

Genetically Modified Foods: Biotech Dream or Nightmare?

The scientific techniques of producing genetically modified (GM) foods first began to emerge in the early 1980s. These foods are engineered for a variety of reasons. Many are made to produce their own pest-killing toxins, to reduce the need to apply chemical pesticides; some are designed to survive the application of herbicides, while others have their genes spliced to insure a longer shelf life (Fain, 2000). The biotech industry that produces these foods has made all kinds of promises about their effects. GM foods, they say, will save the environment, improve human health and solve world hunger. The public is expected to believe this new technology can solve innumerable social, economic and ecological problems based solely on the word of industry executives and their government counterparts.

If these promises sound familiar, they should. Similar claims were made when chemical pesticides, herbicides and fertilizers were first brought onto the market, and sometimes by the same companies. But in time it was learned that these chemicals did as much to deplete the soil and poison the ecosystem as they did to improve yields. As new technologies were introduced it became harder for small farmers to survive in a market now controlled almost entirely by agribusiness giants. Ironically, the boldest and most repeated claim of the industry today is that GM foods will help undo the damage caused by this last technological advance, reducing our dependence on toxic herbicides and pesticides (Brown, 2001).

Many previous technologies have turned out to have adverse effects not foreseen by industry or government. Chlorofluorocarbons punched a hole in the ozone layer. The widespread use of fossil fuels has given us the greenhouse effect. Nuclear energy was supposed

to be the cleanest, safest energy ever used. Today governments and community activists are struggling to determine how to deal with that industries toxic legacy.

US Regulations Weak

It would be foolish for us to rely, once again, on the promises of corporate leaders and allow them to keep introducing new technologies without thorough public and scientific review. Yet, this is exactly what has been done with GM foods. In 1992 the FDA agreed with the biotech industry that genetically modified foods are not significantly different from traditional foods, and allowed them to start marketing them without even labeling them as having been genetically modified (Fain, 2000). In fact, the FDA's process for approval of new GM foods is entirely voluntary (www.fda.gov).

Recent studies by the National Academy of Sciences and the Union of Concerned Scientists have criticized the extremely lax US regulatory structure (UCS). Studies are usually done only by the company that stands to make a profit and are rarely published for review by scientific peers or the public (Fain, 2000). The FDA has not required a single food-safety test (Fain, 2000) and the EPA has never required an Environmental Impact Statement (UCS).

Potential Dangers of GM Foods

Critics of GM foods have cited many reasons to be wary of this new technology. One worry is that a few large agribusiness corporations will eventually control the vast majority of the world's food supply. The human health concerns include the introduction of new allergens

into the food supply, the use of antibiotic-resistant genes as ‘markers’ in the process of developing most GM foods, the production of new toxins and the concentration of toxic metals in plants designed to remove heavy metals from the soil (UCS). Threats to the environment include gene transfer to wild or weedy plants, changing patterns in the use of herbicides, poisoning of wildlife and the creation of new viruses (UCS). It is extremely unlikely that all risks to humans and the environment have been identified. With any new technology, our ability to imagine what might go wrong is limited by our understanding of the technology (UCS). Biotechnology tampers with the genetic makeup of living organisms, a process so complex we are only beginning to scratch the surface.

New Studies

Biotech and agribusiness companies were allowed to introduce GM foods onto the market without answering, or even asking many of the questions that should be posed. Of the 1.8 billion dollars spent by the USDA on biotech research, only 1% has been used for risk assessment (UCS). As a result, long term studies of environmental consequences, human health dangers and socioeconomic consequences are only beginning to be completed, after years of regular consumption of GM foods in the US. Recently published studies do little to allay the concerns of GM critics, more often than not reconfirming the dangers those critics have warned the public about.

Environmental Effects

A three year Farm Scale Evaluation recently completed in the UK examined the environmental effects of three GM crops – oilseed rape, beet and maize. Researchers found a significant impact on wildlife. Plants that provide important food sources for birds, butterflies and other animals were far less plentiful in and around the fields planted with GM crops, as opposed to conventional crops. The amount of seeds available to farmland animals was one reduced by two thirds in beet fields and four fifths in oilseed rape fields. Only in the case of maize did researchers find more diversity in GM fields, but this result was criticized for two reasons. First, the study did not include crop yield as a factor, providing an unreliable picture. And secondly, the conventional fields of maize were treated with the herbicide atrazine, which was banned by the UK right as the study was released. (Ching, 2004)

The study was considered flawed from the beginning by GM critics. It did not consider the many other questions regarding environmental safety, including gene flow, transgenic contamination and impact on soils (Ching, 2004). By ignoring crop yields the study allowed fields of GM crops to be managed with less chemical herbicides than would normally be used to grow the same crops commercially. The fields used in the study may not be economically viable. “...a set of trials designed to show GM in a good light have had a dramatic negative impact,” was the response of Charlie Kronick of Greenpeace (Coghlan, 2003).

Health Threats

Even more recently, studies conducted by Dr. Terje Traavik, at the Norwegian Institute of Gene Ecology, have highlighted the dangers to human health posed by GM foods. Traavik found that Bt-maize, engineered to include the pest killing Bt toxin, may have triggered reactions

in people living near the GM maize crops in the Philippines, triggering fevers, respiratory illnesses and skin reactions (Vidal, 2004). When villagers left the area their symptoms disappeared, but flared up again when they returned (Aglionby, 2004). Blood samples from 39 people showed increased levels of three antibodies, interpreted as evidence of a reaction to the Bt toxin (Reuters, 2004).

