. Although the UAF study claims that irradiation will expand the markets for Alaskan seafood, the industry did not agree. Governor Cowper characterized industry opposition as virtually unanimous.

The Alaska Seafood Marketing Institute is spending $3.3 million this year in a nationwide marketing campaign that focuses on Alaska's "pure and pristine image." This is the latest phase of a multi-million-dollar marketing and quality control program to rebuild the image of Alaska's seafood. An incidence of botulism poisoning severely hurt the industry about 10 years ago.

The seafood industry is concerned that the proposed irradiator will hurt the public image and marketability of all Alaskan seafood whether it is irradiated or not. Irradiation is inconsistent with a pure and pristine image.

Many of the important markets for Alaskan seafood including Japan, Great Britain, The Scandanavian countries, West Germany, New Zealand, and some states have either banned the sale of irradiated food for public consumption, or halted further applications of irradiated food due to consumer opposition.

Legislators in 10 states are advocating bills to ban the sale of irradiated food. This is happening because the scientific evidence is compelling once you dig into it.

New Jersey's health commissioner, Dr. Molly Coye, opposed such a ban last year. After New Jersey's Assembly overwhelmingly passed a ban, she convinced Gov. Thomas Kean to veto it.

Dr. Piccioni recently met with Dr. Coye to discuss the same scientific evidence used in SANE/Alaska's campaign. After examining this evidence, her position changed. She now supports a two-year ban during which the missing research will hopefully be conducted. Full passage of the New Jersey ban appears certain this year.

The negative response to food irradiation by consumers and the seafood industry is not based on emotional arguments as Mr. Heidersdorf suggested. Rather, it represents a rational response to scientific evidence.

Ed Davis is a professional engineer from Fairbanks who serves as president of SANE/Alaska.

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Friday

Irradiation study puts cart before horse

Guest Opinion

By ED DAVIS

SANE/Alaska's role in stopping the proposed food irradiator requires clarification. A Feb. 21 editorial in the Fairbanks Daily News-Miner portrayed opposition to food irradiation as irrational. This editorial and a Feb. 8 article implied that the questions posed by opponents would have been answered if the "research" facility was built.

We agree that new objective research is required to determine the long-term health effects to irradiated foods. Unfortunately, the UAF proposal excluded studies on health effects. Instead, it only proposed research to help commercialize the process.

This places the cart before the horse. It would have been irrational to let this project proceed without bringing facts such as these before the public:

1) The FDA has failed to produce evidence that refutes in a scientific manner, over 40 studies linking irradiated foods to mutagenic, carcinogenic, and cytotoxic effects.

SANE/Alaska paid to bring an expert on food irradiation research, Dr. Richard Picciono, who has a Ph.D in biophysics, to Alaska to discuss this scientific evidence.

2) Legislators in 10 states are advocating bills to ban the sale of irradiated food. This is happening because the scientific evidence is compelling once you dig into it.

New Jersey's Health Commissioner Dr. Molly Coye opposed such a ban last year. After New Jersey's assembly overwhelmingly passed a ban, she convinced Gov. Thomas Kean to veto it.

Picciono recently met Coye to discuss the same scientific evidence presented in SANE/Alaska's campaign. After examining this evidence, her position changed. She now supports a two-year ban during which the missing research will hopefully be conducted. Full passage of the ban appears certain this year.

3) Revealing quotes were made by Department of Energy officials who lobbied for the program that funded the UAF food irradiation study. One official stated that the success of this program will be measured by "the degree to which this technology is implemented industrially and the subsequent demand created for cesium-137."

Cesium-137 is the most troublesome component in nuclear waste. It comprises just 3 percent of the volume, but emits 50 percent of the heat and 55 percent of the radioactivity in nuclear waste.

4) Alaska's seafood is marketed nationwide by associating our "pure and pristine image" with the quality of our seafood. The seafood industry opposes irradiation because it undermines their primary marketing strategy.

Polls show that very few consumers will knowingly buy irradiated foods. The damage irradiation could impose on Alaska's seafood market is not based on emotionalism or alarmist rhetoric. Rather, it's the public's rational response to UAF, FDA and DOE actions which fail to acknowledge and responsibly address valid concerns such as these.

