



Genetic Engineering and Food Irradiation: Evil Twins Threatening Global Food Security

Neither Nutritious Nor Safe

Both genetically engineered and irradiated foods are proven to be nutritionally inferior to unadulterated foods. Genetically engineered (GE) foods have genes from other species added to their genomes, which can negatively alter the nutrient levels. For example, changes in the genetic structure of soybeans can change the way cells produce protein.

Research indicates that irradiated foods have a lower nutritional value than their natural counterparts. For example, irradiation destroys up to 80 percent of vitamin A in eggs and 48 percent of beta carotene in orange juice.¹ Irradiation also produces new chemicals that continue to destroy nutrients during storage and in preparation (see table, below).

The safety of GE foods has never been proven. Instead, scientists rely on a *trust us, we're the experts* attitude. As noted above, new genes in GE foods can

Vitamin B₁ (Thiamine) Loss: Oats²		
	Non-Irradiated	Irradiated
Irradiation	n/a	37%
Storage (12 wks)	0%	18%
Cooking	8%	19%
TOTAL	8%	74%

alter chemical reactions within the cell, leading to the creation of new toxins or allergens.

One example is Monsanto's GE soybeans, which have 26.7 percent more trypsin-inhibitor, a major allergen with anti-nutritional effects.³ GE foods can also contribute to a further increase in antibiotic resistance. In one experiment, plants with antibiotic-resistant genes were grown together with a fungus. The fungus acquired the antibiotic-resistant genes.⁴

Irradiated foods are hardly any safer, considering that it absorbs the equivalent of up to 1 *billion* chest X-rays. Exposure to this high level of energy causes the formation of "unique radiolytic products," many of which do not occur naturally in food.

One such type of radiolytic product, called cyclobutanones, is unique to irradiated food and has been shown to promote cancer development, tumor growth and genetic damage in rats, as well as genetic and cellular damage in human cells.

Other radiolytic products include free radicals, which set off chain reactions in the body that can tear apart cell membranes and make the body more susceptible to cancer, diabetes, heart disease and liver damage. Additionally, chemicals known or suspected to cause cancer and birth defects can be formed in irradiated foods, such as benzene, toluene, and methyl ethyl ketone.

What They Don't Know Won't Hurt Them

The biotech industry that supports genetic modification, and the nuclear industry that supports irradiation, seem determined to make GE and irradiated foods the norm in markets around the world. They consistently oppose the labeling of GE and irradiated foods, which makes it harder for consumers to know what they're eating.

The Codex Alimentarius Commission is the United Nations' body responsible for establishing international food safety standards. In May 1998, under pressure from the biotech industry, it decided that GE food labeling was discriminatory and therefore an illegal trade barrier. The U.S. government, likewise under industry pressure, will not require GE foods to be labeled. The message is clear: *don't ask, because we won't tell.*

Irradiated foods are currently marked with a *radura*, which resembles a blooming flower. This

moderate symbol looks very benign, and to an unaware consumer, could look like a stamp of approval. Consumers are not helped by efforts of the pro-irradiation lobby to call the process “electronic pasteurization” or “cold pasteurization,” innocuous terms for a dangerous process.



The bottom line: government and industry leaders are afraid that an informed public will cut into profit margins. Yet millions of dollars have already been invested in these technologies, and investors certainly will not let their investment fizzle. Where will they turn next?

Onwards — To the Third World

The biotech and nuclear industries have moved south, armed with an alphabet soup of trade agreements, the facade of helping the poor, and the intent to make a profit.

However, their nutritionally inferior harvests will not help a severely malnourished population. The dumping of food aid does nothing to address the underlying causes of hunger, creates further dependence on foreign aid, and forces indigenous populations into tenant farming.

Proponents of GE foods often claim that fortified grains can help treat malnutrition. They tout GE “Golden Rice” as a way to alleviate vitamin A deficiency. What they don’t publicize is that an adult would have to consume 9 kilograms – *nearly 20 pounds* – of rice every day to get the recommended daily intake. Besides, a malnourished body lacks the necessary fat to convert beta-carotene in Golden Rice to vitamin A.

Unquestionably, the irradiation of food causes nutrient loss. To feed nutrient-deficient foods to a population that is already nutrient deficient is illogical and harmful. The food industry is enthusiastic about irradiation because it extends shelf life so food can be shipped greater distances without spoiling – representing major savings for the food industry and allowing consumers in wealthy countries to eat exotic fruits.

However, the percentage of lost vitamins actually *increases* during storage time. Thus, the very way that the industry intends to use irradiation to help nutrient deficient populations will result in nutritionally deficient food. Moreover, the chronically malnourished have lowered resistance to toxins, so irradiated food with its radiolytic products could prove harmful.

GE and irradiated foods promote Third World dependence on large foreign businesses. GE “termina-

tor seeds” produce harvests that will not germinate, meaning every year farmers must repurchase all their seed from a biotech corporation. “Traitor seeds” will not survive without applications of chemicals bought from the same biotech corporation. Genetic engineering is expensive, and farmers will find themselves as tenant farmers on their old land working for the benefit of a foreign company.

Likewise, irradiation is a highly industrialized process that depends on mass production and corporate consolidation to make profits. Since food irradiation doubles or triples shelf life, kills invasive insects, and masks unsanitary industrialized meat production, multinational food corporations can grow more food in the developing world – where labor is cheap and agricultural chemicals are often unregulated. Family farmers cannot compete with corporate factory farms that rely on cheap labor, and their disappearance allows large corporations to gain still more control over the world’s food supply.

In the world of stock prices and profit margins, ideas of quality, safety, sustainability and justice are meaningless. Instead of facing the real reasons for global hunger, biotech and nuclear corporations are forcing dangerous technologies onto the world. Global food security must be protected.

What Can You Do?

- Patronize your local farmer’s market, which will stop waste associated with food transportation.

- Write to your government officials and tell them not to allow food irradiation into your country!

- Contact Public Citizen’s Critical Mass Energy and Environment Program for more information.



Notes

¹ FDA Memorandum, from Kim Morehouse, Ph.D. to William Trotter, Ph.D. April 11, 2000.

² Diehl, J.F. “Combined effects of irradiation, storage and cooking on the Vitamin E and Vitamin B₁ levels of foods.” Presented at the 33rd Annual Meeting of the American Institute of Nutrition, 1969.

³ Klotter, Jule. Organic Consumer’s Association. “Health Concerns of Frankenfoods.” October 1, 2001.

⁴ Hoffmann T., Golz C. and Schieder O. “Foreign DNA sequences are received by *A. niger*...” *Current Genetics*, 27: 70-76, 1994.



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