

Hazards of Genetically Engineered Foods and Crops



Why We Need A Global Moratorium by Ronnie Cummins, Organic Consumers Association



The technology of Genetic Engineering (GE) is the practice of altering or disrupting the genetic blueprints of living organisms—plants, trees, fish, animals, humans, and microorganisms. This technology is wielded by transnational “life science” corporations such as Monsanto and Aventis, who patent these blueprints, and sell the resulting gene-foods, seeds, or other products for profit. Life science corporations proclaim that their new products will make agriculture sustainable, eliminate world hunger, cure disease, and vastly improve public health. However, these gene engineers have made it clear, through their business practices and political lobbying, that they intend to use GE to monopolize the global market for seeds, foods, fiber, and medical products.

GE is a revolutionary new technology that is still in its early experimental stages of development. This technology has the power to break down the natural genetic barriers—not only between species—but between humans, animals, and plants. Randomly inserting together the genes of non-related species—utilizing viruses, antibiotic-resistant genes, and bacteria as vectors, markers, and promoters—permanently alters their genetic codes. The gene-altered organisms that are created pass these genetic changes onto their offspring through heredity. Gene engineers all over the world are now snipping, inserting, recombining, rearranging, editing, and programming genetic material. Animal genes and even human genes are randomly inserted into the chromosomes of plants, fish, and animals, creating heretofore unimaginable transgenic life forms. For the first time in history, transnational biotechnology corporations are becoming the architects and “owners” of life.

With little or no regulatory restraints, labeling requirements, or scientific protocol, bio-engineers have begun creating hundreds of new GE “Frankenfoods” and crops. The research is done with little concern for the human and environmental hazards and the negative socioeconomic impacts on the world’s several billion farmers and rural villagers.

An increasing number of scientists are warning that current gene-splicing techniques are crude, inexact, and unpredictable—and therefore inherently dangerous. Yet, pro-biotech governments and regulatory agencies, led by the US, maintain that GE foods and crops are “substantially equivalent” to conventional foods, and therefore require neither mandatory labeling nor pre-market safety-testing. This Brave New World of Frankenfoods is frightening. There are currently more than four dozen GE foods and crops being grown or sold in the US. These foods and crops are widely dispersed into the food chain and the environment. Over 80 million acres of GE crops are presently under

cultivation in the US, while up to 750,000 dairy cows are being injected regularly with Monsanto’s recombinant Bovine Growth Hormone (rBGH). Most supermarket processed food items now “test positive” for the presence of GE ingredients. In addition, several dozen more GE crops are in the final stages of development and will soon be released into the environment and sold in the marketplace. The “hidden menu” of these unlabeled GE foods and food ingredients in the US now includes soybeans, soy oil, corn, potatoes, squash, canola oil, cottonseed oil, papaya, tomatoes, and dairy products.



GE food and fiber products are inherently unpredictable and dangerous—for humans, for animals, the environment, and for the future of sustainable and organic agriculture. As Dr. Michael Antoniou, a British molecular scientist points out, gene-splicing has already resulted in the “unexpected production of toxic substances... in genetically engineered bacteria, yeast, plants, and animals with the problem remaining undetected until a major health hazard has arisen”. The hazards of GE foods and crops fall into three categories: human health hazards, environmental hazards, and socio-economic hazards. A brief look at the already-proven and likely hazards of GE products provides a convincing argument for why we need a global moratorium on all GE foods and crops.

Toxins & Poisons

GE products clearly have the potential to be toxic and a threat to human health. In 1989, a genetically engineered brand of L-tryptophan, a common dietary supplement, killed 37 Americans. More than 5,000 others were permanently disabled or afflicted with a potentially fatal and painful blood disorder, eosinophilia myalgia syndrome (EMS), before it was recalled by the Food and Drug Administration (FDA). The manufacturer, Showa Denko, Japan's third largest chemical company, had for the first time in 1988–89 used GE bacteria to produce the over-the-counter supplement. It is believed that the bacteria somehow became contaminated during the recombinant DNA process. Showa Denko has paid out over \$2 billion in damages to EMS victims. In 1999, front-page stories in the British press revealed Rowett Institute scientist Dr. Arpad Pusztai's explosive research findings that GE potatoes are poisonous to mammals. These potatoes were spliced with DNA from the snowdrop plant and a commonly used viral promoter, the Cauliflower Mosaic Virus (CaMV). GE snowdrop potatoes were found to be significantly different in chemical composition from regular potatoes, and when fed to lab rats, damaged their vital organs and immune systems. The damage to the rats' stomach linings apparently was a severe viral infection caused by the CaMV viral promoter apparently giving the rats a severe viral infection. Most alarming of all, the CaMV viral promoter is spliced into nearly all GE foods and crops.