Governor Cowper was correct in noting that Alaska's market would suffer. The public and the seafood industry do not appreciate being used as guinea pigs.

Ed Davis is president of SANE/Alaska.

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Opinion

Food project a case of misplaced priorities

Celia Hunter

Views expressed here do not necessarily represent those of the Daily News-Miner

Selling government surplus property is a common practice, many times benefiting the average citizen. The surplus disposition unit at 6 Mile Richardson Highway has furnished many an Interior residence, and provided a variety of useful items to enhance living up here in the North country.

However, when the federal government begins to figure out ways to market surplus radioactive materials for uses which place the average citizen at risk, we have a right—indeed a duty—to protest.

One such proposal is the use of surplus Cesium 137, Cobalt 60, and X-rays to irradiate foods to prevent spoilage. This project has aroused intense controversy throughout the United States.

Even though the Federal Drug Administration has stated that the safety of irradiated foods has been demonstrated, opponents of such practices continue to point out that research so far is inadequate and misleading.

The undue haste of the FDA to establish a food irradiation program has resulted in officials failing to investigate the extensive scientific literature which already exists which points out that irradiation may destroy vitamins and other nutrients in foods.

In addition to such losses, research has discovered that irradiation can result in the creation of new, unknown chemicals, known as radiolytic products. Some radiolytic products are known carcinogens, and the consumption of irradiated foods may cause cancer or have other detrimental health effects.

The debate about the safety of irradiation is particularly timely here in Alaska, because Sen. Ted Stevens has intervened to secure a Department of Energy By-products Utilization Program grant for the University of Alaska Fairbanks to participate in the DOE's pilot food irradiation program.

Unfortunately, this grant will not cover studies to determine the potential effects of irradiation of foods on human health and well-being, but will concentrate on determining the feasibility of constructing a food irradiator in Alaska and on the marketing of irradiated seafood products.

This seems like a clear case of misplaced priorities. Until irradiation has obtained a clean bill of health after lengthy and intensive research, it makes little sense to figure out whether contruction of such facilities are viable. It makes even less sense to set up a marketing program, in which the intent is to convince the consumer that "irradiation is good for you."

SANE/Alaska is opposed to studies designed to speed up construction of irradiation facilities and marketing studies for irradiated seafood products until there is conclusive evidence that irradiation offers no hazard to human health.

In line with this policy, SANE/Alaska invited Dr. Richard Piccione, who holds a Ph.D. in biophysics, and is a recognized world authority on food irradiation, to be the featured speaker in a public lecture at the Woods Center Ballroom UAF campus last Saturday.

Another interesting aspect of the DOE sales pitch for radioactive materials is the ongoing crisis at most major nuclear plants operated by the DOE. It is now becoming public knowledge that these plants, many of them constructed in the 1950s are in a deplorable state of repair, with the liklihood of a serious accident occurring at any time.

Carelessness on the part of the operators of these plants has resulted in the release of thousands of tons of radioactive uranium waste into the environment. In the news recently, a congressional inquiry unearthed the information that those in charge of a DOE uranium processing plant at Fernald, Ohio, have known for years that the plant was leaking radioactivity into the air, and contaminating underground water tables with liquid wastes containing unacceptable levels of radioactivity.

Such callousness on the part of DOE administrators from the top down doesn't give their arguments as to the safety of irradiation much credibility. The lack of adequate safety of the entire system of nuclear facilities devoted to weapons material enrichment is a national disgrace.

Cleanup and repairs to existing plants is estimated to cost in the billions. At the same time, the DOE is pressuring for a permit to construct an nuclear enrichment plant west of Idaho Falls, in an area of the state already laced with a huge complex of nuclear facilities.

Idaho residents have organized vociferous opposition to the new plant, pointing out among other things that it will make a mockery of U.S. efforts to scale down the nuclear arms race with the Soviets.

All of these different DOE activities directly affect us as citizens.

Celia Hunter is the creator of Camp Denali, one of the first Alaska wilderness vacation camps, and has been active in the Alaska conservation movement since 1960.

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FISHERMAN'S FORUM

Why Alaska Should Say No To Seafood Irradiation

by Ed Davis

Editor's note: Ed Davis has an MBA and is a professional engineer from Fairbanks, Alaska. He serves as Vice-President of SANE/Alaska. He worked on a shrimp trawler and salmon tender out of Valdez between 1982 and 1985.