Dr. Traavik also carried out studies that show the cauliflower mosaic virus (CaMV) promoter was found intact in rat tissues after a single meal, and was also confirmed to be active in human cells. The CaMV promoter is attached to inserted foreign genes in nearly all GM foods. GM foods advocates have previously claimed that the CaMV promoter would only activate the gene to which it was attached, is plant specific and will not function in mammals and will not transfer from food to internal organs. Dr. Traavik's research has contradicted each of these claims. Some scientists worry that the promoter might create a growth factor that could result in a cancerous condition. (Traavik, 2004)

Bio Containment, or the Lack Thereof

Based on the studies cited above, it is safe to assume the ecological and human health risks of GM foods may be much more serious than their corporate backers have led us to believe. Today almost 170 million acres of GM crops are being grown around the world, mostly in the US, Canada, China, South Africa, Argentina and Brazil (Lamb, 2004). There are several GM products already on the market in these and other countries and many more being developed. The ability of the biotech industry to contain these foods and their seeds is questionable as well.

Through lax regulation and government oversight, the genie may already be out of the bottle, so to speak. Putting it back in again may prove to be difficult.

The inability of the biotech industry to contain GM crops has already been illustrated, when GM maize began showing up in Mexico, despite a Mexican government ban (Dalton, 2001). More recent studies have also indicated genes from the GM corn may be infecting the DNA of native corn in Mexico (Weissert, 2004). Another example was that of Starlink corn, a GM corn that was approved for livestock, but not for human consumption. Shortly after its introduction onto the market, Starlink began showing up in taco shells and other foods, causing recalls and other disruptions to farmers and a decline in corn exports (Pollack, 2001).

Now a new report from the Union of Concerned Scientists shows that traditional corn, soybean and canola seeds in the US have small percentages of genetically modified seeds in them. “There is no reason to believe that the transgenes detected in this study are the only ones moving into the traditional seed supply,” concludes the report, which also points out GM crops not approved for human consumption have been and continue to be field tested, creating the possibility of additional seed contamination. Jane Rissler, co-author of the study points out that with corn, for example, the possibility of gene flow from one variety to another is high because “corn pollen can travel so far.” (Lamb, 2004)

GM Crops in the Third World

Another promise held out by the biotech industry is that new GM foods open up the possibility of rejuvenating the economies of underdeveloped, agriculturally based countries and alleviating problems of world hunger. This claim is scoffed at by those familiar with the

problems of hunger in the third world, who understand these problems have little to do with food availability and are caused more by economic disparities and global politics. Ethiopia, for instance, was exporting grains to pay off the national debt throughout the crisis of famine in the 1980s. In the 1990s the worst example of hunger and malnutrition was found in Iraq, a direct result of the US sanctions and embargo against that country.

Another recently completed study of the effects of GM crops in Africa, this one by the Third World Network, underscores these claims. The findings reveal that GM crops do not offer any answers to soil fertility, resistance to genes by pests and other problems faced by farmers. It is also clear that biotechnology is not the answer to corruption, declining commodity prices, inequality in land distribution and ownership, income disparities, and armed conflicts, which are the major causes of poverty and hunger in Africa. (deGrassi, 2003)

In Argentina, the introduction of GM foods has had devastating ecological, health and socioeconomic consequences. Argentina was once known as the grain barn of the world, which produced a surplus of varied and healthy food to feed eight times its population. Today many foods have to be imported and hunger and extreme poverty are common sights. Agriculture is dominated almost entirely by the production of Roundup Ready Soya, smaller farmers have been unable to compete and over 500 rural towns have disappeared as farmers were pushed off the land and into the cities.

Use of the herbicide glyphosate increased from 28 million liters to over 100 million in the last few years. Resistant weeds have emerged and thousands of hectares of forest have been cut down. The chemicals used to treat the crops are often sprayed from airplanes leading to wide scale ecological devastation. Studies from a maternity hospital in Buenos Aires found pesticide residue in the breast milk of over 90% of the patients. Farmers have lost access to the seeds; tens

of thousands went into debt trying to keep up. Food prices have increased and today 54% of Argentina lives below the poverty line.

Conclusions

Many questions have still not been answered about GM foods, and many have yet to be asked. To allow these foods onto the market and into the fields without having conducted studies about their effects on both human health and the environment was reckless and short sighted. To offer them as a panacea to the problem of world hunger is deceptive. Governments around the world should rein in the biotech industry before it is too late, before all of our traditional crops are contaminated. Stronger regulations, labeling of GM foods and serious testing are the least we should expect. Until these standards are in place, GM foods should be kept off of our dinner plates and in the laboratory.

The incredible potential of biotechnology to transform the world we live in, in unimaginable ways, should also cause concern about the way crucial decisions are made in our current economic and political system. Corporate elites, in bed with government regulators, decide the scope and direction of science and technology with no input from the vast majority of people whose lives, ecosystems, food and well-being are threatened to be disrupted by the effects. A better system would be one that puts the people in charge. Democratic control of industry and technology would assure us that even when bad decisions are made, they will be made by us. And the criteria for making these decisions would not be based solely on private profit, but on the common good.

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