Dr. Pusztai's path breaking research work unfortunately remains incomplete. Government funding was cut off and he was fired after he spoke to the media. More and more scientists around the world are warning that genetic manipulation can increase the levels of natural plant toxins or allergens in foods (or create entirely new toxins) in unexpected ways by switching on genes that produce poisons. Since regulatory agencies do not currently require the kind of thorough chemical and feeding tests that Dr. Pusztai was conducting, consumers have now become involuntary guinea pigs in a vast genetic experiment. Dr. Pusztai warns, "Think of William Tell shooting an arrow at a target. Now put a blindfold on the man doing the shooting and that's the reality of the genetic engineer doing a gene insertion".

Increased Cancer Risks

In 1994, the FDA approved the sale of Monsanto's controversial rBGH. This GE hormone is injected into dairy cows to force them to produce more milk. Scientists have warned that significantly higher levels (400-500% or more) of a potent chemical hormone, Insulin-Like Growth Factor (IGF-1), in the milk and dairy products of rBGH injected cows, could pose serious hazards such as human breast, prostate, and colon cancer. A number of studies have shown that humans with elevated levels of IGF-1 in their bodies are much more likely to get cancer. The US Congressional watchdog agency, the GAO, told the FDA not to

approve rBGH. They argued that injecting the cows with rBGH caused higher rates of udder infections requiring increased antibiotic treatment. The increased use of antibiotics poses an unacceptable risk for public health. In 1998, Monsanto/FDA documents that had previously been withheld, were released by government scientists in Canada showing damage to laboratory rats fed dosages of rBGH. Significant infiltration of rBGH into the prostate of the rats as well as thyroid cysts indicated potential cancer hazards from the drug. Subsequently, the government of Canada banned rBGH in early 1999. The European Union (EU) has had a ban in place since 1994. Although rBGH continues to be injected into 10% of all US dairy cows, no other industrialized country has legalized its use. The GATT Codex Alimentarius, a United Nations food standards body, has refused to certify that rBGH is safe.

Food Allergies

In 1996, a major GE food disaster was narrowly averted when Nebraska researchers learned that a Brazil nut gene spliced into soybeans could induce potentially fatal allergies in people sensitive to Brazil nuts. Animal tests of these Brazil nut-spliced soybeans had turned up negative. People with food allergies (which currently afflicts 8% of all American children), whose symptoms can range from mild unpleasantness to sudden death, may likely be harmed by exposure to foreign proteins spliced into common food products. Since humans have never before eaten most of the foreign proteins now being gene-spliced into foods, stringent pre-market safety-testing (including long-term animal feeding and volunteer human feeding studies) is necessary in order to prevent a future public health disaster. Mandatory labeling is also necessary so that



those suffering from food allergies can avoid hazardous GE foods and so that public health officials can trace allergens back to their source when GE-induced food allergies break out.

In fall 2001, public interest groups, including Friends of the Earth and the Organic Consumers Association, revealed that lab tests indicated that an illegal and likely allergenic variety of GE, BT-spliced corn called StarLink, had been detected in Kraft Taco Bell shells, as well as many other brand name products. The StarLink controversy generated massive media coverage and resulted in the recall of hundreds of millions of dollars of food products and seeds.

Damage to Food Quality & Nutrition

A 1999 study by Dr. Marc Lappe published in the *Journal of Medicinal Food* found that concentrations of beneficial phytoestrogen compounds thought to protect against heart disease and cancer were lower in GE soybeans than in traditional strains. These and other studies, including Dr. Pusztai's, indicate that GE food will likely result in foods lower in quality and nutrition. For example, the milk from cows injected with rBGH contains higher levels of pus, bacteria, and fat.