Alaska's seafood market survived its first close encounter with food irradiation. On February 7, 1989, Governor Cowper declined Department of Energy (DOE) funding for a food irradiator in Kodiak, Alaska. However, the possibility still remains that a food irradiator will be built for Alaska seafood.

Extensive scientific evidence has linked irradiated foods with a variety of adverse health effects. To protect the seafood markets and public health, a continuing campaign is needed to enact a responsible food irradiation policy.

The Institute of Northern Engineering at the University of Alaska-Fairbanks (UAF) created a statewide controversy over food irradiation with a report issued in December of 1988. It recommended construction of a demonstration seafood irradiator.

By exposing seafood to ionizing radiation, UAF hopes to kill food bacteria and extend shelf life. Irradiation does not make food radioactive.

The proposed facility was relatively small and would have utilized electron beam and X-ray sources of ionizing radiation. Its capacity was 1,500 to 1,900 tons of seafood and agricultural products per year.

It was to be used primarily for: 1) producing irradiated seafood for test marketing, 2) performing research to pave the way for commercializing the process, and 3) providing assistance in winning FDA approval for irradiating seafood.

Threat to AK Seafood Industry

The UAF report claimed that irradiation could expand the markets for Alaska seafood. That claim is debatable.

The Alaska Seafood Marketing Institute is spending $3.3 million this year in a nationwide marketing campaign that focuses on Alaska's "pure and pristine image." This is the latest phase of a multi-million dollar marketing and quality control program to rebuild the image of Alaska's seafood. An incidence of botulism poisoning severely hurt the industry in 1982.

Irradiation opponents are concerned that the proposed irradiator will damage the public image of, and threaten the markets for, all Alaska seafood whether it is irradiated or not. The apple industry's experience with Alar demonstrates that consumers are not willing to buy foods of questionable safety.

A recent poll conducted by Lou Harris for the Food Marketing Institute showed that only 13 percent of American shoppers think irradiated foods are safe. Irradiation is inconsistent with the "pure and pristine image" which is used to sell Alaska seafood.

Many of the important markets for Alaska seafood including Japan, Great Britain, the Scandinavian countries, West Germany, New Zealand, and some states have either banned the sale of irradiated food for public consumption, or halted further applications of irradiated food due to consumer opposition.

Scientific Evidence Justifies Caution

Proponents of food irradiation attribute consumer opposition to emotional and irrational responses to nuclear technology and alarmist rhetoric. To counter these charges, SANE/Alaska spearheaded an educational campaign in conjunction with the seafood industry and various public interest groups.

This effort focused on the scientific, economic, and legal criteria for concerns about food irradiation. An objective review of this information yields compelling and rational justification for opposing food irradiation.

To illustrate the campaign's scientific validity, SANE/Alaska organized an Alaska speaking tour for Dr. Richard Piccioni, an expert on food irradiation research from New York. He has a Ph.D in biophysics.

Dr. Piccioni's research has uncovered 40 scientific studies linking irradiated food with carcinogenic, mutagenic, and cytotoxic effects. These problems arise because new chemicals known as radiolytic products form when a food is exposed to ionizing radiation.

Dr. Piccioni uncovered twelve other studies that verified the production of harmful radiolytic products in irradiated foods. Unfortu-

6—Fairbanks Daily News-Miner, Fairbanks, Alaska, Wednesday, February 8, 1989

State won't seek funding for food irradiation plan

Staff and AP reports

Despite a university report recommending a food irradiation demonstration project in Alaska, Gov. Steve Cowper said Tuesday that the state will not seek federal funding for the plant.

At issue is whether the state should apply for federal funds to build a test facility to expose foods to small doses of radiation to kill bacteria and parasites, Cowper said.

"I don't normally discourage the seeking of information about new techniques," he said. "But I'm convinced that the association of Alaska with food irradiation will have a detrimental effect on Alaska seafood sales."

The state's seafood industry opposes the irradiation project, Cowper said.

At least two commercial fishing groups recently sent letters to Cowper opposing the test use of irradiation in the seafood industry. The Copper River Fishermen's Cooperative and the United Fishermen of Alaska both expressed concern on the potential health risks associated with the process and that many countries already ban the sale of irradiated food products.

The idea also has come under fire from SANE/Alaska, which is questioning the Food and Drug Administration's approval of food irradiation. The federal agency already has approved the use of irradiation in spices, medical supplies and some vegetables.

Ed Davis, president of the group, believes there has been insufficient research on irradiation to prove that it doesn't pose health risks.

The University of Alaska Fairbanks Institute of Northern Engineering recently completed a $400,000 analysis of food irradiation and recommended a test facility in Alaska late in 1988.

William Workman, associate professor of economics and a member of the university research team, said the state's position on the issue could be a "missed opportunity."

He said many of the questions posed by opposing groups would be answered if a research facility was built.

"This isn't an immediate proposal for commercial application," he said. "I don't understand how commercial sales of Alaska seafood could be affected negatively with a research facility in the state."

Supporters of food irradiation say it would extend the shelf-life of food products and would benefit producers and retailers.

Legislation to prohibit the sale of irradiated food in Alaska was considered by lawmakers last year and is under review again this session.

Bills that would ban the sale of irradiated food are being considered in Massachusetts, Vermont, New Hampshire, New York, Pennsylvania, Oregon and Minnesota, according to a SANE/Alaska news release.

Opponents of using radiation to kill food bacteria say the U.S. Food and Drug Administration has not approved the process for wide use and consumers are suspicious of the process.

nately, the FDA used "sleight of hand" arguments to dismiss this evidence during the approval process for food irradiation.

A prime example is a 1976 study by the National Institute of Nutrition (NIN) in India which fed irradiated wheat to malnourished children. This study found that a precancerous chromosomal blood abnormality known as polyploidy increases when malnourished children are fed irradiated wheat. The level of polyploidy returned to normal after irradiated wheat was withdrawn from the diet.

A control group which ate non-irradiated wheat did not suffer increased levels of polyploidy. These results were reconfirmed in a 1986 study. Neither of these NIN studies have been refuted with peer-reviewed scientific research.

Food irradiation proponents attempt to discredit these NIN studies by citing similar research conducted in China which tested healthy male medical students.

This Chinese study is not recognized as peer-reviewed research. It also fails to address the conclusion that children or weakened populations are at risk when consuming irradiated foods. It was highly unprofessional for food irradiation advocates to selectively dismiss scientific studies without solid evidence that irradiation is safe as defined by federal law.

The criteria used by the FDA to prove safety are not reassuring from either scientific, legal, or statistical viewpoints. The FDA's approval is based on five animal feeding studies and a theoretical model. Neither the tests nor the model adhered to the traditional procedures and legal criteria for an FDA approval.

Highly concentrated levels of food additives are normally fed to test animals as part of the FDA's approval process. This testing has yet to be conducted on irradiated foods.

Without concentrating possible carcinogens, animal feeding studies can, at best, only verify that less than one in ten, or perhaps one in a hundred rats, will develop cancer. This is far from the safety level normally used by the FDA which typically requires less than one cancer incidence in a million, or even ten million cases. Further research is clearly required.

UAF presented the seafood irradiator as a research facility. The type of research they proposed however, is not intended to resolve questions about the long-term health effects of irradiated food. UAF chose instead, to place the cart before the horse by only proposing research to help commercialize food irradiation.

Questionable Legal Foundation

The FDA issued approvals in 1986 for the irradiation of fruits, vegetables, pork and spices. This action relied on a relatively new FDA policy known as "de minimis." The policy allows approval of food additives if the FDA determines that cancer risks are very small. By law, food irradiation is treated as a food additive because new chemicals are created in the food.

The FDA's reliance on the de minimis policy ignores a conflicting federal law known as the Delaney Clause. This law requires that a chemical be proven safe before it can be approved as a food additive. It states that "no additive shall be deemed safe if it is found to induce cancer when ingested by man or animal."

When the FDA's approval of certain slightly carcinogenic red food dyes was challenged in a recent court case, the FDA's de minimis policy was found illegal. FDA's approval of food irradiation is highly questionable under the court's interpretation of the Delaney Clause.

Proponents of food irradiation often present the argument that irradiated foods will be labeled and that consumers can choose not to buy them. Although this would be a reasonable approach if labeling were strictly enforced, consumer choice has been and continues to be undermined.