Antibiotic Resistance

When gene engineers splice a foreign gene into a plant or microbe, they often link it to another gene, called an antibiotic resistance marker gene (ARM), that helps determine if the first gene was successfully spliced into the host organism. Some researchers warn that these arm genes might unexpectedly recombine with disease-causing bacteria or microbes in the environment or in the guts of animals or people who eat GE food. These new combinations may be contributing to the growing public health danger of antibiotic resistance—of infections that cannot be cured with traditional antibiotics, for example new strains of salmonella, e-coli, campylobacter, and enterococci. German researchers have found antibiotic resistant bacteria in the guts of bees feeding on gene-altered rapeseed (canola) plants. EU authorities are currently considering a ban on all GE foods containing antibiotic resistant marker genes.

Increased Pesticide Residues

Contrary to biotech industry propaganda, recent studies have found that US farmers growing GE crops are using just as many toxic pesticides and herbicides as conventional farmers and in some cases are using more. Crops genetically engineered to be herbicide-resistant account for almost 80% of all GE crops planted in 2000. The “benefits” of these herbicide-resistant crops are that farmers can spray as much of a particular herbicide on their crops as they want—killing the weeds without damaging their crop. Scientists estimate that herbicide-resistant crops planted around the globe will triple the amount of toxic broad-spectrum herbicides used in agriculture. These broad-spectrum herbicides are designed to literally kill everything green. The leaders in biotechnology are the same giant chemical companies—Monsanto, DuPont, Aventis, and Syngenta (the merger between Novartis and Astra-Zeneca)—that sell toxic pesticides. The same companies that create the herbicide resistant GE plants are also selling the herbicides. The farmers are then paying for more herbicide treatment from the same companies that sold them the herbicide resistant GE seeds.



Genetic Pollution

“Genetic pollution” and collateral damage from GE field crops already have begun to wreak environmental havoc. Wind, rain, birds, bees, and insect pollinators have begun carrying genetically-altered pollen into adjoining fields, polluting the DNA of crops of organic and non-GE farmers. An organic farm in Texas has been contaminated with genetic drift from GE crops grown on a nearby farm. EU regulators are considering setting an “allowable limit” for genetic contamination of non-GE foods, because they don’t believe genetic pollution can be controlled.

Because they are alive, gene-altered crops are inherently more unpredictable than chemical pollutants—they can reproduce, migrate, and mutate. Once released, it is virtually impossible to recall GE organisms back to the laboratory or the field.

Damage to Beneficial Insects and Soil Fertility

In 1999, Cornell University researchers made a startling discovery. They found that pollen from GE Bt corn was poisonous to Monarch butterflies. The study adds to a growing body of evidence that GE crops are adversely affecting a number of beneficial insects, including ladybugs and lacewings, as well as beneficial soil microorganisms, bees, and possibly birds.

Creation of GE “Superweeds” and “Superpests”

Genetically engineering crops to be herbicide-resistant or to produce their own pesticide presents dangerous problems. Pests and weeds will inevitably emerge that are pesticide or herbicide-resistant, which means that stronger, more toxic chemicals will be needed to get rid of the pests. Herbicide resistant “superweeds” are already emerging. GE crops such as rapeseed (canola) have spread their herbicide-resistance traits to related weeds such as wild mustard plants. Lab and field tests also indicate that common plant pests such as cotton bollworms, living under constant pressure from GE crops, will soon evolve into “superpests” completely immune to Bt sprays and other environmentally sustainable biopesticides. This will present a serious danger for organic and sustainable farmers whose biological pest management practices will be unable to cope with increasing numbers of superpests and superweeds.

New Viruses and Pathogens

Gene-splicing will inevitably result in unanticipated outcomes and dangerous surprises that damage plants and the environment. Several years ago, researchers conducting experiments at Michigan State University found that genetically altering plants to resist viruses can cause the viruses to mutate into new, more virulent forms. Scientists in

Oregon found that a GE soil microorganism, *Klebsiella planticola*, completely killed essential soil nutrients. Environmental Protection Agency whistle blowers issued similar warnings in 1997 protesting government approval of a GE soil bacterium called *Rhizobium melitoli*.

Genetic “Bio-Invasion”

By virtue of their “superior” genes, some GE plants and animals will inevitably run amok, overpowering wild species in the same way that exotic species, such as kudzu vine and Dutch elm disease have created problems when introduced in North America. What will happen to wild fish and marine species, for example, when scientists release into the environment carp, salmon, and trout that are twice as large, and eat twice as much food, as their wild counterparts?

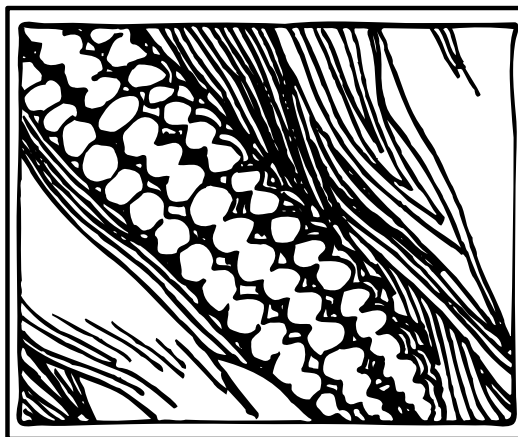
Socioeconomic Hazards

The patenting of GE foods and widespread biotech food production threatens to eliminate farming as it has been practiced for 12,000 years. GE patents such as the Terminator Technology

will render seeds infertile and force hundreds of millions of farmers who now save and share their seeds to purchase evermore-expensive GE seeds and chemical inputs from a handful of global biotech/seed monopolies. If the trend is not stopped, the patenting of transgenic plants and food-producing animals will soon lead to universal “bioserfdom” in which farmers will lease their plants and animals from biotech conglomerates such as Monsanto and pay royalties on seeds and offspring. Family and indigenous farmers will be driven off the land and consumers’ food choices will be dictated by a cartel of transnational corporations. Rural communities will be devastated. Hundreds of millions of farmers and agricultural workers worldwide will lose their livelihoods.

Ethical Hazards

The genetic engineering and patenting of animals reduces living beings to the status of manufactured products. A purely reductionist science, biotechnology reduces all life to bits of information (genetic code) that can be arranged and re-arranged at whim. Stripped of their integrity and sacred qualities, animals that are merely objects to their “inventors” will be treated as such. Currently, hundreds of GE “freak” animals are awaiting patent approval from the federal government. One can only wonder, after the wholesale gene altering and patenting of animals, will GE “designer babies” be next?



What Can You Do?

Guidelines for Local Grassroots Action

Campaign Goals: As the anti-GE campaign in Europe has shown, mass grassroots action is the key to stopping this technology and moving agriculture in an organic and sustainable direction. The OCA advocates the following Food Agenda 2000-2010 as the foundation for our local-to-global campaign work:

- **A Global Moratorium** on all Genetically Engineered Foods and Crops. These products have not been proven safe for human health and the environment and they must be taken off the market.
- **Stop Factory Farming.** Begin the phase-out of industrial agriculture and factory farming—with a goal of significantly reducing the use of toxic chemicals and animal drugs on conventional farms by the year 2010. This phase-out will include a ban on the most dangerous farm chemicals and animal feed additives (antibiotics, hormones, and rendered animal protein) as well as the implementation of intensive

Integrated Pest Management Practices (decrease the use of toxic pesticides and chemical fertilizers through natural composting, crop rotation, cover crops, use of beneficial insects, etc.).

- **Convert American Agriculture** to at least 30% organic by the year 2010. We demand government funding and implementation of transition to organic programs so that at least 30% of US agriculture is organic by the year 2010—with a strong emphasis on production for local and regional markets by small and medium-sized organic farmers.

Take Action in Your Community

- Circulate our Food Agenda 2000-2010 petition to identify as many people as possible who support our campaign. We will include these names in our local databases for two-way communication and mobilization.

- Help us find retail stores and co-ops that will circulate our petitions and other materials, which can all be downloaded from our website.

- Tell your friends and family about our free electronic newsletter, *BioDemocracy News*.

- Tune in to our OCA web site for regular news, updates, and Action Alerts: www.organicconsumers.org

- Organize forums, protests, and news-making events.

- Pressure elected public officials, political candidates, and regulatory agencies both locally and nationally, to demand either an outright GE moratorium or comprehensive

mandatory labeling, stringent pre-market safety-testing and long-term liability insurance for all GE food and fiber products.

- Contact us and support this campaign by sending a tax-deductible donation and/or volunteer to help with grass roots organizing:

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or make your donation via the website at:

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