Loopholes already exist in FDA rules that allow foods containing irradiated ingredients and foods from restaurants to be sold without labeling. The FDA's attitude towards providing a real choice for consumers is not reassuring.

Consumer advocates have been forced to wage vigorous campaigns to stop repeated FDA attempts to further undermine labeling requirements. In 1984, the FDA proposed that no labeling should be required on irradiated foods.

> *Through irradiation, the U.S. Dept. of Energy is trying to create a commercial demand for cesium 137, the most troublesome component in nuclear waste. It comprises just 3 percent of the volume, but it emits 50 percent of the heat and 55 percent of the radioactivity in nuclear waste.*

Nuclear Industry Campaign

The primary advocates of food irradiation are the DOE and the nuclear industry's commercial sector. The food industry has reacted cautiously because of consumer opposition.

The underlying reasons for promoting food irradiation are evident in the DOE's testimony at Congressional hearings on the By-products Utilization Program (Now renamed the Advanced Radiation Technology Program. This program funded UAF's $400,000 food irradiation study.) The DOE stated that their strategy is: "to transfer 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."

Cesium 137 is the most troublesome component in nuclear waste. It comprises just 3 percent of the volume, but it emits 50 percent of the heat and 55 percent of the radioactivity in nuclear waste.

Capital costs for electron beam/X-ray facilities exceed, by a factor of at least two, the costs for cesium 137 facilities. The UAF's decision to propose an electron beam/X-ray ionizing radiation source was admirable because it minimizes worker safety and environmental threats. Their decision, however, was not economically justified.

Little incentive will exist for copying the UAF's "admirable" decisions if private investors eventually develop commercial food irradiators. That UAF decision was a luxury made possible by the availability of government research funding.

UAF's proposal uses relatively benign X-ray/electron beam food irradiation technologies to provide a foot in the door for the DOE's ultimate goal; establishing a commercial demand for cesium-137.

Cesium 137 irradiators have a very poor safety record. Many cases are documented where radioactive leaks have contaminated both facilities and workers. The latest accident was discovered on June 6, 1988, at an irradiator owned by Radiation Sterilizers Inc. in Decatur, Georgia.

Several stainless steel capsules containing cesium 137 developed leaks, contaminating the office area, 10 workers, and water in the 25,000 gallon storage tank. Nobody knew how to deal with an accident of this type. It took months just to figure out how to start decontaminating the facility.

New York, New Jersey, and Maine have outlawed the sale of irradiated foods. Legislatures in Alaska and five other states are now considering bills to ban the sale of irradiated food. Responses of this magnitude are generally based on compelling scientific evidence rather than emotionalism.

For example, the Health Commissioner of New Jersey, Dr. Molly Coye, opposed a food irradiation ban last year. After New Jersey's Assembly overwhelmingly passed a ban in 1988, she persuaded Governor Thomas Kean to veto it.

Dr. Piccioni recently met with Dr. Coye to discuss the same scientific evidence that SANE/Alaska used in its public education effort. After examining this evidence, her position changed. She supported the 1989 food irradiation ban signed by Governor Kean.

Alaska's State Legislature is considering a bill (HB-25) which would make the sale of irradiated food illegal in Alaska. It also contains provisions for the Commissioner of the Department of Environmental Conservation to embargo foods that are irradiated.

The bill passed in the State House on March 31, 1989, by a vote of 31-4. Its progress in the Senate was abruptly halted when Sen. Fred Zharoff (D-Kodiak) asked that HB-25 be assigned to a subcommittee consisting of himself. The bill's chances for passage in next year's legislative session are threatened unless Sen. Zharoff releases the bill for further consideration by the Senate.

SANE/Alaska is advocating passage of this bill. Alaska needs a sensible and well defined food irradiation policy which addresses the topics covered in this article.

Without such a policy, private

enteryrise may step in. Governor Cowper's action fell short of precluding this possibility.

Isomedix Inc. and University of Alaska staff members are waging an effort in Juneau to kill HB-25. Isomedix owns more licenses to operate irradiation facilities than any other U.S. firm.

It took an overwhelming display of public opposition to convince Gov. Cowper that the state should stay out of food irradiation. Unless Alaskans continue to press their leaders for passage of HB-25, the market for Alaska seafood may soon face even closer encounters with food irradiation.□

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NOV 25 1990
BURRELLE'S

Irradiation plant worries neighbors

By SALLY HICKS
Times Staff Writer

Next Thanksgiving, Sam Whitney says he will be eating turkey that has been exposed to radiation.

That's a promise that makes some people in the community of Mulberry very, very nervous.

By next year, the businessman expects to have completed the nation's first food irradiator, a $6.4-million plant where fruits, vegetables and poultry will be exposed to gamma rays to kill fruit fly larvae, insects and parasites and to extend shelf life.

The plan has brought this Polk County community of 4,200 people into the center of a bitter international debate over the dangers and possibilities of food irradiation.

After five years of planning and a year of battling with residents, Whitney says he and his backers are nearly ready to make cleaner, longer-lasting food.

Opponents say Whitney's company, Vindicator of Florida, will expose them and the people who eat its products to unnecessary health risks.

"We've got everything from vacuum-packing to freezing and canning that have been around for hundreds of years. Why take the chance?" asked Jan Privett, a special investigator for the Polk County-based Concerned Citizens League of America.

Whitney and about 75 investors began investigating the idea of food irradiation to kill fruit fly larvae when the pesticide EDB was banned.

It seemed a perfect solution for citrus growers looking to market fruit in areas such as Japan and Arizona, which need to protect local growers from the pests.

About a year ago, they settled on a site in Mulberry, about 40 miles east of Tampa on State Road 60.

Opponents jammed City Commission meetings, and national experts traveled to City Hall to testify on both sides. The city's attempt to block the plant failed when a judge overturned a moratorium on such plants; it was approved in September after a commissioner said he received a divine message to vote in favor of it.

Vindicator broke ground Oct. 1 on the plant, a large warehouse where packaged food would be moved through a concrete room with 6-foot-thick walls to be exposed to radiation.

Whitney said construction should be finished by May, and the plant will begin treating food about a month later.

The food, water and building will not become radioactive during the process, said Dan Nash, manager of the state Office of Radiation Control.

"There's a big difference between irradiation and contamination," he said. "I think people are frightened because they don't know the difference."

Irradiation has been approved by the U.S. Food and Drug Administration since 1963. Poultry was added in May to the list of foods that can be irradiated safely.

Groups such as the World Health Organization, the American Medical Association and the U.S. Department of Agriculture have endorsed irradiation, and it is used in more than 30 countries. Astronauts and military personnel have eaten irradiated foods.

In addition to the argument over food safety, opponents also fear that an accident at the plant could expose workers and Mulberry residents to radiation.

But whether irradiation is dangerous could be less critical than whether it's *appetizing*.

Whitney says he is confident that the fruit, vegetable and poultry industry will use his irradiator and that people will buy the products. He predicts the company will gross $2.4-million in its first 12 months of operation and turn a small profit. He estimated the plant will process each year 30-million pounds of strawberries to slow spoilage and up to 40-million pounds of poultry to kill salmonella.

But Quaker Oats, McDonald's Corp., Campbell Soup Co. and many poultry companies have abandoned the process because of fears of a consumer backlash. New York, New Jersey and Maine have banned irradiated food.

One of Florida's largest grocery chains, Publix, already is assuring its customers it won't put irradiated food on its shelves.

Whitney dismisses my questions about the economic success of the business.

"We know there's a market. We're not concerned about Publix. We're convinced they're going to be a fine customer of ours — of the industry."

So why aren't they saying so?

"They'd be crazy to say it because somebody would be over there tomorrow with a sign," he said.

The Star-Ledger
Friday, October 20, 1989

ACTION IN TRENTON

A special section reporting major actions during yesterday's meeting of the State Legislature

Two-year ban on food irradiation passes overwhelmingly in Senate

By MATTHEW REILLY

A bill to place a two-year ban on the use of irradiation to preserve food was approved yesterday by the Senate.

The Senate voted 35-1 to concur with changes in the bill (S-1816) recommended by Gov. Thomas Kean, who conditionally vetoed the original version. The amended bill mirrors legislation enacted recently in New York.

Kean's conditional veto was based on his belief that the issue would be better addressed at the federal level and on the state Health Department's claim that there was insufficient evidence to support a permanent ban.

Senate Minority Leader John Dorsey (R-Morris), the sponsor of the bill, said he is convinced there is enough evidence available on the dangers of food irradiation to warrant a permanent ban.

"I consider a two-year ban to be an effective compromise between the original proposal, which called for a permanent ban, and those who opposed any restrictions on irradiated food," Dorsey said. "A two-year moratorium on irradiation will give the state a good time period to weigh the question of whether irradiation should be banned permanently."

The bill now includes a recommendation by the Governor that the bill contain a "sunset clause" that provides for the expiration of the ban two years after enactment. During that two-year period, the Department of Health would be responsible for concluding toxicological tests to determine the effects of the gamma radiation process.

The moratorium stipulates that food products and fruits and vegetables treated with gamma radiation, a process used to destroy microorganisms, control insects or delay ripening, could not be sold or distributed in New Jersey.

Proponents of the ban maintain that radiation causes chemical changes in the food, including the production of formaldehyde, that can be dangerous to consumers and may cause cancer, birth defects or genetic mutations.

"Aside from the health aspects, questions have been raised as to whether irradiation of food is really necessary at all," Dorsey said. "After all, it destroys nutrients in fruits and vegetables and does not eliminate the need for pesticides."

CORPORATE RESPONSIBILITY

Food Irradiation Process Opposed

By Guy Halverson
Staff writer of The Christian Science Monitor

NEW YORK

PUBLIC interest groups eager to promote "corporate responsibility" are now taking an innovative approach here: They are seeking to limit or curtail certain production processes.

Last month, the Quaker Oats Company announced at its annual meeting that it would no longer irradiate food products or buy irradiated food. That decision followed a campaign by public interest activists who had – among other steps – filed a shareholder's resolution with the Chicago-based food company seeking clarification of Quaker Oat's food preparation policies. Stockholders learned that the company's Golden Grain subsidiary, which makes pasta products, had once used irradiated mushrooms in its food preparation process.

Irradiation is a federally approved production process for vegetables, fruits, nuts, certain meats, flour, and grains that lengthens their shelf life. Some activists dislike the process because it requires that food be exposed to ionizing radiation from cobalt 60 and cesium 137, both radioactive sources.

"When the food is subjected to irradiation, molecules are hit so hard that they break apart; but when they come back together, new chemicals are formed. It is our contention that it is just impossible to determine the safety of these new chemicals at this time," says Christina Roessler, executive director for Food & Water Inc. The non-profit public interest group, based in Denville, N.J., is determined to curb the practice.

To say that Food & Water Inc. has been successful so far may be somewhat of an understatement, according to food industry analysts. Prior to the decision by Quaker Oats to adopt an anti-irradiation policy, H. J. Heinz & Company announced in September that it would adopt an anti-irradiation policy. Another food producer, Ralston-Purina, has agreed that it will announce such a policy at its annual meeting this January, according to Ms. Roessler.

New Jersey's legislature passed a bill earlier this month, just signed into law by Governor Thomas Kean, banning irradiated foods for two years. Several other states, including New York

Quaker Oats, H. J. Heinz, and Ralston-Purina plan to stop irradiating food. New Jersey, New York, and Maine plan to restrict the sale of such food.

and Maine, have either imposed or are considering curbs on the sale of irradiated food.

Currently, Food & Water Inc. is seeking to block the construction of a poultry plant in central Florida that would use irradiation. On the national level, the organization works with such groups as the Interfaith Center on Corporate Responsibility, which is made up of a number of Roman Catholic and Protestant congregations who seek to influence corporations through the corporate shareholder process.

Corporate experts note that while seeking to persuade companies to adopt specific public policy issues is not new – such as asking companies to divest holdings in South Africa, for example – attempting to persuade firms to alter or abolish actual production processes is somewhat unique.

Corporations come under the scrutiny of public interest groups over other issues. On Jan. 9, for example, the Council On Economic Priorities, in cooperation with Ballantine Books, will issue its latest edition of "Shopping For A Better World," a handbook that rates companies on a number of public policy issues. "Some 168 companies will be looked at, including over 1800 brands," according to Alice Tepper Marlin, executive director of the Council.